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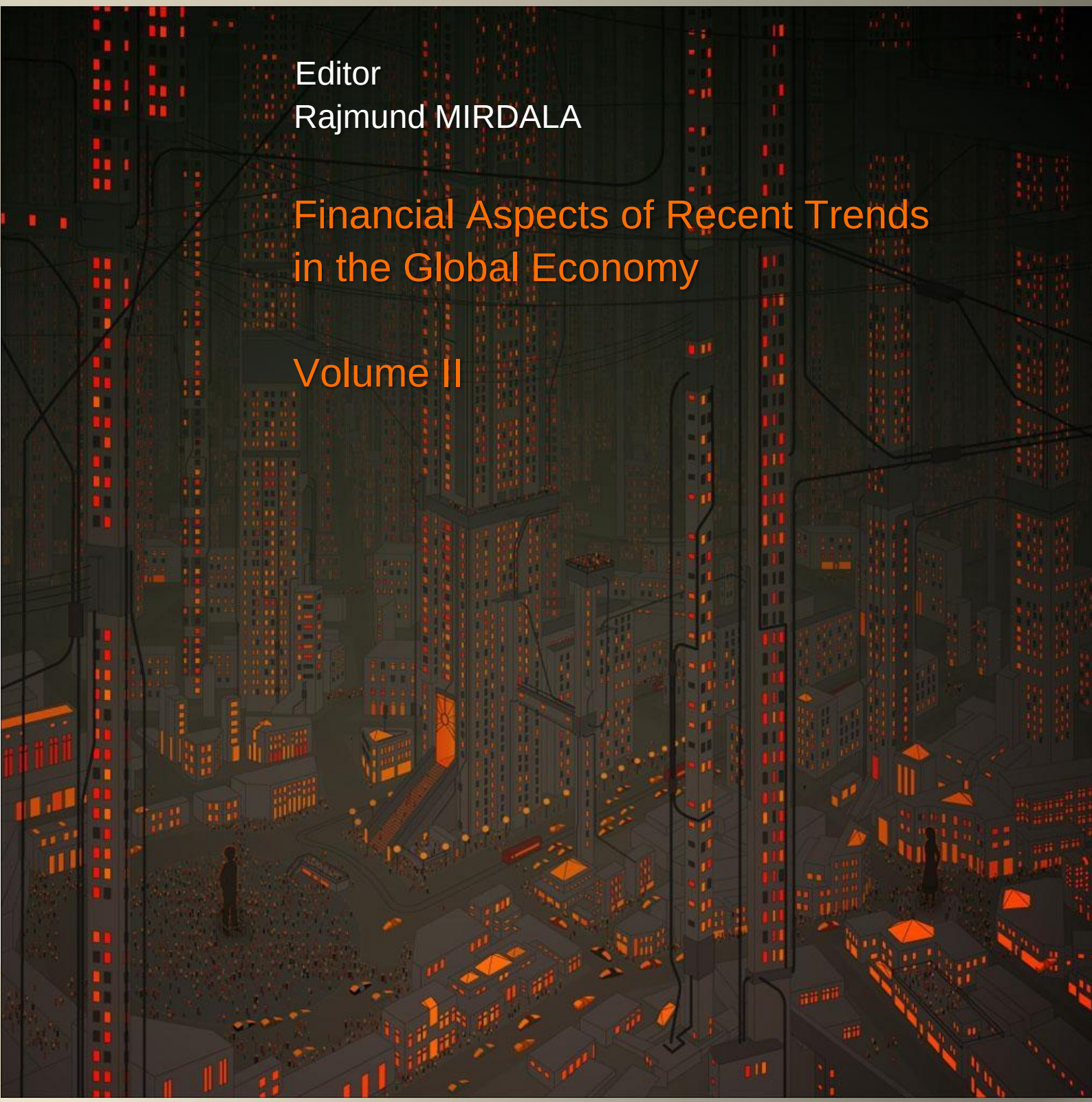

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Financial Aspects of Recent Trends in the Global Economy

Volume II

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Financial Aspects of Recent Trends in the Global Economy (FINART) Volume II

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IV. Eurozone Perspectives

From the Editor

Current global financial and economic crisis represents one of the key areas of policy makers as well as academics discussions. Together with debt crisis they may be considered as one of the most crucial challenges that official authorities are facing over the past few decades. Crisis period focused attention of economists to various areas of the financial aspects of recent trends in the world economy in the new global era.

Financial liberalization together with the process of growing financial integration among countries in global content significantly contributed to rapid increase in the financial dependence of national financial markets. Intensification and internationalization of financial transactions, financial innovations and rising strength of financial institutions accelerated growing potential of the financial sector. It is not surprising that nowadays daily turnover in financial transactions significantly exceeds daily turnover in trade all over the world. As a result overall impact of financial sector activities on the real economy markedly increased over last few decades. Finally, a rising demand for more effective regulation of national financial sectors and international financial transactions seems to be a convenient way that policymakers suggest as the appropriate solution for current global financial challenges. Within this context we also point to an increasing relevancy of voices calling for new arrangement of international monetary system.

Increased uncertainty considerably reduced allocation effectiveness of the financial markets during the crisis period. While the interest rates during the recession period generally decreased, costs of lending increased mostly for highly indebted countries. Economic crisis emphasized another crucial aspect of the current development in the world economy generally known as debt financing of economic growth and related negative trend in public debt development. Particular problems in the most indebted Eurozone countries affected not only stability of the euro exchange rate but also became the main reason for accelerating the process of fiscal unification, banking union formation and key adjustments in Eurozone stabilization mechanisms. As a result the pressures to strengthen financial discipline of the Eurozone member countries increased while the alternative scenarios of Eurozone reconstruction remained still alive (i.e. national bankruptcy, fiscal union).

Another problem partially related to the current debt crisis represents a significant growth of the corporate debt, also known as corporate funding crisis. Accumulation of corporate debt during last few decades together with slow post crisis recovery in the main world economy centers raises the risk of upcoming corporate insolvency wave as a result of the huge wall of maturing debt signalizing refinancing difficulties in credit markets in United States, Europe and Asia.

The last problem we emphasize as a direct consequence of negative aspects of the current crisis period is related to the rising indebtedness of households. In many countries an individual insolvency still deserves not sufficient attention of official authorities. Personal bankruptcy as a complex consolidation procedure is also not adequately implemented in the national legislation especially in the less developed countries considering wide aspects of this process.

In the global era soundness financial sector and financial discipline of agents (governments, investors, households) represents one of the key aspects of generally expected positive outcomes of economic and financial globalization. Sustainable economic growth of the global economy is necessarily

conditional to positive contributions of the financial sector development as well as the financial discipline of agents to the real performance of economies.

Thus, the goal of this book - **Fin**ancial **A**spects of the **R**ecent **T**rends in the Global Economy (FINART) - is to encourage the exchange of new ideas about challenges in global trends in finance in the view of wide aspects of current financial and (public, corporate, households) debt crisis. The book consists of 29 chapters that are organized in 4 blocks - *Economic and Financial Crisis (Issues and Challenges)* and *Global Imbalances, Debt Constrains and Exchange Rates Arrangements* are included in the Volume I of the book; *Financial Markets (Risks and Solutions)* and *Eurozone Perspectives* are included in the Volume II of the book.

Block III - *Global Imbalances, Debt Constrains and Exchange Rates Arrangements* - begins with chapter *On the Co-movements of Exchange Rates* by Itir Ozer-Imer and Ibrahim Ozkan. Their chapter assesses exchange rate co-movements by grouping the currencies based on similarities in their patterns, and emphasizes the importance of the trajectories of exchange rate co-movements in the exchange rate classification. Hierarchical clustering is performed with some widely used similarity measures along with the longest common subsequence (LCS) algorithm. Weekly series of twenty-one currencies were used in this study. The results show that; i) LCS performs better than the other measures and it produces comprehensible results, ii) historical and geographical factors play an important role in the co-movements of currencies. Co-movements (common trajectories) of currencies need to be taken into consideration in studies on exchange rate behavior; since these trajectories usually contain most of the information. This chapter has important implications for the analyses in the research areas of exchange rate regime choice, monetary policy implementation, and the optimum currency areas (OCA) theory.

Chapter 2 - *Collateral Composition, Diversification Risk, and Systemically Important Merchant Banks* - by Alexis Derviz*,* deals with impact of collateral diversification by non-financial firms on systemic risk in a general equilibrium model with standard production functions and mixed debt-equity financing. Systemic risk comes about as soon as firms diversify their collateral by holding claims on a big wholesale (merchant) bank whose asset side includes claims on the same producer set. The merchant bank sector proves to be fragile (has a short distance to default) regardless of competition. In this setting, the policy response consisting in official guarantees for the merchant bank liabilities entails considerable government loss risk. An alternative without the need of public sector involvement is to encourage systemically important merchant banks to introduce a simple bail-in mechanism by restricting their liabilities to contingent convertible bonds. This direction of regulatory policies can be particularly relevant for containment of systemic events in globally leveraged economies serviced by big international banks outside the host country regulatory control.

Chapter 3 - *Reform of Existing and Building of New Institutional Structure Over the Counter Financial Derivatives Market* - by Dragan Miodrag Momirović*,* aims to show in main aspects a new regulatory and supervisory structure of OTC financial derivatives markets, their structure, differences, practical's and policies implications and problems of application on the basis of the initiative group G20 and other relevant international organs regulations. The financial crisis which occurred during 2008 has shown that markets are OTC (over-the-counter) derivatives unregulated and insufficiently

controlled and represent a potential source of systemic risk build up. At summits in Pittsburgh G20 leaders by made binding recommendations for the reform of the existing buildings and the new institutional structure of OTC financial derivatives market. Recommendations are relating to the standardizations of contracts, mandatory central clearing of all transactions, trading across exchanges or electronic platforms, capital and margin requirements and reporting through trades repositories.

Chapter 4 - *Financial Markets Prudential Regulation as a Dynamic Self-Corrective Process* - by Josef Mládek, studies the issues of economic and financial cycle and their interconnections. In this vein of research, risk-based prudential regulation of financial markets is of center importance. This chapter is therefore structured as follows. First, it highlights some specific features of prudential regulation in the financial markets. It looks at a different nature of the regulated risk in financial markets compared with other sectors of the economy and the consequences thereof for the robustness of the regulation. Related to that, effort of the regulated entities to optimize the impact of regulation on them is investigated. Finally, lessons learned are applied to shed some more light on the prospects of regulatory reform in order to achieve more viable and robust risk regulation of financial markets.

Chapter 5 - *Global and Regional Regulatory Changes to the Financial Industry as a Consequence of the Financial Crisis: The Case of the European Union* - by Roberto J. Santillán-Salgado, briefly discusses the antecedents of Financial Regulation in the European Union, as well as the political and institutional responses of governments to the Financial Crisis of 2007-2009. As a result of author's critical analysis, we conclude there is no doubt of the interest of national authorities to minimize the probability of a repetition of a systemic financial stress episode or, worse yet, another fully fledged financial crisis; but the challenge to conciliate so many legislations, political interests and economic interests is not a trivial matter. While the discussion about the origins and consequences of the recent Financial Crisis will be an ongoing topic for many years to come, a number of national governments, regulatory agencies and international financial organizations, have already taken important steps and towards the implementation of new regulatory frameworks, as well as more robust supervision mechanisms of the financial industry.

Chapter 6 - *Mark to Market Accounting as a Magnifier of Financial Crises* - by Nemanja Milovan Stanisic, Snezana Drago Popovcic-Avric, Vule Miroljub Mizdrakovic and Marina Milan Djenic, provides an analysis on whether mark-to-market accounting magnifies financial crises. Even though the results of numerous studies on this topic offer various conclusions, the majority of them conclude that fair value accounting, or mark-to-market accounting, does not cause financial crises. Most studies that had similar conclusions dealt with the 2006-2008 period, whereas we focus our research on period from 1881 to present day. Primarily, authors will point out the historical context of the implementation of mark-to-market accounting and consequences it had. Authors consider the long term relationship between United States (US) GDP and the S&P 500 index values and key historical developments to conclude that implementation of mark-to-market accounting contributes to creating of asset bubbles and assets overestimations. Even though mark-to-market accounting does not cause financial crises, it does magnify fundamental procyclicality which is inherent in efficient markets.

Chapter 7 - *Market Timing Ability of Socially Responsible Investing Funds in Luxembourg* - by Wei Rong Ang and Hooi Hooi Lean, investigates the market timing ability of SRI funds in Luxembourg.

Luxembourg is the largest fund investment center in Europe and played an important role in promoting SRI funds. This study uses data from Eurekahedge database for 188 SRI funds in Luxembourg for the sample period of January 2001 to December 2011. Authors employed two market timing models, i.e. the four-factor Treynor-Mazuy (1966) model and Henriksson-Merton (1981) model for the analysis. Authors found that the SRI fund managers in Luxembourg are skillful. In other words, they are good in forecasting the market trends. Moreover, there is no size and momentum effects found but value effect is existed. Authors also found that the SRI funds have higher return during the financial crisis. Hence, authors suggest that the SRI funds can be used as a hedging instrument during the crisis.

Chapter 8 - *The Market of High Risk Financial Services* - by Jacek Binda and Paweł Mrowiec*,* analyses of the market of high risk financial services, the reasons of its fast growth as well as supervisory activities undertaken by Polish Financial Supervision Authority (KNF) related to this phenomenon. The black list of entities which do not hold a permission to render bank services, especially such as receiving money deposits in order to charge them with risk, is getting longer and longer. In the end of November the list, prepared by Polish Financial Supervision Authority (KNF) had 33 entries, which constitutes a 43% increase compared to the end of September. The reason for this may be the introduction by KNF of tightened criteria for loan availability in the form of T recommendation. Implementation of T recommendation shifted the demand for bank services towards non-bank entities.

Block IV - *Financial Markets (Risks and Solutions)* - begins with chapter 9 - *The Crisis of Euro's Governance: Institutional Aspects and Policy Issues* - by Daniele Schilirò. Her chapter discusses the issue concerning rules and discretion in the governance of the euro. In the following section it describes the euro crisis and examines the remedies put in place, noting that despite the statements and the efforts of the European authorities the confidence in the euro is diminishing. Thus the exit of Greece from the euro or even the breakdown of the single currency has become a hypothesis discussed more frequently among economists, politicians, central bankers and businessmen. The last section of the chapter focuses on what's wrong in the governance of the euro and examines the institutional aspects and the economic policy issues suggesting that the European integration allows to ensure the European citizens independence and protect their historical freedom, but also to influence and thus affect the choices from which may depend the future prosperity of European nations involved.

Chapter 10 - *Monetary Union and the Role of the Monetary Policy from the Point of View of Selected Theoretical Approaches* - by Rastislav Kotulič, Jaroslava Hečková and Alexandra Chapčáková*,* provides a brief overview of key milestones in the process of the European monetary integration. We also evaluate positive and negative aspects of this process in the view of selected theoretical approaches. The effective international monetary system is an important precondition to a successful fulfillment of international economic transactions. The existing development of international monetary systems indicates the need of one strong currency, at most a small number of national currencies to ensure international transactions. It has to be a currency (currencies) that would be based on a strong national economy, especially in the current period that is marked by the strengthening of the long duration of international economic transactions. The instability of the national

currency that would take place of the international (world) currency is connected to depreciative as well as revaluation processes, which does not contribute to the development of the world economy.

Chapter 11 - *Forced Changes in Banks Financing Growth in East European Countries* - by Nebojsa Savic, Goran Pitic and Lidija Barjaktarovic, analyzes causes of changes of importance of various foreign sources of financing in the analyzed period. The need to analyze CBCs, in particular, was derived from the fact that they represented the largest source used by banks to grant credit. In this regard, authors analyzed especially the levels of deposit and lending interest rates, and their structures. The experience during the Great Recession shows that excessive reliance on foreign capital inflows makes a country vulnerable.

Chapter 12 - *Fiscal Policy and External Constraint in the European Monetary Union* - by Rosaria Rita Canale, puts in doubt this conclusion and connects fiscal crises with the balance of payments. A stylized model is presented. Its results are: 1) public expenditure can have positive effects not only on growth but also on deficit and debt if it is not accompanied by an a interest rate increase by the Central Bank; 2) when an external constraint is introduced fiscal policy can have negative effects if it comes with a balance of payment deficit. The same negative effects result from whatever shock causing negative expectation about the future growth of the national economy. The results suggest that to make a currency union work it is necessary to overcome national boundaries.

Chapter 13 - *Determinants of Fiscal Consolidation Success in V4 Countries* - by Radovan Dráb and Lucia Mihóková, focuses on the identification and comparison of revenue and expenditure based consolidation, which would substantially contribute to the reduction of public debt in the V4 countries for the period 1996 to 2014. This analysis was performed in several stages. The first part focuses on the determination of the debt accumulation and debt reduction periods by using year-on-year comparisons with a debt-to-GDP ratio indicator. The second part of the analysis was focused on model specification based on theoretical and empirical evidence in order to identify factors, which in related periods influenced the major part of debt reduction and debt accumulation in Visegrad countries. The probability of success in fiscal consolidation described in the last part has been derived based on a logistic probabilistic model with two different equations for revenue and expenditure consolidation.

Chapter 14 - *Developments in Models of Majority Voting over Fixed Income Taxations* - by Cristian Marius Litan, Paula Curt and Diana Andrada Filip, focuses on several aims: 1. Authors discussed how standard equilibrium concepts from simple majority voting games in coalitional form (e.g. core, ε-core and least core) can be adapted to the general setup of voting over income tax schedules, as well as the conditions under which such adapted concepts are stable. 2. Authors investigated which are the implications of these concepts, from the perspective of progressivity versus regressivity, for workhorse models of the positive theory of income taxation (e.g. with restricted policy spaces such as quadratic taxation models, piecewise linear taxation models, etc.). Finally, authors provided a brief critical evaluation of the extent to which this approach is able to address the difficulties acknowledged by the literature in the field and we draw future lines of investigation.

Rajmund Mirdala

III.

Financial Markets (Risks and Solutions)

Chapter 1

ON THE CO-MOVEMENTS OF EXCHANGE RATES

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ON THE CO-MOVEMENTS OF EXCHANGE RATES

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Abstract

The aims of this study are to assess exchange rate co-movements by grouping the currencies based on similarities in their patterns, and to emphasize the importance of the trajectories of exchange rate co-movements in the exchange rate classification. Hierarchical clustering is performed with some widely used similarity measures along with the longest common subsequence (LCS) algorithm. Weekly series of twenty-one currencies were used in this study. The results show that; i) LCS performs better than the other measures and it produces comprehensible results, ii) historical and geographical factors play an important role in the co-movement of currencies. Co-movements (common trajectories) of currencies need to be taken into consideration in studies on exchange rate behavior; since these trajectories usually contain most of the information. This chapter has important implications for the analyses in the research areas of exchange rate regime choice, monetary policy implementation, and the optimum currency areas (OCA) theory.

Keywords: co-movements, exchange rate patterns, exchange rate classification, clustering, longest common subsequence.

1.1 Introduction

The need to understand the behavior of exchange rates has generated a vast empirical literature. Despite this vast literature, many issues remain unsolved even though it has been a popular area of research. Exchange rate behavior is important from the viewpoint of international finance, exchange rate regime classification and the optimum currency areas (OCA) theory.

The empirical literature on the choice of exchange rate regimes has been mostly based on the International Monetary Fund's (IMF) *de jure* classification of exchange rate regimes until 1999.[3] The IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* took into consideration the officially announced regimes of the countries. Provision of a comprehensive set of countries, frequent update and historical data extending back to 1970 were the key advantages of this classification (Bubula and Otker-Robe, 2002).

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[2] Ibrahim Ozkan, Associate Professor at Hacettepe University, Faculty of Economics and Administrative Sciences, Department of Economics, 06800, Beytepe, Ankara, Turkey
[3] As Frankel (1999: 3-5) has put forward there is a continuum of flexibility from the most rigid to free floating; currency union, currency board, "truly fixed" exchange rate, adjustable peg, crawling peg, basket peg, target zone or band, managed (dirty) float, and free float.

It has been observed that there had been divergences between the officially reported and actual exchange rate regime arrangements (Calvo and Reinhart, 2002). Some countries which reported pegged exchange rate regimes to the IMF were either unable or unwilling to keep the exchange rate pegged. Some other countries, despite official commitment to flexible exchange rates, intervened in the foreign exchange markets to limit movements of the exchange rates because of the fear of floating (Calvo and Reinhart, 2002). *De jure* classification failed to reflect the actual monetary autonomy of the regimes because the grouping of pegs had different degrees of flexibilities. Hence, IMF itself adopted a new classification based on *de facto* classification in 1999, while a new empirical literature based on *de facto* classification was emerging. Despite being an improvement, this system lacked a historical database.

The empirical literature on the classification of exchange rates does not constitute a unified structure, however, the following studies can be emphasized in a selective manner.[4] In an effort to extend the time period backwards, Bubula and Otker-Robe (2002) constructed a monthly database on *de facto* regimes by including all IMF member countries from 1990 to the beginning of 2001, whereas Reinhart and Rogoff's (2004) database contains 153 countries' monthly data from 1946 to 2001. Levy-Yeyati and Sturzenegger's (2005) *de facto* classification covered all IMF-reporting countries from 1974 to 2000. They classified exchange rate regimes on the basis of changes in the nominal exchange rates, the volatility of these changes, and the volatility of international reserves. Eichengreen and Razo-Garcia (2011) considered the Bubula-Otker-Robe (BOR), Reinhart-Rogoff (RAR) and Levy-Yeyati-Sturzenegger (LYS) classifications to analyze disagreements over these three classifications and showed that the disagreements are most prevalent in middle and low-income countries. Ghosh *et al.* (2011) used the classification data covering the period between 1980 and 2010 for 145 emerging and developing countries to analyze and compare the inflation performance of countries under *de jure* and *de facto* pegs.

There is no consensus in the literature with regard to the robustness of regime comparisons since "sample periods, data frequency, conditioning variables, definitions of regimes, empirical methodologies used to classify regimes, the level of details in the regime classification, the kinds of countries included in the sample, the influence of shocks on the outcomes, and the treatment of endogeneity" (Tavlas *et al.*, 2008: 961) differ in these studies. The aim of our study is neither constructing *de jure* or *de facto* classification nor testing a theory, but is rather to assess exchange rate patterns and behavior based on an *atheoretical* methodology, which is closer to human perception, and hence, which is understandable. We believe that the trajectories of exchange rate co-movements are vital phenomena for the classification of exchange rates since these trajectories contain most of the information.

If the currencies of countries move together, then those countries would become good candidates for pegging their currencies and forming an optimum currency area (OCA). Although our study allows for a special classification to analyze natural candidates for the OCAs, we did not conduct the analysis from the viewpoint of the OCA theory. Instead, this study explores the natural clusters of currencies by taking into account their co-movements.

[4] For a survey of the empirical literature on the classification of exchange rates see Tavlas et al. (2008).

Although there is a diversified literature on co-movement, there is no common understanding of this phenomenon (Hochstotter and Weskamp, 2012: 3). In this study, co-movement is defined as the similarity of the exchange rate trajectories. Similarity is measured based on common patterns in exchange rates since co-movement creates common patterns. Two different lines of research can be distinguished in the co-movement studies; *i)* co-movement studies related with the field of finance; financial assets/markets, asset prices or their returns (Bonfiglioli and Favero, 2005; Connolly *et al.*, 2007; Ammer *et al.*, 2011), *ii)* co-movement studies related with the foreign exchange markets. Co-movement studies in this second category have usually been conducted with emphasis on co-movement between exchange rates and financial assets/markets (Hochstotter and Weskamp, 2012), and exchange rates and some economic fundamentals, such as interest rate (Takagi, 1991; Sanchez, 2006), oil price (Buetzer *et al.*, 2012; Reboredo, 2012), etc. To our knowledge, research on the co-movement of exchanges rates is a relatively intact area. Among those few, some employed pattern recognition (Huang, 2011), while some considered the foreign exchange markets as networks **(**Fenn *et al.*, 2012; Sharif *et al.*, 2012). Most of the analyses on exchange rate co-movement have used correlation (Benediktsdottir and Scotti, 2009; Li, 2011; Wu *et al.*, 2012; Fen *et al.*, 2012; Sharif *et al.*, 2012).

Since exchange rates constitute the largest asset class in the world (Galati and Melvin, 2004; Hochstotter and Weskamp, 2012), their behavior can be understood just like any other financial asset. In fact, two currencies can be treated as the same asset if they are co-integrated (Kuhl, 2008). With an attempt to explore the behavior of exchange rates, our study aims; i) to examine whether exchange rates have some common patterns, ii) to observe the natural groups of currencies based on common patterns and iii) to link the natural group of currencies with the exchange rate classifications in the literature. Since we seek to introduce a novel approach for this assessment in a fully reproducible way[5], the currency data in the sample have been obtained from the open access database of Federal Reserve Economic Data (FRED)[6] and the statistical software used in the study is an open source program called R.[7]

To assess the common patterns in exchange rates, we employed longest common subsequence (LCS) algorithm. Some other quantitative similarity measures, such as correlation, brownian distance correlation, euclidian distance, mutual information, Kolmogorov-Smirnov (KS) test and maximal information have also been used to measure similarities. We formed clusters based on these similarities with an application of hierarchical clustering. We then compared findings and observed that LCS performs better than the other commonly employed measures. It was seen that LCS is very suitable for sequence interdependence or trajectory similarity and a very short discussion is given in section 1.2.2. We confirmed our results with the annual reports of the Bank for International Settlements (BIS). Finally, we compared the natural clusters found in this study with the exchange rate classifications in the literature.

We believe the LCS technique employed in this study is very valuable for analyzing the co-movements of exchange rates and exchange rate regimes, which are of great importance for the international monetary arrangements, financial integration, and financial deepening.

[5] The R-scripts necessary to reproduce the analysis are given in Appendix F.
[6] http://research.stlouisfed.org/fred2/.
[7] For details see http://cran.r-project.org/.

1.2 Data and methodology

1.2.1 Data

We downloaded the exchange rates data from the database of FRED with the R program script in order to obtain fully reproducible results. Countries and regions (currencies) in the sample are the European Union (the Euro-EU), Brazil (Brazilian real-BZ), Mexico (Mexican peso-MX), South Africa (South African rand-SF), Malaysia (Malaysian ringgit-MA), India (Indian rupee-IN), Australia (Australian dollar-AL), New Zealand (New Zealand dollar-NZ), Canada (Canadian dollar-CA), the United Kingdom (Pound sterling-UK), Switzerland (Swiss franc-SZ), Japan (Japanese yen-JP), Norway (Norwegian krone-NO), Denmark (Danish krone-DN), Sweden (Swedish krona-SD), Hong Kong (Hong Kong dollar-HK), Singapore (Singapore dollar-SI), Taiwan (new Taiwan dollar-TA), Korea (the won-KO), Thailand (Thai baht-TH) and Venezuela (Venezuelan bolivar-VZ).[8] VZ has been included in the sample to serve as the control series. We downloaded the exchange rates for the time span of their availability and August 10, 2012. We based our analysis on weekly observations. In addition to these currencies, FRED database also comprises Chinese Yuan (a pegged exchange rate) and Sri Lankan Rupees. We excluded China and Sri Lanka from our analysis. The reason for the inclusion of the other currencies in the sample from the FRED's database is to obtain results which are easy to follow and fully reproducible.Table 1.1 shows the descriptive statistics of the data set.

Table 1.1 Descriptive statistics of weekly exchange rate data set[9]

	Start	End	Min	Max	Mean	Median	St. Dev.
CA	1/4/71	8/10/12	0.93	1.61	1.22	1.20	0.17
BZ	1/2/95	8/10/12	0.83	3.93	1.93	1.85	0.67
DN	1/4/71	8/10/12	4.69	12.37	6.69	6.30	1.33
HK	1/5/81	8/10/12	5.13	8.70	7.64	7.77	0.48
IN	1/8/73	8/10/12	7.22	57.13	26.72	28.45	15.95
JP	1/4/71	8/10/12	76.10	358.29	168.38	131.92	74.56
MA	1/4/71	8/10/12	2.10	4.66	2.89	2.67	0.56
MX	11/8/93	8/10/12	3.10	15.41	9.87	10.32	2.51
NO	1/4/71	8/10/12	4.66	9.84	6.59	6.54	1.04
SI	1/5/81	8/10/12	1.20	2.30	1.74	1.71	0.28
SF	1/4/71	8/10/12	0.67	12.05	3.77	2.78	2.86
KO	4/13/81	8/10/12	668.60	1790.00	947.41	884.20	213.17
SD	1/4/71	8/10/12	3.87	11.03	6.63	6.71	1.59
SZ	1/4/71	8/10/12	0.76	4.32	1.77	1.53	0.72
TA	10/3/83	8/10/12	24.60	40.57	31.18	31.47	4.14
TH	1/5/81	8/10/12	20.36	56.10	30.65	26.39	7.06
AL	1/4/71	8/10/12	0.67	2.07	1.22	1.27	0.30
EU	1/4/99	8/10/12	0.63	1.20	0.85	0.80	0.15
NZ	1/4/71	8/10/12	0.67	2.53	1.48	1.51	0.42
UK	1/4/71	8/10/12	0.38	0.95	0.58	0.60	0.09
VZ	1/2/95	8/10/12	0.17	4.30	1.70	1.60	1.28

[8] http://research.stlouisfed.org/fred2/categories/94.

[9] For the scatter graph and the correlation values of the currencies in our sample, see Appendix A.

The descriptive statistics of the data exhibit different characteristics. In general, scaling (transforming the variables so that they have zero means and unity variances) is a choice before proceeding Since the currencies are treated as financial assets, we obtained return series for all currencies, c_i as $ret_{i,t} = \ln(c_t) - \ln(c_{t-1})$, which also remove any constant and linear trend in mean for all similarity measures except LCS. LCS is flexible enough for this type of data set since it checks the convexity (concavity) of trajectories.

1.2.2 Methodology

The approach to find the interdependencies between exchange rates follows three steps; (i) obtaining a matrix that represent the degree of associations, (ii) simply applying hierarchical clustering algorithm to get the cluster dendrogram that shows clustered structure of exchange rates, and (iii) assessing the clusters based on the BIS reports.

The interdependencies between time series can be measured by means of similarity/ dissimilarity measures. There are several measures suggested in the literature. In this study, correlation, euclidian distance, brownian distance correlation, maximal information, mutual information, Kolmogorov-Smirnov (KS) test and the longest common subsequence (LCS) have been employed. Among these, correlation and euclidian distance are the most widely used measures. Brownian distance correlation and maximal information have been developed and suggested very recently. Since the mutual information is a measure for nonlinear correlations, it is suitable for the type of analysis conducted in this study. K-S test is one of the widely used nonparametric tests to compare the cumulative probability function to assess whether random variables are drawn from the same probability distribution function. Hence, it is a suitable measure to assess the cumulative distribution functions of return series. Finally, LCS is a measure that is used to match the sequences successfully regardless of the nature of the data.

Correlation

The correlation between two random variables *X* and *Y* is given as:

$$corr(X,Y) = \frac{cov(X,Y)}{\sqrt{var(X)var(Y)}} \tag{1.1}$$

and $-1 \le corr(X,Y) \le 1$

Distance correlation (Brownian distance correlation)

Distance correlation is a new approach in testing the dependence of random vectors (Szekely *et al.*., 2007; Szekely and Rizzo, 2009 and 2010). The distance correlation between random vectors *X* and *Y* with finite first moments is the nonnegative number *R(X,Y)* defined by

$$R^2(X,Y) = \begin{cases} \dfrac{V^2(X,Y)}{\sqrt{V^2(X)V^2(Y)}} & V^2(X)V^2(Y) > 0 \\ 0 & V^2(X)V^2(Y) = 0 \end{cases} \tag{1.2}$$

where the distance covariance between random vectors *X* and *Y* with finite first moments is the nonnegative number $V^2(X,Y)$ given as;

$$V^2(X,Y) = \left\| f_{X,Y}(t,s) - f_X(t) f_Y(s) \right\|^2 = \frac{1}{c_p c_q} \int_{\Re^{p+q}} \frac{\left| f_{X,Y}(t,s) - f_X(t) f_Y(s) \right|^2}{|t|_p^{1+p} |s|_q^{1+q}} dtds \tag{1.3}$$

and distance variance is similarly the square root of $V^2(X,X)$ or;

$$V^2(X) = V^2(X,X) = \left\| f_{X,X}(t,s) - f_X(t) f_X(s) \right\|^2 \tag{1.4}$$

The maximal information coefficient (MIC)

Recently, maximal information coefficient has been proposed to measure associations in variables by Reshef *et al.* (2011). If there is a relationship between two variables, then a grid can be formed that partitions the data to encapsulate this relationship. In other words, a grid is drawn on the *x-y* axis so that the maximum mutual information is obtained. In order to compute this, algorithm first searches all possible grids applied to the data to obtain the maximum normalized mutual information. The characteristic matrix defined as $M = (m_{x,y})$, where $m_{x,y} = \frac{\max\{IG\}}{\log(\min\{x,y\})}$ is calculated for every *x-y* grids (pairs) such that $xy < n^{0.6}$, and *IG* is the information gain, *n* is the sample length. Then, the statistic *MIC* is set to the maximum value in the characteristic matrix *M*.

Authors show that as sample size grows, the probability approaches to one that MIC assigns a score that tends to; i) one for larger class of noiseless functional relationship and ii) zero to statistically independent variables. In other words, if random variable *Y,* which is a function of random variable *X,* is not constant in an open interval, then MIC assigns a score that tends to one as sample size grows. For a noisy function, the performance of MIC is bounded by its R^2.

Simon and Tibshirani (2012) addressed some performance issues and compared the power of the maximal information measure with the brownian distance correlation and put forward that maximal information performs well with some functional forms, whereas distance correlation performs better with some other functional forms. Hence, we found appropriate to include both distances in our analysis.

Euclidian distance

The Euclidian distance is probably one of the most widely used measures. The Euclidian distance between two vector values x_i and y_i is given as:

$$d_E = (x_i, y_i) = \sqrt{(x_i - y_i)^T (x_i - y_i)} \tag{1.5}$$

Euclidian distance is calculated by one-to-one matching of the observations and hence one cannot take into account the nonlinear delays between pairs.

Mutual information

Mutual information has been defined closely as a measure of (nonlinear) dependency. Some examples are; indicator of relevance (Cover and Thomas, 1991), a measure for mutual dependence (Li, 1990), a measure of independence, which is sensitive to both correlated and non-correlated dependencies (Kraskov *et al.*, 2004), a measure that enables us to detect nonlinear dependence (Suzuki *et al.*, 2009).

Mutual information is defined as

$$I(X,F)=H(X)-H(X\mid F) \tag{1.6}$$

where *X* and *F* are two random variables and *H* is Shannon's entropy function (Shannon, 1948), which is given as

$$H(X)=-\sum_{i=1}^{nc}P(x_i)\log(P(x_i)) \tag{1.7}$$

and conditional entropy is given as

$$H(X\mid F)=-\sum_{j=1}^{nf}P(f_j)\left(\sum_{i=1}^{nc}P(x_i\mid f_j)\log(P(x_i\mid f_j))\right) \tag{1.8}$$

where *P(.)* is a probability function. This measure can be interpreted as a real valued function that measures the reduction of uncertainty associated with random variable *X* when a new random variable *F* is available. Since conditional entropy is less than or equal to unconditional entropy, this measure is always greater than or equal to zero. Mutual information is calculated as zero when *F* does not contain information about *X*.

Mutual information measures nonlinear correlations but it needs to tie timely observations to each other, and it ignores delayed dependency.

Kolmogorov-Smirnov test (KS test)

Kolmogorov-Smirnov test is a non-parametric statistical test, which is used to determine whether two probability distributions follow the same distribution. More formally, the null hypothesis, H_o, of two samples is withdrawn from the same distribution and is tested against the alternative.

$$H_0 : F_i = F_j \tag{1.9}$$

where F_i and F_j are empirical cumulative distribution functions defined as $F(x)=\frac{1}{n}\sum_{i=1}^{n}I_{X_i<x}$, *n* is the sample size, $I_{X_i\le x}=1$ if $X_i \le x$ and $I_{X_i\le x}=0$ otherwise. *KS* test is performed based on the *D*-statistics, which is defined as the absolute value of the maximum difference between two empirical cumulative functions:

$$D=\sup_X\left|F_i-F_j\right| \tag{1.10}$$

Kolmogorov (1938) showed that for the larger value of *D*, the null hypothesis is rejected. He provided the critical values. The *p*-values associated with this test are used as a similarity measure for the exchange rate return distributions.

Longest common subsequence (LCS)

There are several high level representations suggested in the literature to improve the quality of the measures in general. Examples are the fourier transform (representing time series with best 5-10 frequencies), wavelets (to capture time-frequency space properties), eigenwaves and local polynomial models. A good hierarchy for time series representation is given in Lin *et al.* (2007). One can find simple explanatory examples of how some quantitative measures fail to capture the similarity between time series in the literature (see Hoppner, 2002a and Jachner *et al.*, 2007). Therefore, capturing the similarities as humans do is also a central work for many knowledge discovery algorithms. Hoppner (2002b) suggests three steps to analyze interdependencies. First step is labeling (or describing "convex", "concave", "convex-concave", "concave-convex") numerical values. Next step is finding the patterns and the last step is deriving rules about pattern dependencies.

One can convert time series to symbolic level and analyze both frequent and infrequent patterns with the LCS. LCS in general is used to find similar common patterns within symbolic data. However, it is adapted to find the common patterns of real valued sequences as well. Due to the properties of exchange rate data, the similarity measure should be robust to noise, support elastic and imprecise matches. Both dynamic time warping (DTW) and LCS has these characteristics (Vlachos *et al.*, 2003). However, LCS is very robust and performs better than the euclidian, correlation and DTW (Vlachos *et al.*, 2002), specifically in noisy environment. Hence, DTW is not included in this study.

LCS is a subsequence, *S*, of the maximal length between two strings, say A and B. Let, $S = s_1, s_2, ..., s_p$ is a subsequence of both $A = a_1, a_2, ..., a_n$ and $B = b_1, b_2, ..., b_m$, where $p \prec m \leq n$. Then the mappings are defined as $F_A : \{1,2,..., p\} \rightarrow \{1,2,..., n\}$ and $F_B : \{1,2,..., p\} \rightarrow \{1,2,..., m\}$ such that $F_A(i) = j$ if $s_i = a_j$, (similarly $F_B(i) = j$ if $s_i = b_j$) and mapping functions are monotone strictly increasing (Hirschberg, 1977). It is then easy to compute the similarity between two strings directly related with the length of LCS. The degree of similarity is increasing with the length of LCS.

In order to obtain LCSs of exchange rate series, "*qualV*" package of R program is used.[10] If two series have no common patterns, the distance value is calculated as one and if two series are exactly equal or one time series contain exactly the other, then this value is calculated as zero.[11]

1.3 Results

Figure 1.1 shows the cluster dendrogram for LCS.[12]

[10] http://www.jstatsoft.org/v22/i08/.

[11] See table B1 in Appendix B for LCS distances.
For an example of the matching of two time series, see Appendix C.

[12] In order to check the robustness of our results, we repeated the algorithm for weekly exchange rate series by KS statistic, distance correlation, correlation, mutual information, maximal information, and euclidian measures. These are given in figures D1 and D2 in Appendix D.

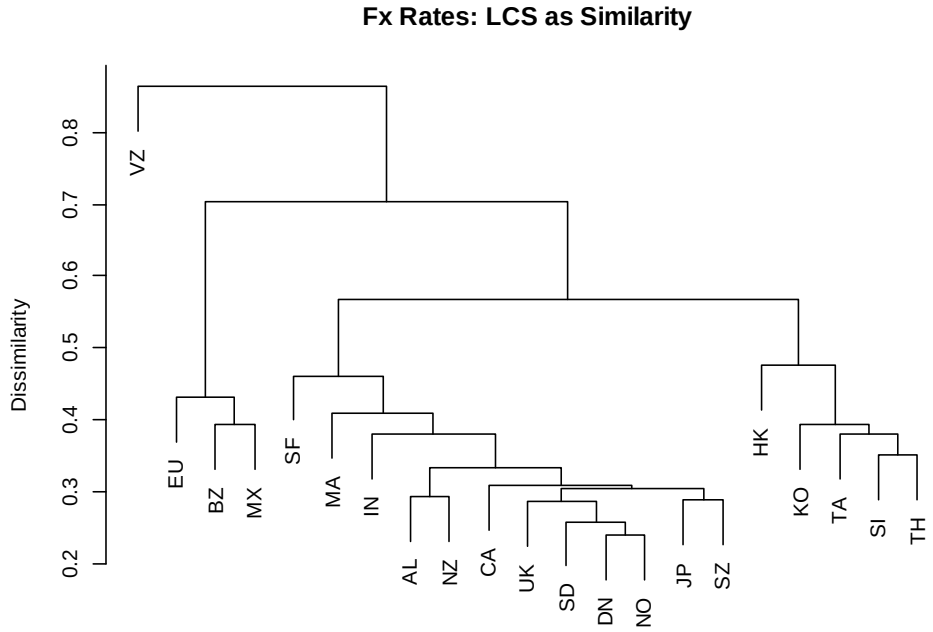

Figure 1.1 Weekly exchange rates cluster dendrogram for LCS measure

1- NO (Norwegian krone), DN (Danish krone) and SD (Swedish krona) form the first group that is tied with high similarities (with 0.24-0.26 distance values).[13] These countries formed the Scandinavian Monetary Union in the past. This result shows that market still treats these currencies as if they are very similar.

2- AL (Australian dollar), NZ (New Zealand dolar) and CA (Canadian dolar) together with the UK (British Pound) are behaving similarly. These countries were part of the Dominion of the British Empire. These are also the commonwealth countries. This is an example of how historical ties play an important role in exchange rate co-movements. In addition, IN (Indian rupee), MA (Malaysian ringgit) and SF (South African Rand) behave similar with these currencies. Taking into consideration the fact that India, Malaysia and South Africa were under the hegemony of the British Empire in history, this result exhibits a strong evidence of historical ties.

3- HK (Hong Kong dollar), SI (Singapore dollar), TA (New Taiwan dollar), KO (South Korean Won) and TH (Thai Baht) fit in the same group. Geographical proximity seems to be an important factor for the similar pattern in their exchange rates although there had been European influence in the region in history.

4- BZ (Brazilian real) and MX (Mexican peso) exchange rates have strong similarities. These are both developing countries in Latin America. Interestingly, Euro shares similar exchange rate dynamics with these currencies. Euro is behaving quite different than the Scandinavian currencies and the British pound. This may explain why the UK, Denmark and Sweden used the opt-out provision from the Economic and Monetary Union (EMU).

5- Another interesting similar exchange rate co-movement appears to be the SZ (Swiss franc) and JP (Japanese yen). Historically, SZ was regarded as safe haven currency. Although JP has not been

[13] In order to check whether we can measure those values even though the processes are random walks, we performed a simulation for different sequence lengths. The result of this simulation together with a short discussion of our LCS results is given in Appendix E.

regarded as a safe haven, both currencies are subject to carry trades (Bank for International Settlements-BIS, 2003)[14].

The comparison of the results obtained by LCS distance with those of the widely used similarity measures clearly shows that LCS produces much better clusters. A brief summary of those results is as follows:

1- The cluster dendrogram of KS statistic does not make sense, i.e., CA and SI are grouped together, whereas MX and UK seem to be behaving similarly. It is safe to state that since KS statistic does not take the time into account, it may not produce sensible results for behavior of time varying currencies.

2- AL and NZ behave similarly in distance correlation, correlation, mutual information, maximal information and euclidian dendrograms. However, AL, NZ, CA and UK were the part of the Dominion of the British Empire and this group of currencies is not identified as co-moving in the results obtained by these similarity measures as in the case of LCS.

3- Although the behavior of NO, DN and SD are similar in the correlation and euclidian dendrograms as in the case of the LCS dendrogram, other findings of these measures are less reasonable compared to the LCS results. For example, it is hard to explain why NO and MX, and BZ and DN seem to co-move in the mutual information dendrogram. NO and SD behave similarly, DN is close to this group and it moves closely with SZ in distance correlation and maximal information dendrograms. Again, when other groups in these measures are taken into consideration, it is observed that LCS results make more sense compared to these measures.

4- The interdependence between IN, MA and SF is not clearly visible in the findings of these measures. As an illustrative example, MA and VZ seem to be behaving similarly in the maximal information dendrogram, and although IN is close to this group, it moves on its own, whereas SF is not close to this group.

5- In the dendrograms of all these measures, the co-movement of HK, SI, TA, KO, and TH based on geographical proximity is not observed as precisely as in the LCS dendrogram. Although TA, KO and TH seem to be behaving similarly in the results obtained by the distance correlation and euclidian measures, HK is dissimilar to this group and SI seems to co-move with the EU in distance correlation dendrogram, whereas HK and BZ, and SI and EU form other groups in the euclidian dendrogram.

6- BZ and MX behave similarly in distance correlation, correlation and maximal information dendrograms, whereas MX and NO, and BZ and DN co-move in the mutual distance dendrogam, which are hard to explain. Finally, although MX is close to BZ, BZ co-moves with HK in the euclidian distance dendrogram.

We examined the annual reports of the BIS, particularly, the foreign exchange market sections through 2001 to 2008[15]. As put forward in both theoretical and empirical studies of exchange rates, it is asserted in the annual report of the BIS that “exchange rate movements are notoriously difficult to

[14] http://www.moneyweek.com/investments/the-carry-trade-a-tsunami-in-the-making.aspx. http://www.contrarianprofits.com/articles/why-the-yen-and-swiss-franc-are-great-safe-haven-plays-now/5873.

[15] The annual reports of the BIS for the years 2009, 2010 and 2011 do not contain assessments of foreign exchange markets and the determinants behind exchange rate movements as in the previous years.

explain. In particular, it is difficult to find explanations that could be valid for all currency pairs simultaneously" (BIS, 2001: 85).

Movements of the main currencies seemed to be driven by:

- prospective growth differentials, and portfolio and foreign direct investment flows (BIS, 2001: 81);
- the prospects for relative economic performance in the main economic areas, monetary policy decisions and interest rate differentials (BIS, 2002: 79);
- interest rate differentials (BIS, 2003: 80);
- the external imbalance of the United States, interest rate differentials and exchange rate policies in Asia (BIS, 2004: 85);
- the markets' focus on the external imbalance of the United States and the role of the dollar in international portfolios, domestic growth prospects and interest rate differentials and intervention practices in emerging market countries, particularly in Asia (BIS 2005: 82);
- domestic growth prospects and interest rate differentials, the widening external imbalance of the United States and exchange rate policies and intervention practices in emerging market countries (BIS, 2006: 84);
- the macroeconomic outlook, exchange rate policies and associated intervention (particularly in emerging market countries in Asia) and global external imbalances (BIS, 2007: 83);
- expected growth differentials (BIS, 2008: 75).

In accordance with our results, annual reports of the BIS confirm that CA, AL and NZ behave similarly. For example, it was observed that these dollar bloc countries depreciated throughout 2000 (BIS, 2001). Although the driving force behind these currencies, namely, commodity prices rose, this did not support these currencies in 2000. Between early 2000 and late 2001, the traditional positive correlation between AL, CA and NZ dollars and commodity prices did not hold. In 2000, these currencies "had weakened to historical (or close to historical) lows even as commodity prices had risen substantially" (BIS 2002: 87). These currencies depreciated in 2004 as "US monetary policy markedly reduced the attractiveness of carry trades" (BIS 2004: 88), whereas in 2005 depreciation of CA against the US dollar, broke the pattern of broad synchronicity with AL and NZ observed in the past as the latter two appreciated against the US dollar. However, except for 2005, these currencies displayed highly similar patterns between 2001 and 2008. Several Asian currencies, such as TA, KO, TH and TA are mentioned together in the BIS reports and again this supports our finding that they exhibit similar patterns. In 2003, carry trade strategies became attractive given the low interest rate environments in the economies of the United States, European Union, Japan and Switzerland (BIS 2003: 88). This observation is in line with our result that the JP and SZ fit in the same group. Interestingly, BZ and SF are mentioned together in the BIS reports (BZ and SF are considered as emerging markets). Although these currencies are in different groups in our analysis, these two groups are very close to each other. In 2003, BZ and MX exhibited similar dynamics, both experiencing significant declines. Although the movements of NO, SD and DN are also taken into consideration in the BIS reports, the link between those currencies are not as clear as CA, AL and NZ. As mentioned above, these countries formed the Scandinavian Monetary Union in history.

After comparing the LCS results with those obtained by the commonly used measures and confirming them with the BIS annual reports, it can be stated that LCS performs better than the other measures. Below, these results are linked with the well-known exchange rate classifications in the

literature and the IMF's classification. Table 1.2 presents the exchange rate regimes of the countries in our sample in three different studies; Bubula-Otker-Robe (BOR), Ilzetzki-Reinhart-Rogoff (IRAR) and Levy-Yeyati-Sturzenegger (LYS) for the year 2000 and the IMF's 2003 *de facto* classification.

Table 1.2 Exchange rate regimes of the countries in the sample

Currencies	BOR-2000	IRAR*-2000	LYS**-2000	IMF***-2003
EU	-	-	-	-
BZ	Independently floating	Managed floating	Fix	Independently floating
MX	Independently floating	Managed floating	Float	Independently floating
SF	Independently floating	Freely floating	Float	Independently floating
MA	Conventional fixed peg to single currency	Pre announced peg or currency board arrangement	Fix	Other conventional fixed peg arrangements
IN	Tightly managed floating	De facto crawling peg	Interm	Managed floating with no pre-announced path for the exchange rate
AL	Independently floating	Freely floating	Float	Independently floating
NZ	Independently floating	Managed floating	Fix	Independently floating
CA	Independently floating	De facto crawling band that is narrower than or equal to +/-2%	Float	Independently floating
UK	Independently floating	Managed floating	Float	Independently floating
SZ	Independently floating	Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and	Interm	Independently floating
JP	Independently floating	Freely floating	Float	Independently floating
NO	Other managed floating	Managed floating	Fix	Independently floating
DN	Pegged within a horizontal band	De facto peg	Fix	Pegged exchange rates within horizontal bands
SD	Independently floating	Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and	Float	Independently floating
HK	Currency board	Pre announced peg or currency board arrangement	Fix	Currency board arrangements
SI	Tightly managed floating	Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and	Fix	Managed floating with no pre-announced path for the exchange rate
TA	-	-	-	-
KO	Independently floating	Managed floating	Fix	Independently floating
TH	Other managed floating	Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and	Float	Managed floating with no pre-announced path for the exchange rate
VZ	Forward-looking crawling band	Pre announced crawling band that is narrower than or equal to +/-2%	Interm	Other conventional fixed peg arrangements

Note: * These classifications have been obtained from background material for IRAR- Ilzetzki, Reinhart and Rogoff (2008) "Exchange Rate Arrangements Entering the 21st Century: Which Anchor Will Hold?" and can be found in http://personal.lse.ac.uk/ ilzetzki/IRRBack.htm. This study includes updates to the exchange rate regime classifications in RAR. ** The year 2000 has been chosen for BOR, IRAR and LYS since this is the latest year in LYS's database. *** The IMF's exchange rate classification for the years before 2003 could not be reached on the IMF's official webpage. See http://www.imf.org/external/NP/mfd/er/index.aspx.

It can be seen in Table 1.2 that exchange rate regimes may vary in different studies, e.g. Brazil's exchange rate regime is classified as independently floating, managed floating and fix by BOR, IRAR and LYS, respectively for the same year. In addition, although AL, NZ, CA and UK are clustered in the same group with high similarities, whereas BZ and MX form a different cluster in our analysis, all of these currencies have been reported as independently floating by BOR but these currencies' patterns are different. This shows us that there are different explanations behind the

determination, co-movement and interdependencies of these currencies and these are not observed in measures employing standard statistical tools.

1.4 Conclusion

There are various empirical studies on the exchange rate behavior with no common consensus. It is not reasonable to expect that exchange rates would behave independently in this world of increasing globalization, deepening financial integration, and in the light of what we have known for 50 years by the impossible trinity; pegged exchange rate regime, monetary policy sovereignty and free capital flows. If interdependencies exist in currency movements, trajectories of exchange rate data should contain this information. Because of these reasons, exchange rate classifications based on similarities in trajectories would be more efficient since pursuing independent policies is either very difficult or impossible for countries. Analyzing this very difficult phenomenon of co-movements and dependencies of currencies requires more flexible pattern recognition techniques. As discussed in section 1, there have been a few attempts recently. With an application of the pattern recognition technique, LCS, this study demonstrates that exchange rates have some common patterns that can be explained by some non-economic factors such as historical ties and geographical proximity. This study also shows that exchange rate classifications should take the co-movements (common trajectories) of currencies into consideration, and the similarities in the volatility of exchange rates can only be a minor part of the analysis since co-movement contains more information than volatility.

In this study, correlation, brownian distance correlation, euclidian distance, mutual information, KS test, maximal information, and LCS have been used to assess the co-movements of currencies. The findings show that LCS produces better and comprehensible results compared to the other measures. In addition, they make sense when assessed on the basis of the BIS annual reports. According to the LCS results, exchange rate behavior can be explained by historical ties, geographical proximity, political isolation, i.e. Venezuela (VZ). Historical ties seems to be the reason for the similar exchange rate behavior of IN, MA and SF, whereas geographical proximity seems to be the driving force behind the co-movement of HK, SI, TA, KO and TH. For the similar exchange rate dynamics of AL, NZ, CA and the UK, historical ties seem to be the common determining factor. NO, DN and SD were the members of the Scandinavian Monetary Union in history, whereas BZ and MX are both developing countries in Latin America. Other than these, carry trade strategies seem to be the common underlying factor for the co-movement of SZ and JP. Some economic factors such as inflation, commodity prices, interest rate differentials and growth differentials have been mentioned as the driving force behind the exchange rate behavior in the BIS reports, and the relative importance of each economic factor changes from one year to another.

We believe the clusters in this study based on the similarity of trajectories preserve essential information. If there is interdependency between some currencies, trajectory similarity may produce a signal for the monetary authorities to adapt their policy decisions accordingly. The similarities of trajectories are also essential from the viewpoint of the OCA theory. Volatility of the real exchange rates is used as a criterion in the empirical studies of the OCA theory but this measure contains incomplete information since it is an average of all changes in trajectory. Hence, the natural

candidates for adopting a common currency are the currencies that have common patterns. In summary, common patterns of exchange rates are vital and reveal important information for the analyses in the research areas of exchange rate regime choice, monetary policy implementation, and the OCA theory.

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APPENDICES

Appendix A Exchange rates correlation matrix

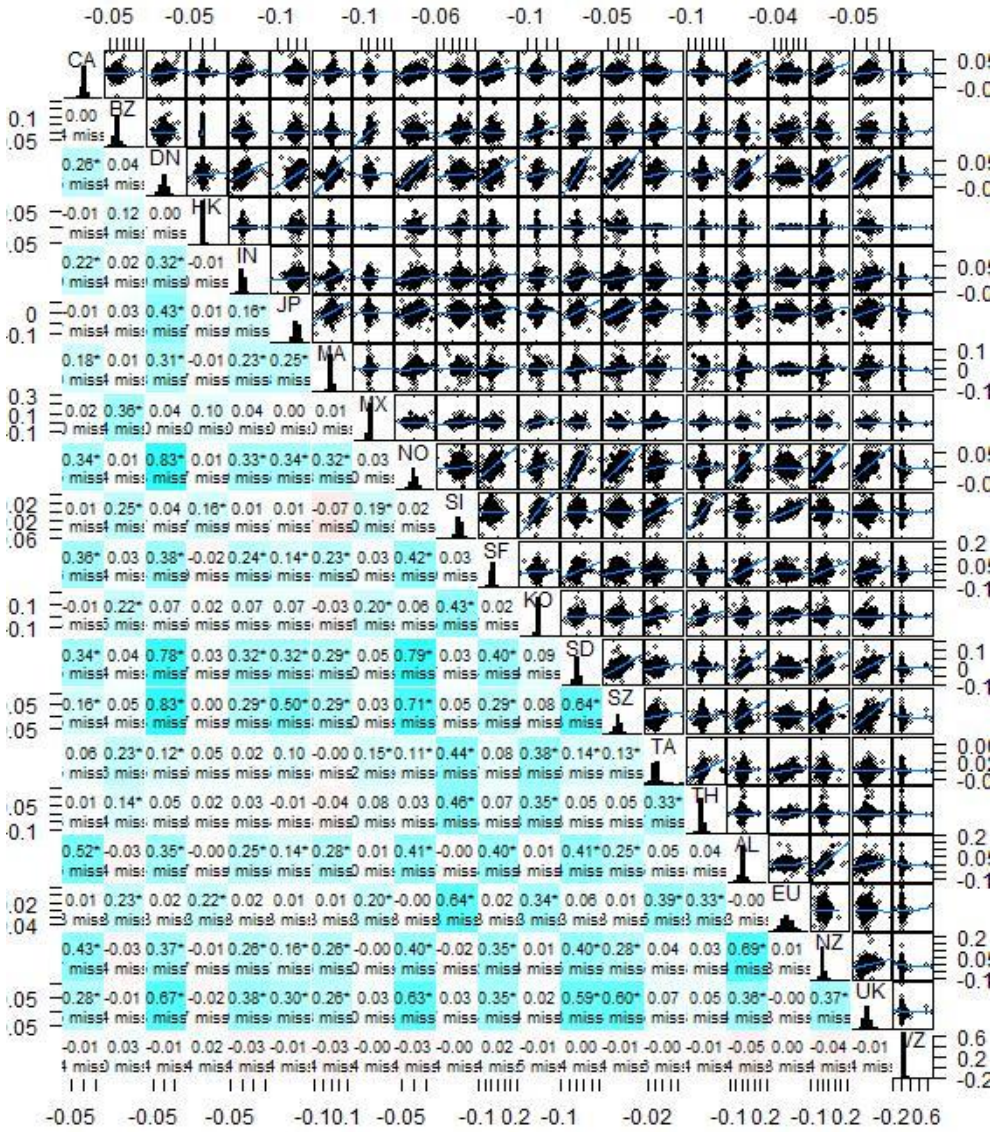


Figure A1 Exchange rates correlation matrix

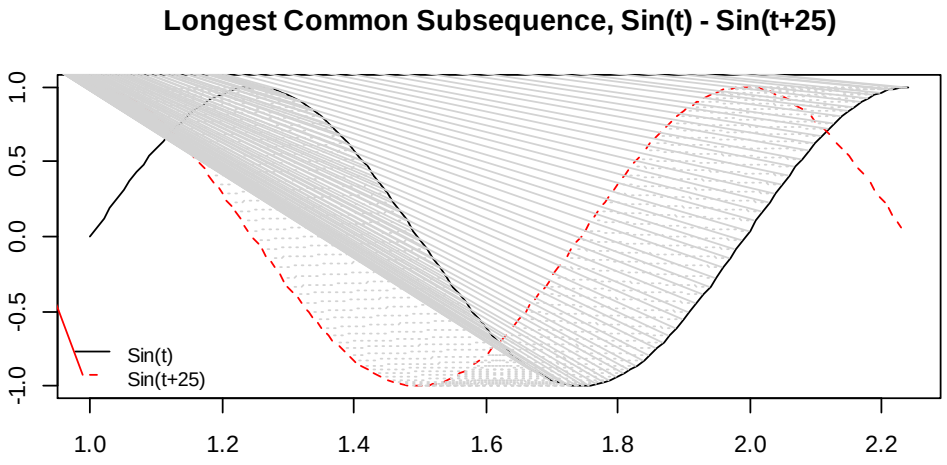
Appendix B LCS distances

Table B1 LCS distances

	CA	BZ	DN	HK	IN	JP	MA	MX	NO	SI	SF	KO	SD	SZ	TA	TH	AL	EU	NZ	UK	VZ
CA	0	0.67	0.30	0.52	0.35	0.31	0.38	0.60	0.30	0.39	0.40	0.48	0.31	0.30	0.46	0.46	0.32	0.69	0.31	0.30	0.86
BZ		0	0.66	0.62	0.65	0.66	0.68	0.39	0.67	0.59	0.62	0.53	0.65	0.67	0.55	0.53	0.62	0.43	0.64	0.65	0.68
DN			0	0.52	0.36	0.30	0.38	0.60	0.24	0.40	0.41	0.49	0.26	0.26	0.46	0.46	0.32	0.67	0.31	0.28	0.85
HK				0	0.48	0.52	0.48	0.55	0.52	0.41	0.57	0.47	0.53	0.52	0.44	0.44	0.54	0.62	0.53	0.52	0.70
IN					0	0.37	0.41	0.59	0.36	0.40	0.43	0.47	0.36	0.37	0.45	0.46	0.38	0.68	0.36	0.36	0.81
JP						0	0.38	0.60	0.29	0.40	0.42	0.49	0.30	0.29	0.47	0.46	0.33	0.69	0.31	0.29	0.84
MA							0	0.61	0.38	0.44	0.46	0.52	0.38	0.38	0.49	0.50	0.40	0.69	0.38	0.38	0.69
MX								0	0.60	0.51	0.62	0.52	0.59	0.60	0.47	0.52	0.60	0.42	0.60	0.60	0.72
NO									0	0.40	0.41	0.48	0.26	0.28	0.46	0.46	0.32	0.69	0.31	0.28	0.85
SI										0	0.48	0.39	0.41	0.40	0.36	0.35	0.42	0.60	0.42	0.41	0.83
SF											0	0.48	0.40	0.43	0.50	0.43	0.37	0.71	0.39	0.40	0.73
KO												0	0.46	0.50	0.39	0.37	0.46	0.63	0.46	0.47	0.77
SD													0	0.30	0.46	0.45	0.31	0.69	0.30	0.29	0.83
SZ														0	0.47	0.47	0.33	0.69	0.33	0.30	0.86
TA															0	0.38	0.47	0.58	0.47	0.45	0.79
TH																0	0.42	0.62	0.44	0.45	0.78
AL																	0	0.69	0.29	0.31	0.83
EU																		0	0.69	0.69	0.77
NZ																			0	0.30	0.82
UK																				0	0.84
VZ																					0

Note: When the LCS distance value is low, the degree of co-movement is high.

Appendix C LCS matching example



Type :Difference, Eps :0.01, Lag :25, Lead :0, Similarity :0.806

Figure C1 LCS matching

Note: In this example, LCS is used to measure the similarity between pure sine and lagged sine functions. Matched points by LCS are connected with dashed lines.

Appendix D Weekly exchange rates cluster dendrograms for other measures

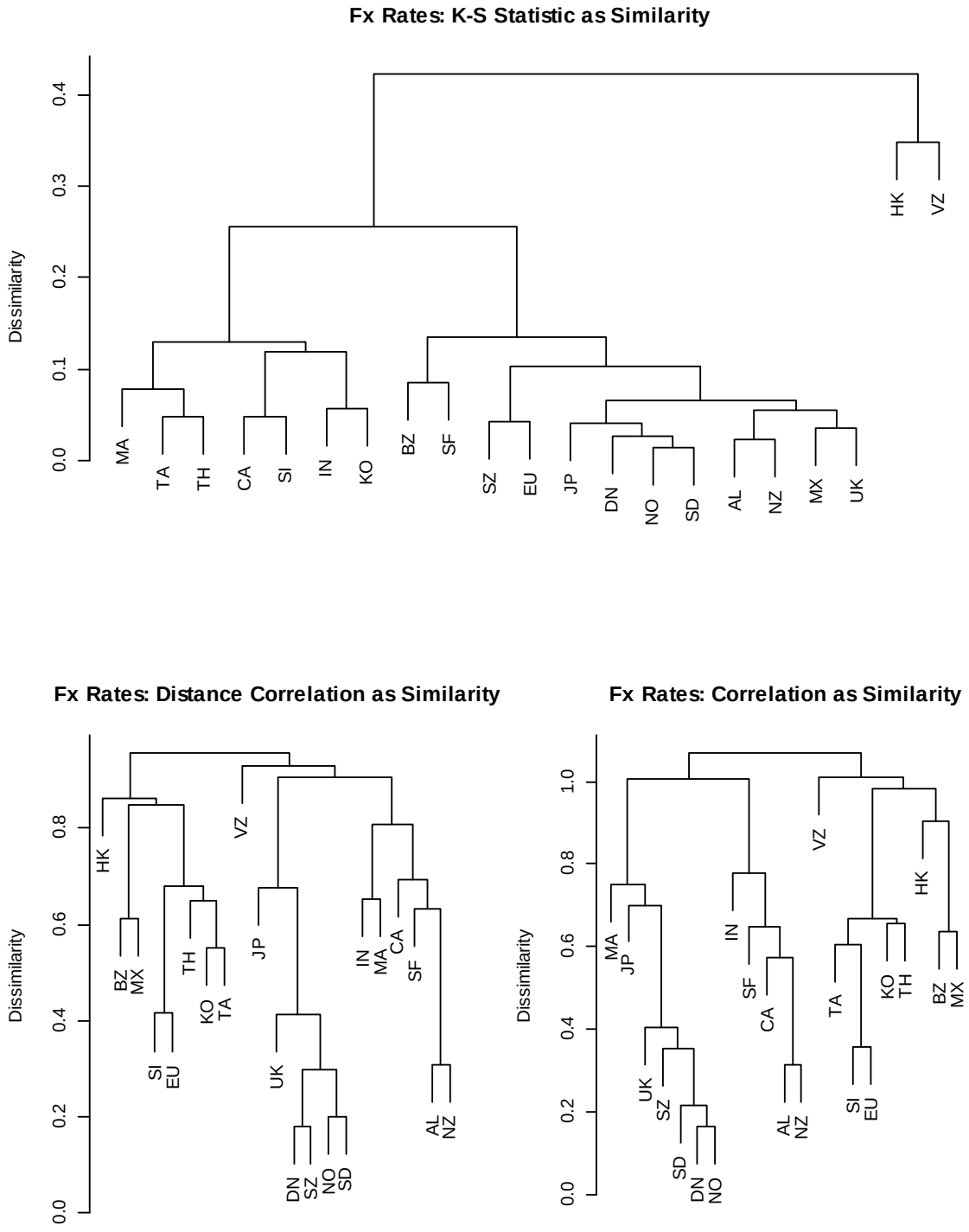


Figure D1 Weekly exchange rates cluster dendrograms for K-S statistic, distance correlation and correlation measures

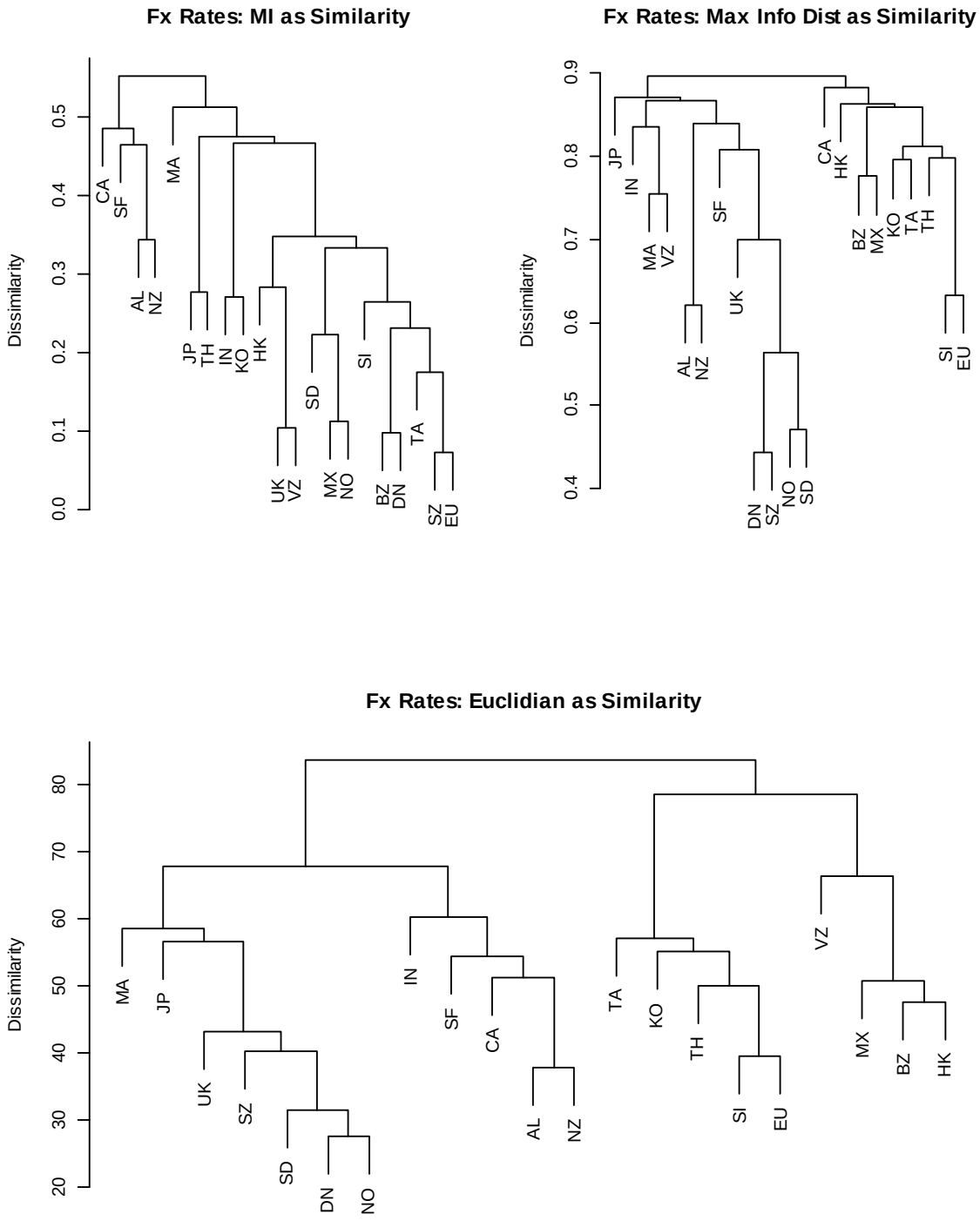


Figure D2 Weekly exchange rates cluster dendrograms for mutual information, maximal information and euclidian measures

Appendix E Simulation

Figure E1 shows the histogram and associated density estimations of simulations results for sequence lengths of 500, 1000 and 2000.

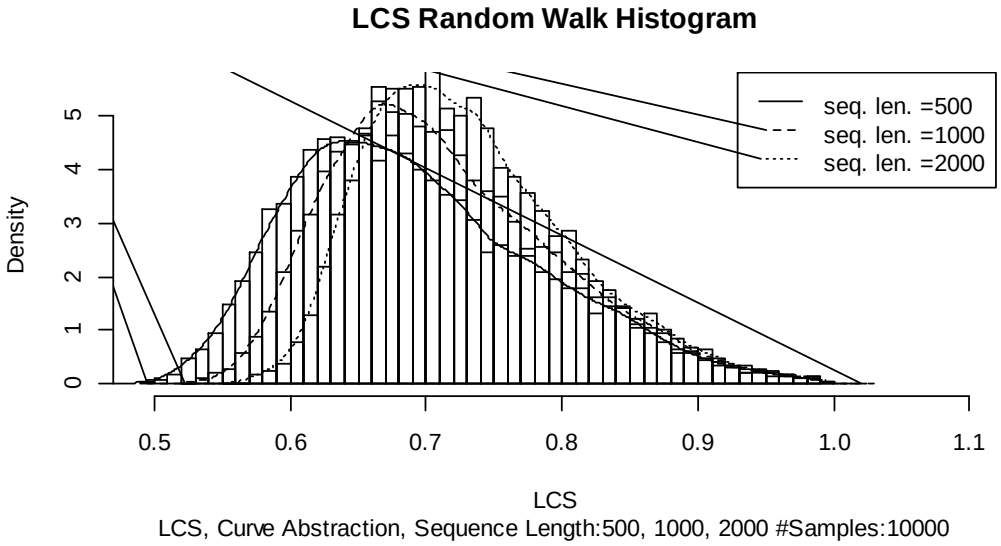


Figure E1 LCS Random walk histogram

In order to check if independent random walks may generate similar LCS measures, we performed a simulation and obtained histograms as well as quantiles for the probabilities of 0.001, 0.005, 0.01, 0.02, 0.05, 0.1, 0.5, 0.9, 0.95, 0.98, 0.99 and 0.999. For each sequence length of 500, 1000 and 2000, 10000 independent random walk pairs are obtained and LCS is calculated.

Table E1 Quantiles of LCS simulations using independent random walks

Quantiles	0.10%	0.50%	1%	2%	5%	10%	50%	90%	95%	98%	99%	99.9%
Seq. Len.=500	0.508	0.528	0.536	0.548	0.566	0.588	0.682	0.824	0.862	0.908	0.936	0.982
Seq. Len.=1000	0.545	0.563	0.571	0.583	0.600	0.618	0.701	0.831	0.869	0.911	0.937	0.984
Seq. Len.=2000	0.577	0.595	0.602	0.612	0.629	0.645	0.721	0.832	0.866	0.905	0.931	0.980

Table E1 shows the quantile values for this simulation. As it can be seen from Table E1 and Figure E1, values less than approximately 0.5 is almost impossible for random walks. Almost all of the LCS calculations for currency pairs are less than 0.5, and hence, we conclude that currency series are not independent random walks.

Appendix F R-scripts

```
# First Step: Install Packages
install.packages(c("zoo", "qualV", "timeSeries", "energy",
"PerformanceAnalytics", "rJava", "gpairs"))
# For biodist
source("http://www.bioconductor.org/biocLite.R")
biocLite("bioDist")

# Second Step: Load Packages
require(timeSeries)
require(zoo)
require(qualV)
require(energy)
require(PerformanceAnalytics)
require(rJava)
require(bioDist)
require(gpairs)
# End installing and Loading Packages

# Third Step: Load Exch Comov Book Chapter Objects. Working directory
# should be set to the directory where FxComov.RData file is located.
# Set Working Directory
setwd("E:\\....\\")
# Load WorkSpace
load("E:\\...\\FxComov.RData")

############    CREATING FIGURES    ############

### Fig 1 - Dendrogram with LCS similarity
win.graph(6.5, 5.3, pointsize=10)
plot(hcLCS,main="Fx Rates: LCS as Similarity", sub="",
    xlab="",ylab="Dissimilarity")
### Fig 1 - Dendrogram with LCS similarity

### Appendix A: Exch Rates Return Correlation
# Pairs Plot with Correlation  Beware: Figure has big size, try save as png
# Pairs with return series.. Upper triangle is scatter, lower is cor stat
x11()   # Open a new window..
gpairs(Return.calculate(exchRatesW, method="compound"),lower.pars = list(scatter = 'stats'),
upper.pars = list(conditional = 'boxplot', scatter = 'loess'))
### Appendix A: Exch Rates Return Correlation

### Appendix D: Fig D1
win.graph(6.5, 8.7, pointsize=10)
layout(matrix(c(1, 1, 2, 3), nrow=2, byrow=T))

par(mar=c(5.1,4.1,4.1,2.1))
plot(hcKSres,main="Fx Rates: K-S Statistic as Similarity", sub="",
    xlab="",ylab="Dissimilarity")

par(mar=c(5.1,4.1,4.1,2.1))
plot(hcDCRret,main="Fx Rates: Distance Correlation as Similarity", sub="",
    xlab="",ylab="Dissimilarity")
```

```
par(mar=c(5.1,4.1,4.1,2.1))
plot(hcCRret,main="Fx Rates: Correlation as Similarity", sub="",
    xlab="",ylab="Dissimilarity")
### Appendix D: Fig D1

### Appendix D: Fig D2
win.graph(6.5, 8.7, pointsize=10)
layout(matrix(c(1, 2, 3, 3), nrow=2, byrow=T))

par(mar=c(5.1,4.1,4.1,2.1))
plot(hcMIret,main="Fx Rates: MI as Similarity", sub="",
    xlab="",ylab="Dissimilarity")

par(mar=c(5.1,4.1,4.1,2.1))
plot(hcMNret,main="Fx Rates: Max Info Dist as Similarity", sub="",
    xlab="",ylab="Dissimilarity")

par(mar=c(5.1,4.1,4.1,2.1))
plot(hcECret,main="Fx Rates: Euclidian as Similarity", sub="",
    xlab="",ylab="Dissimilarity")
### Appendix D: Fig D2

### Appendix E: Fig E1
win.graph(6.15, 3.4, pointsize = 10)
xb=c(min(c(1-s500/500,1-s1000/1000, 1-s2000/2000)), max(c(1-s500/500,1-s1000/1000,1-s2000/2000))+0.1)
yb=range(c(density(1-s500/500)$y,density(1-s1000/1000)$y, density(1-s2000/2000)$y))
subtxt = "LCS, Curve Abstraction, Sequence Length:500 & 1000, #Samples:10000"
hist(1-s500/500, breaks="FD", xlim=xb, prob=T, ylim=yb,
main="LCS Random Walk Histogram",
xlab="LCS", sub=subtxt)
lines(density(1-s500/500), lty=1)
hist(1-s1000/1000, breaks="FD", add=TRUE, prob=T)
lines(density(1-s1000/1000), lty=2)
hist(1-s2000/2000, breaks="FD", add=TRUE, prob=T)
lines(density(1-s2000/2000), lty=3)
legend("topright", legend = c("seq. len. =500","seq. len. =1000", "seq. len. =2000"),
lty=c(1,2,3), col=c("black","black"))
### Appendix E: Fig E1

### Appendix E: Table E1
ql2=c()
prbs<-c(0.1, 0.5, 1, 2, 5, 10, 50, 90, 95, 98, 99, 99.9)/100
ql2=rbind(ql2,quantile(1-s500/500,  probs = prbs))
ql2=rbind(ql2,quantile(1-s1000/1000,  probs = prbs))
ql2=rbind(ql2,quantile(1-s2000/2000,  probs = prbs))
rownames(ql2)=c("Seq. Len.=500","Seq. Len.=1000","Seq. Len.=2000")
ql2
### Appendix E: Table E1

###                Creating Dendrogram Objects
### Following Scripts should be run to obtain the dendrogram objects
### Workspace already includes these objects. Run them if needed.

###   LCS Distance and Dendrogram   ###
```

```
LCSDistM = function(dat) {
  require(qualV)
  nc=dim(dat)[2]
  ld2=matrix(rep(0,nc*nc),nrow=nc)
  nms=colnames(dat)
  colnames(ld2)=nms
  rownames(ld2)=nms

  for (i in 1:nc) {
    for (j in i:nc) {
      lcs <- LCS(f.curve((1:length(na.omit(dat[,i]))),na.omit(dat[,i])),
      f.curve((1:length(na.omit(dat[,j]))),na.omit(dat[,j])))  # too much noise
      ld2[i,j]=lcs$QSI
    }
  }
  ld2=1-ld2
  hc.reslc=hclust(as.dist(t(ld2)))
  X11()
  plot(hc.reslc)
  return(ld2)
}
exchw=LCSDistM(exchRatesWDat,iss="exchw")
hcLCS=hclust(as.dist(t(exchw)))
###   LCS Distance and Dendrogram   ###

### Kolmogorov-Smirnov Distance and Dendrogram -(For Return Series)  ###
### Kolmogorov-Smirnov p-Value as Similarity
exchw.r=Return.calculate(exchRatesW, method="compound")
nc=dim(exchw.r)[2]
dks=matrix(rep(0,nc*nc),nrow=nc)
colnames(dks)=colnames(exchw.r)
rownames(dks)=colnames(exchw.r)
for (i in 1:dim(exchw.r)[2]) {
    for (j in i:dim(exchw.r)[2]) {
      dks[i,j]=ks.test(as.vector(exchw.r[,i]),as.vector(exchw.r[,j]))$statistic
  }
}
hcKSres=hclust(as.dist(t(dks)))
### Kolmogorov-Smirnov p-Value as Similarity and Dendrogram

### Distance Correlation as Similarity and Dendrogram -(For Return Series)  ###
Getdcor = function (zz){
  require(energy)
  nv=dim(zz)[2]
  ldcor=matrix(rep(0,nv*nv), ncol=nv)
  for (i in 1:nv){
    for (j in i:nv){
      ldcor[i,j]=dcor(na.omit(zz[,c(i,j)])[,1],na.omit(zz[,c(i,j)])[,2])
      cat(colnames(zz)[i], "-", colnames(zz)[j],ldcor[i,j],"\n")
    }
  }
  colnames(ldcor)=colnames(zz)
  rownames(ldcor)=colnames(zz)
  return(ldcor)
```

```
}
lddwret=Getdcor(returns(exchRatesW))
hcDCRret=hclust(as.dist(1-t(lddwret)))
### Distance Correlation and Dendrogram -(For Return Series)  ###

### Correlation as Similarity and Dendrogram -(For Return Series)  ###
hcCRret=hclust(as.dist(1-cor(returns(exchRatesW), use="pairwise.complete.obs")))
### Correlation as Similarity and Dendrogram -(For Return Series)  ###

### Mutual Information as Similarity and Dendrogram -(For Return Series)  ###
hcMIret=hclust(MIdist(t(returns(exchRatesW)), nbin=12))
### Mutual Information as Similarity and Dendrogram -(For Return Series)  ###

### Maximal Information as Similarity and Dendrogram -(For Return Series)  ###
### MINE.r file must be saved in the same direct.                    ###
### JAVA MUST BE INSTALLED BEFORE RUNNING THIS SCRIPT                ###
source("MINE.R")
mymine=function(x,y){
  xx=cbind(x,y)
  write("x,y",file="test.csv")
  write(t(xx),sep=",",file="test.csv",ncol=2,append=T)
  command <- 'java -jar MINE.jar "test.csv" -allPairs'
  system(command)
  res=scan("test.csv,allpairs,cv=0.0,B=n^0.6,Results.csv",what="",sep=",")
  val=as.numeric(res[11])
  return(val)
}

GetMINE = function (zz){
  nv=dim(zz)[2]
  ldcor=matrix(rep(0,nv*nv), ncol=nv)
  for (i in 1:nv){
    for (j in i:nv){
      ldcor[i,j]=mymine(na.omit(zz[,c(i,j)])[,1],na.omit(zz[,c(i,j)])[,2])
      cat(colnames(zz)[i], "-", colnames(zz)[j],ldcor[i,j],"\n")
    }
  }
  colnames(ldcor)=colnames(zz)
  rownames(ldcor)=colnames(zz)
  return(ldcor)
}
lddmret=GetMINE(returns(exchRatesW))
hcMNret=hclust(as.dist(1-t(lddmret)))
### Maximal Information as Similarity and Dendrogram -(For Return Series)  ###

### Euclidian Distance as Similarity and Dendrogram -(For Return Series)  ###
hcECret=hclust(dist(t(scale(returns(exchRatesW)))))
### Euclidian Distance as Similarity and Dendrogram -(For Return Series)  ###

R session information is as follows:
> sessionInfo()
R version 2.15.2 (2012-10-26)
Platform: i386-w64-mingw32/i386 (32-bit)
```

```
locale:
[1] LC_COLLATE=Turkish_Turkey.1254  LC_CTYPE=Turkish_Turkey.1254    LC_MONETARY=Turkish_Turkey.1254
LC_NUMERIC=C                        LC_TIME=Turkish_Turkey.1254

attached base packages:
[1] grid      stats     graphics  grDevices utils     datasets  methods   base

other attached packages:
 [1] gpairs_1.1                vcd_1.2-13                colorspace_1.2-0          barcode_1.1               lattice_0.20-10
 [6] bioDist_1.30.0            Biobase_2.18.0            BiocGenerics_0.4.0        rJava_0.9-
3                 PerformanceAnalytics_1.0.4.4
[11] xts_0.9-1                 energy_1.4-0              MASS_7.3-22               boot_1.3-7                qualV_0.3
[16] KernSmooth_2.23-8         zoo_1.7-9                 timeSeries_2160.95        timeDate_2160.97          BiocInstaller_1.8.3

loaded via a namespace (and not attached):
[1] tools_2.15.2
>
```

Chapter 2

COLLATERAL COMPOSITION, DIVERSIFICATION RISK, AND SYSTEMICALLY IMPORTANT MERCHANT BANKS

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COLLATERAL COMPOSITION, DIVERSIFICATION RISK, AND SYSTEMICALLY IMPORTANT MERCHANT BANKS

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Abstract

We study the impact of collateral diversification by non-financial firms on systemic risk in a general equilibrium model with standard production functions and mixed debt-equity financing. Systemic risk comes about as soon as firms diversify their collateral by holding claims on a big wholesale (merchant) bank whose asset side includes claims on the same producer set. The merchant bank sector proves to be fragile (has a short distance to default) regardless of competition. In this setting, the policy response consisting in official guarantees for the merchant bank liabilities entails considerable government loss risk. An alternative without the need of public sector involvement is to encourage systemically important merchant banks to introduce a simple bail-in mechanism by restricting their liabilities to contingent convertible bonds. This direction of regulatory policies can be particularly relevant for containment of systemic events in globally leveraged economies serviced by big international banks outside the host country regulatory control.

Keywords: collateral, diversification, default systemic risk, merchant bank, CoCos.

2.1 Introduction

Financial instability and crises are inseparably tied to the phenomenon of default. A crisis can start with mass defaults on micro level, as in the US subprime mortgage market breakdown case of 2007. It often results in default, including one of financial intermediaries, as in most manifestations of the latest financial crisis in the US and Europe following summer months of 2008. At its worse, there is a vicious circle of defaults involving banks, non-banking private sector and the government, so that funds borrowed to prevent insolvency in one sector push towards insolvency the one who went to rescue, as in the current EU periphery sovereign debt impasse. This makes default a natural candidate for the role of absolute economic evil and the main adversary of prudential policy.

However, as if totally unaware of this dismal record, the available economic theories of default offer a much less dramatic picture. Agents enter into debt contracts conscious of the possibility that the payment obligation will not be honored, and there is a whole spectrum of methods, from elementary to highly sophisticated, describing how the non-payment contingency can be reflected in the price of a debt claim. In popular terms, forewarned should be forearmed, so, where are the arms of rational creditors? If default is so universally bad, why are there perfectly sensible theories telling us how the debtor chooses to default optimally, or how the creditor optimally calls an insolvency procedure in advance of a credit event? Unfortunately, economics has not yet developed a

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comprehensive picture of default costs, their genesis, structure or ways of containment. These matters are mainly explored by practitioners. From the point of view of the latter, including policymakers, the disastrous effect of default on economic activity and welfare comes from two sources: legal complexity of debt workout procedures and destruction of value, such as human capital and other assets, as a result of forced changes of ownership and control. Neither of the named areas is sufficiently investigated by mainstream financial economics whose language is usually employed to formulate policy. Therefore, there is not much more than a general understanding that both private and social default costs are significant enough to be acted against. This understanding has a very long tradition and may have been the principal force behind the custom, existing since ancient times, of equipping loan agreements that showed a material default probability, with the provision of recourse to collateral. Accordingly, without dwelling excessively on the question why, economics of debt and investment includes collateral as a standard element of its models. As an unintended consequence, since financial crises same as their spillovers to the real economy are crises of risky debt and the latter has collateral attached to it (with the objective to reduce risk), what we face are, essentially, crises of collateral markets. This observation has been gradually finding its way into formal theory in works of Morris and Shin (2004), Brunnermeier and Pedersen (2009) and Geanakoplos (2010), among others.

No matter how much an in-depth theory of default involving collateral processing would be welcome, our objective here is more modest and goes in a somewhat different direction. Taking as given the lesson that factors relevant for collateral price movements matter substantially for the economy as whole, we would like to examine in what ways the heterogeneous collateral and the origin of its different subspecies, can generate sources of systemic risk. This is a question earlier models did not cover sufficiently. For an answer, we will employ a formal approach much more explicit than the extant macroeconomic models (mainly DSGE) have been used to.

The rest of the chapter is organized as follows. In Section 2.2, we give a formal outline of the problem, our solution approach and put both in the context of existing literature. Section 2.3 describes the model. Section 4 reports results of numerical experiments of different merchant bank liability regimes. Section 5 discusses implications of these simulation results in more detail and concludes.

2.2. Methodological background

What we work with is, essentially, a model of production financing in which the Modigliani-Miller law does not hold for capital scarcity reasons. Those who have the knowledge and authority to invest (firm shareholders) do not have own funds whereas those who can bring investors and production opportunities together (merchant banks) first need to convince at least some of the potential investors to become depositors as well, since there is no one else to turn to. However, no one can deposit enough without borrowing from some other party (commercial banks) first, and such loans are risky. This economy can only operate with leverage, and with leverage comes a systemic risk threat.

It turns out that, in a fairly standard model of debt-financed producer choices under uncertainty, the threat of a systemic collateralization breakdown is not just conceptually, but also

quantitatively, significant. To see this, one only needs to recognize and implement in the model a few notoriously salient stylized facts.

First, firms and their managers do not normally engage in outside equity investment of their own. Particularly, when they decide to purchase liquid collateral other than a sight deposit, they have no other choice than to become clients of the investment banking industry. Second, investment banking tends to be oligopolistic with marked economies of scale. This property is usually explained, among other things, by diversification benefits positively related to size, soft "closed club" human expertise of investment monitoring and information processing, or high fixed costs involved, sometimes also by political clout going hand in hand with network externalities. In any case, and despite turbulent structural overhauls they regularly go through, mature financial centers catering to corporate clients are invariably dominated by a few big companies, for which we will employ the term merchant bank[17]. Third, no matter how much the merchant bank would like to fund its liabilities by a well-diversified asset portfolio, in a globalized (i.e. essentially closed) economy it cannot avoid buying liabilities connected to, ultimately, the same universe of firms whose deposit money it accepts. The chain from some firm's excess cash invested in a merchant bank CD to a private equity fund holding shares of that very firm may have multiple links, but it can be invariably traced down. Accordingly, by aggregating the merchant bank sector into one entity and inspecting that entity's balance sheet, we feel it justifiable to stylize the analysis, initially, to the case of just a few firms (we will have two in the quantitative examples of this chapter) holding claims on one merchant bank who, in its turn, holds a tangible portion of equity of those same firms.

Not surprisingly, in such an environment, the aggregate productivity threshold below which there comes default of the merchant bank is much higher than the same threshold for an individual producer. The merchant bank has to pay sufficiently high deposit rates to its investors to be attractive as a collateral provider. Therefore, there is a clear bound to the merchant bank profit regardless of competition in the industry. The situation of a commercial bank lending to the same producers is qualitatively different, as its market power depends mainly on informational exclusivity in relation to the client and is only limited by the productivity characteristics of the latter.

The merchant bank can offer claims on itself as diversified collateral to the firms only as long as it is solvent, but the solvency buffer size, i.e. the merchant bank profit, is limited by the need to make collateral worthy. Consequently, diversified collateral in the form of deposits (or bonds) is much more susceptible to systemic impairment than liabilities of standalone producers. Under this structure of financial services, the more one tries to diversify the more fragile leverage one creates, and the harsher are the aggregate consequences.

Can there be a remedy, particularly assisted by an appropriate policy? The most immediate one (also tried many times) would be an official guarantee of the merchant bank liabilities. However, the fiscal costs may be untenable, as the Irish and Spanish examples of these days make clear. Naturally, going back to default treatment in the earlier mainstream microeconomics, a merchant bank default would be no problem at all if its pecuniary implications were transferred one-to-one to the ultimate creditors and did not receive an institutional spin in the form of value-destroying bankruptcy

[17] Our use of the term is motivated by its inclusiveness in the sense that features like catering to the corporate sector instead of retail clients, cross-border operations, involvement in private equity investment and substantial market power are, or were in the past, all typical for this financial institution variety. A historical overview of the subject can be found in, e.g. Craig (2002).

procedure. In a frictionless world, this could be achieved if the merchant bank were mandated to issue only equity as liabilities. Still, merchant bank equity may be unsellable to firms for reasons already explained in Townsend's (1979) costly state verification (CSV) model: impossibility for a small shareholder to establish the appropriate value of the dividend that a big and complex merchant bank owes him. Therefore, we suggest an alternative, equally inspired by Townsend (1979) as well as the Black-Scholes (1973) and Merton (1974) treatment of risky company debt. Recall that under the Black-Scholes-Merton approach the company assets in default are transferred one to one to the creditor. The same thing happens under the debt contract considered in Townsend (1979). This is tantamount to the creditor becoming a shareholder. The resulting liability is a fixed-income debt instrument in good times and equity in bad times, i.e., essentially, a convertible bond. An important formal difference with the classical understanding of the latter is that its covenant makes conversion the decision of the holder. In our setting, the conversion trigger is exogenously tied to the merchant bank solvency (the current model is sufficiently simple in this respect, so that one can assume automatic conversion whenever the bank is unable to pay the original deposit rate, without further procedural details). This means that our construction is, essentially, a variety of the so-called contingent convertible (CoCo) bond. In our view, the most important advantage of this bond covenant is that a shareholder of a living company has a much stronger legal standing in what concerns state verification than a creditor of a defaulting company. So, the key statement we want to exemplify with our formal exercise is that an insolvent merchant bank should not be sent into bankruptcy but rather, exchange its fixed income liabilities for shares and then distribute whatever (little) it actually earned among the old and new shareholders. In this way, consequences of an adverse aggregate productivity shock will not be avoided. They will still be borne. However, in our model of merchant bank bond conversion they only have a one-to-one impact on firm owners whereas in a pure deposit-taking merchant bank facing insolvency they are expanded. Additional losses emerge either because of a system-wide shock due to debt workout delays and destruction of value (if the merchant bank is allowed to fail) or in view of a heavy fiscal burden (if official deposit guarantees are given). Accordingly, risks will be diversified as long as they are really diversifiable and not just be different labels of an aggregate risk common to everybody (as in a systemic shock case), whereas the costs of the latter will be distributed predictably among firm owners without a legal breakdown.

Firms that hold liquid assets in parallel with using bank loans are a well known phenomenon. It was studied theoretically in the context of credit constrained neoclassical economy by Woodford (1990), and there has been substantial theoretical and empirical literature in the same vein since then (see, e.g., Bacchetta and Benhima, 2010, for further references). Diversification leading to the opposite of its initial goal, i.e. risk concentration, has been quantitatively examined by, e.g., Ibragimov *et al.* (2011) and a host of earlier papers cited therein. However, these models are almost purely probabilistic and have but a rudimentary economic structure (i.e. no distinction between agent roles or between equity and debt, etc.). In our approach, diversification curse is accommodated in a standard choice-theoretic environment of a production economy.

2.3. Model

2.3.1 The economy

Agents of this economy include firm shareholders, firm managers, workers, commercial banks and merchant banks. In the baseline setup, there will be two firms with one shareholder, one manager and one worker in each, two commercial banks and one merchant bank. Investment opportunities include firm stock (available to the merchant bank), bank loans (available to the commercial banks) and claims on the merchant bank in deposit form (available to the two firms' shareholders).

A household sells one unit of labor to his firm. A shareholder owns an exogenous endowment of stock in his firm, measured in the same units as physical capital and transferrable between the latter and deposits in the merchant bank, at no cost. Firm managers hire labor, borrow from commercial banks and split the loan proceeds between wage expenditure and purchase of physical capital in access of the quantity provided by the shareholder. The merchant bank purchases private equity partnerships in both firms with funds raised as deposits; it can also invest in the world market (outside the examined economy) at a fixed positive rate.

There are two periods. In the first, labor hiring and pre-paying, borrowing and investment decisions are made, in the second, the production output is sold and the revenue distributed between the borrowers and the lenders, and other investment returns paid out.

The producer has a Cobb-Douglas production function

$$Af(k,m) = ALk^{\alpha}m^{1-\alpha}, \tag{2.1}$$

in which k is physical capital, m is labor, L is a private total factor productivity (TFP) component, and A is an aggregate TFP component. We think of the situations in which A is a random variable with known distribution, whereas L is either a simple scaling constant (benchmark case) or a firm-specific parameter with each of a large set of small firms identified by their individual L-values.

Capital is released after the end of the production cycle, but its transformation from producer-specific to generally usable state is costly. For each quantity k leaving the production facility one gets $(1-t(k))k$ marketable units for further use. The structure of capital transformation function t is as follows:

$$t(k) = \delta + \tau(k), \tag{2.2}$$

where positive constant δ is the conventional depreciation rate and a strictly increasing function τ ($\tau(0)=0$, $\tau(k)>0$ for all $k>0$) stands for increasing "capital dismantling" costs. That is, τ can be considered a reverse of the traditional capital installation cost function. If the firm defaults (see later), $(1-t(k))k$ is added to the collateral seized by the lender, if it survives, this term is a part of the shareholder revenue ("EBIT"). Thus, EBIT comprises

$$Af(k,m) + \big(1-t(k)\big)k,$$

and one other term to be described below.

We assume a competitive labor market with labor force supply normalized to unity for each firm (if there are many firms, one has to assume some form of firm-specific skills; in that case, m becomes more a variety of human capital than classic unskilled labor). Labor market competitiveness means that workers are paid the marginal product of labor as wage, and the wage expenditure is subtracted from the firm revenue. To avoid dealing with wage settlements in a defaulting firm, we assume that the whole wage bill is paid in advance in period 1, for which purpose the firm borrows the whole amount b^m from its "house" bank (working capital loan).

The labor market does not play any significant conceptual role in this model, but it is necessary for calibration purposes. With a single-input production function, one would have obtained unrealistically high marginal products of capital as well as interest rate levels, and also have had difficulties generating reasonable default rates.

Remark The present version is in two periods. In a multi-period variant, interpretation of m as skilled labor (firm-specific human capital) could be used to augment default costs in welfare terms with the corresponding loss of accumulated human capital. This feature might add rationale to policy trying to reduce default frequency.

2.3.2 Borrowing, collateral, and default

Physical capital is financed by both equity and bank debt. If q is the amount available as equity (the equity market shall be defined separately), then

$$k = q - v + b^k \tag{2.3}$$

Here, b^k is the amount borrowed to co-finance physical capital purchase. We have already introduced another component of bank debt, b^m, needed to pay labor force wages. Thus, the total loan size is $b=b^k+b^m$.

The remaining term on the right hand side of (2.3), v, is the amount set aside by the controlling shareholder as a source of additional collateral in excess of $(1-t(k))k$. This quantity (we call it diversified collateral) is invested outside the firm to generate a buffer formally unrelated to the company's own production. (Note that "unrelated to" does not always mean "independent of", since, under systemic events, as we shall see, the dependence comes about.) When $v=0$, the only collateral the firm has comes from its own output and (dismantled) physical capital. When $v>0$, the collateral is augmented by $(1+i^o)v$, where i^o is the rate of return that can be earned on v in financial markets through the merchant bank. In a surviving firm, $(1+i^o)v$ is a part of its revenue. We set the maximal allowed value of v equal to q in order to exclude cases of unlimited leverage out of bank-lent funds. When $v=q$, the firm only finances physical capital out of its bank loan while spending the totality of its equity capital on collateral diversification. Such a behavior, if shared by all producers, generates the maximum admissible degree of leverage in the economy.

The firm pays the shareholders dividends defined as:

$$y(A) = \max\left\{Af(k,m) + \left(1-t(k)\right)k + (1+i^o)v - (1+r)(b^k+b^m), 0\right\}, \tag{2.4}$$

under constraint $b^k=k-q+v$. In a defaulting firm, $Af(k,m)+(1-t(k))k+(1+i^o)v$ is treated as collateral seized by the bank. This definition of collateral is a synthesis of the Classical Black-Scholes-Merton one (Black and Scholes, 1973, Merton, 1974), later taken over by Bernanke, Gertler and Gilchrist (1999) and supported by Townsend's (1979) CSV analysis, and the Kiyotaki-Moore (1997) concept, also widely used in models created by Geanakoplos (cf. Geanakoplos, 2010, and references to his earlier papers therein). The "Merton part" is formed by the output plus released physical capital, $Af(k,m)+k$. We have added the $-kt(k)$ term to account for the difference between firm-specific and general collateral, important both conceptually and quantitatively. The term $(1+i^o)v$ is the "Geanakoplos part", potentially liquid but subject to random swings in value. In a multi-period model, this part would be the source of collateral cycle and, given a systemic event, the debt deflation effect.

The firm either survives or defaults depending on the realized total factor productivity A. Survival is equivalent to the firm's EBIT exceeding its debt service:

$$Af(k,m)+\left(1-t(k)\right)k+(1+i^o)v \geq (1+r)\left(b^k+b^m\right). \tag{2.5}$$

This happens if and only if the realized A exceeds the threshold value:

$$A^d=\frac{(1+r)\left(b^k+b^m\right)-\left(1-t(k)\right)k-(1+i^o)v}{Lk^{\alpha}m^{1-\alpha}}. \tag{2.6}$$

If the realized A is below A^d, the firm defaults and the bank seizes EBIT, whereas the firm shareholders get nothing. There are situations in which A^d is negative (typically, this means very strongly capitalized firms in an environment of low lending rates), in which case survival is a certainty.

2.3.3 Investment and labor hiring decisions

Let us denote the p.d.f. of aggregate TFP factor A by φ and introduce the notation:

$$\Phi^+(A)=\int_A^{+\infty}\varphi(S)dS,\ \Psi^+(A)=\int_A^{+\infty}S\varphi(S)dS, \text{ for } A\geq 0.$$

That is, $\Phi^+(A^d)$ is the survival probability of the firm and $\Psi^+(A^d)$ is the expected TFP of surviving firms. Another piece of notation to be used in the sequel is:

$$\theta(A)=\frac{\Psi^+(A)}{\Phi^+(A)}\ -$$

the average TFP-value of a firm conditioned on it exceeding A.

For future use, we also introduce the notation Φ for the cumulative distribution of A (i.e. $\Phi^+(A)=1-\Phi(A)$) and Ψ^- - for the expected TFP of defaulting firms (i.e. $\Psi^-(A)=\overline{A}-\Psi^+(A)$, $\overline{A}$ being the unconditional mean of A).

We assume a hired manager remunerated in proportion with the firm's dividend (i.e. the manager receives 0 if the firm defaults). This assumption is made to avoid complications with agency

problems between the shareholder and the manager. Also for the sake of simplification, we assume manager risk-neutrality.

The manager takes the level of equity q, the diversified collateral v, the lending rate r and the wage level as given and decides upon labor hiring and investment in physical capital k (which, for him, becomes equivalent to setting the size of the bank loan). Due to risk-neutrality, the chosen k- and m-levels must satisfy the first order conditions:

$$\Psi^{+}\left(A^{d}\right) f_{k}(k,m) = \Phi^{+}\left(A^{d}\right)\left[r + t(k) + kt'(k)\right], \tag{2.7a}$$

$$\Psi^{+}\left(A^{d}\right) f_{m}(k,m) = \Phi^{+}\left(A^{d}\right)(1+r)w, \tag{2.7b}$$

where w is wage, paid, as was agreed, out of the bank loan in advance of production (that is why (2.7b) contains the lending rate factor 1+r). Accordingly, $b^{m}=wm$ and

$$\theta\left(A^{d}\right) f_{m}(k,m)m = (1+r)b^{m}.$$

In the case of Cobb-Douglas production, this fact allows one to eliminate the labor market variables from further calculations completely. Recall that we normalize the labor input to unity, therewith pinning the wage level down.

2.3.4 Bank loans

Jointly, production decisions (2.7) determine the demand $B(r)$ for loans (parameters on which B depends beside r are omitted for simplicity). On the credit supply side, a commercial bank is assumed to enjoy market power over borrower (e.g. due to a borrower hold-up problem of the Diamond-Rajan type, cf. Diamond and Rajan, 2000, as the firm cannot credibly communicate its productivity type to outsiders). The base funding cost for the bank is denoted by i. To endow credit supply side with some realistic elasticity, we assume that there is also a non-linear component of the funding cost, e.g. quadratic of the form

$$\frac{a}{2}\left(\frac{B(r) - v - y_{0}}{q}\right)^{2}, \tag{2.8}$$

which is added to the linear component (1+i)$B(r)$ and puts an additional brake on borrower leverage expansion in excess of some exogenous reference level. Here, we have set the driving variable of this brake as the ratio of the debt in excess of the diversified part of the collateral plus a reference output, y_0, over the equity value. The exogenous parameters appearing in (2.8), namely, y_0 and a positive constant a, originate in macroprudential regulation.

We will denote by hats the variables (such as physical capital and production level) chosen optimally by the borrowing firm. A risk-neutral bank announces r taking into account the loan demand, its funding costs, and the equity value of the loan applicant. Altogether, the bank maximizes the expected profit from the loan given by:

$$\Psi^{-}\left(\hat{A}^{d}\right)\hat{f}+\Phi\left(\hat{A}^{d}\right)\left[\left(1-t\left(\hat{k}\right)\right)\hat{k}+\left(1+i^{o}\right)n\right]+\Phi^{+}\left(\hat{A}^{d}\right)(1+r)B(r)-(1+i)B(r)-\frac{a}{2}\left(\frac{B(r)-n-y_{0}}{q}\right)^{2}$$

2.3.5 Choice of collateral diversification

We assume that the shareholder sets aside the preferred quantity of diversified collateral, *v*, in advance of all other decisions in the first period. Generically, varying *v* from zero to *q*, one obtains increasing total output, but decreasing expected dividend. The former property is the consequence of higher debt levels under higher *v*, cf. (2.3): whereas physical capital *k* is determined "technologically" by the hired manager according to (2.7a), there is less equity to finance it if *q* is diverted towards *v*. Consequently, the firm must borrow more and the debt service component of output goes up. Declining dividends are a consequence of higher debt service. As a result, the firm manager and the shareholders would prefer no collateral diversification at all (at least as long as they do not internalize the effect of their financial decisions on the lending rate). On the contrary, both banks and the GDP-valuing social planner would prefer maximal diversification. However, if the social planner overlooks the systemic consequences of collateral funds being invested in the same type of assets (firm equity directly or through further intermediaries such as the merchant bank in our case), she runs the risk of magnifying a systemic crisis which might emanate from, e.g., an adverse shock to aggregate TFP. Actually, a regulatory omission is easy since, whilst collateral in the form of the firm's physical assets is generally regarded as highly illiquid, window-dressing *v* can create a powerful illusion of collateral liquidity.

Since firms are unable to engage in equity trade of their own, they need expert intermediaries. Intermediaries accumulate assets which, as they may erroneously believe, play the role of risk diversifiers.

Having both equity and debt investment financing is important while we want to consider a case of limited (or, at least, highly elastic) supply of equity capital. That this intention has good grounds can be validated ex post in our setting if one considers a standard stock market populated by traditional small moderately risk-averse equity investors. Then it turns out that in many situations such a market, acting on the usual limited information about the producer technology, is only able to provide for a portion of the needed capital, the rest being necessary to have available as either an exogenous foundation stock, private partnership or bank loan. In other words, quite often, there does not exist an equilibrium based predominantly on publicly traded stock able to complement a small level of private equity participation. These are the cases when a merchant bank can fill the gap.

2.3.6 Merchant banks, equity partnerships

The basic arrangement to be considered here for the merchant bank is to take deposits from both firms. These deposits constitute its liability side. On the asset side, the merchant bank acquires shares of the same two firms in the form of a partnership or private equity participation. One should remember that the abstract merchant bank construction here impersonates the whole global investment banking sector. Inside this aggregate construction with its consolidated balance sheet,

individual institutions hold claims on others from the same set, so that the balance sheets of constituent parts are strongly interconnected. Shin and Shin (2011) argue that growth of these non-core bank liabilities (they also include foreign liabilities in the same non-core group) indicate a nascent credit bubble. This view can be made consistent with our own if we agree that a high weight of non-core bank liabilities is just the reverse side of concentrating non-financial corporate sector non-core (outside collateral in our terms) assets within one highly specialized branch of the financial industry, which is represented by the merchant bank in the model.

Being a big company, the merchant bank acquires a stock sufficient to influence the marginal product of capital in any firm it buys itself into. For simplicity, we assume a risk-neutral merchant bank, as would be natural to expect from a manager of a large enterprise. In any case, risk attitudes of merchant banks are not our prime concern here.

The firm is controlled by two agents: the holder of the foundation stock, which we consider an exogenous initial endowment, and the merchant bank purchasing a partnership. One can think of many variants as to how the stock is split between the two, e.g. depending on the relative negotiation power. Namely, the optimal size of private partnership from the viewpoint of the foundation stock holder is normally smaller than the optimal size from the merchant bank (incoming partner) perspective. In order not to complicate matters with the issue of bargaining between shareholder incumbents and newcomers, we assume throughout that the two are always able to agree on the partnership size that maximizes the producer's expected output when the amount and cost of credit (commercial bank loan size and the lending rate) are given. This is what would happen if the representative shareholder played a symmetric information simultaneous-move game with the firm manager (recall that the latter, in his turn, is assumed to take the equity capital size as given).

We assume that the merchant bank has just one other investment opportunity beside equity partnerships in the two firms. This outside investment has the form of a homogeneous asset paying net return i^0 on a unit of investment. Since, in order not to complicate matters with the merchant bank risk management decisions, we will deal with risk-neutral merchant banks in this chapter, it is irrelevant whether i^0 is deterministic or stochastic. So, we take it to be a mean net return. Recall that the merchant bank and the incumbent shareholder take the borrowing decision of the manager as given. The initial stock q^h given exogenously, and taking into account the first order conditions (2.7) of the production input optimization, they should jointly optimize the size of merchant bank's private partnership, q^p, to satisfy the following simple first order condition:

$$\Phi^{+}\left(A^{d}(q^{h}+q^{p})\right)(1+r)=1+i^{0}. \tag{2.9}$$

Here, the default threshold A^d defined in (6) is considered a function of total equity capital $q^h+q^p=q$ (recall that physical capital is given by $k=b^k+q-v$, v has been pre-defined by the shareholder, cf. 2.5, $b=b^m+b^k$ is chosen by the manager and b^m is pinned down by (2.7b)).

When there are just two ex-ante identical firms, the v value of one becomes the q^p-value of the other, and vice versa. In this chapter, we restrict attention to this symmetric case.

2.4 Calculated equilibria

Let us start with the case in which the merchant bank pays the agreed deposit rate regardless of the performance of its equity portfolio. For instance, this behavior can be rationally expected from it by the firm shareholders (who decide about the deposit amounts) if the government provides full guarantee. That is, we examine, so to say, an "Irish" type of policy.

Given the outside return rate i^0 and the commercial bank cost of funds, i, simple symmetric (i.e. with two identical firms and TFP A being the common aggregate productivity shock) equilibria of our model are pairs of lending rate r and merchant bank partnership size q^p variables jointly satisfying equations (2.7a) and (2.9). The economy is then characterized by fundamentals collected in the last column of Table 2.1 (all values are for one of the two identical representative firms). For comparison, in two additional columns we also show values of economic fundamentals in the cases when collateral diversification is restricted downwards away from the decentralized equilibrium: one with no collateral diversification (v=0) and another with low collateral diversification (v=0.1).

Apparently, total output is not particularly affected by the diversified funds approaching the optimal size. On the other hand, the survival probability increases and the TFP default threshold decreases. This can be attractive from the viewpoint of risk managers within firms, and provide strong support to the use of diversifying financial intermediary services.

An important thing to observe about the results shown in Table 2.1 is the merchant bank performance. Whereas individual firm default probabilities are less than 2% (a little higher if collateral diversification size is restricted) even when their TFP shocks are perfectly correlated, as we assume in this example, the merchant bank makes a negative profit even under a small deviation from the average TFP of unity. This fragility can be somewhat reduced when it is allowed to raise the size of its partnership to the optimal level, but still remains incomparable with those of its client firms: the latter safely survive when their common TFP falls to the level of 0.5, whereas the merchant bank becomes insolvent.

Insolvency of the merchant bank means that the loss must be taken by the government who provided the deposit guarantee. The expected size of official loss conditioned on the aggregate TFP falling below the merchant bank survival threshold, is shown in the last column of Table 2.1. Although it starts at a low level when collateral diversification and the implied leverage are low themselves (because the merchant bank balance sheet size is proportional to leverage), it reaches levels comparable to the economy's aggregate output as soon as collateral diversification moves towards the decentralized equilibrium of the last column. If guarantees must be funded by additional tax revenue, the private sector's net loss from collateral diversification behavior would likely exceed its benefits from optimal capital structure.

If collateral diversification entails such big tail risks to the public sector, can the firms do without it, given that the government may take steps to ban outside collateral altogether? The model suggests that attractions of collateral diversification behavior can be quite strong. One reason is the already mentioned reduction of default frequency in sectors that diversify. Another is even more fundamental and has to do with scarce equity capital.

Our next example concerns a pair of cases in which the foundation equity is lower compared to the q^h=2.7 value considered earlier. Let us allow for the existence of a standard market with the

firm's shares, in which traders are small, risk-averse with negative exponential utility of final wealth, and have alternative investment opportunities beside the discussed firm stock, with an imperfect correlation of returns. The important thing is that these investors do not know the firm production function, just the statistics of its TFP, average revenue and costs, i.e. see the dividend defined in (2.4) as an affine function $Af+g$ truncated at zero due to limited liability at default, with no introspect into the structure of f and g. Being small, they do not internalize the effect of their investment on the firm's earnings (as opposed to the merchant bank with its private equity position). As a first step, we would like to know what amount of equity capital is this set of traders able to provide in equilibrium.

The results for the case of two identical firms in a symmetric equilibrium (i.e. $v=q^p$) are shown in the first column of Table 2.2. We see that the firm cannot be completely financed in the secondary stock market, i.e. there is a minimal positive value of foundation capital q^h for which both equity and credit markets clear. This is a variation of the classical CSV theme: investors without inside knowledge of the firm can provide only so much equity. The needed minimal q^h for the chosen stock market parameters is provided in the column head. As soon as the available foundation stock is lower, public traders are not enough, one needs additional private equity to get the firm operating, and the merchant bank becomes indispensible. In circumstances of scarce private equity, leverage through collateral diversification becomes attractive from the private sector perspective no matter what the public authority knows or thinks about the attached risks.

The first column of Table 2.2 was calculated under the natural assumption that there are no private equity partnerships beside the foundation stock (i.e. $v=0$). We call this case of stock market financing complete. If the number of publicly traded shares is normalized to unity (number in the last line), the penultimate two (equal) numbers of the same column give the total stock market financing and the share price. Next, let us allow for a non-zero participation of the merchant bank (positive v) in the presence of the same stock market. Since, from the stock market trader perspective there is no difference between equity provided in the form of foundation stock and private equity partnership (due to the assumed joint optimality behavior of inside shareholders, expressed by (2.9), only the sum $q=q^h+q^p$ matters), we fix the value $q^h=2$ for definiteness. Then, one can raise the value of v from zero to some level at which the outside stock market becomes redundant, i.e. the optimal level of equity capital $q^*=q^h+v^*$. The 2nd and 3rd columns of Table 2.2 describe the corresponding equilibria for the intermediate case of $v=1$ and the maximal v-level compatible with secondary stock trading (the exact number shown in the column heading).

Actually, the firm can now choose between raising private and public equity capital. In the lower part of Table 2.2 we show two corner alternatives: all-public (denoted *complete* stock market financing) and residual (denoted *incomplete*) public stock trading. Both alternatives are non-trivial only in intermediate cases (since $x^e=0$ when $q^p=q^*-q^h$ same as it was $x^e=1$ when $q^p=0$). We see that for $v=1$, publicly trading stock comprises less than 50 % of shares in the ***Complete*** case and less than 2.5% in the ***Incomplete*** case. For obvious reasons, residual public trading results in a higher stock price than the all-public trading.

Naturally, the size of possible partnership is not limited to the value q^*-q^h. It can grow further, as we agreed in Section 2.3.2, up to the total equity level, which becomes an endogenously determined quantity. This is the case of the entire foundation capital spent on diversified collateral, whereas own production is funded by commercial bank loans. In fact, the amount of deposits

amassed by the merchant bank is now much bigger than required for optimal equity participations. Therefore, we assume for simplicity that the merchant bank invests excess funds outside the economy at the same rate as the one it pays to the firms, i.e. it makes no profit on this part of its portfolio. All profits it can make in expectation come from private equity partnerships. However, with growing deposit size servicing this liability becomes increasingly expensive, so that expected profits fall whereas the merchant bank default threshold in terms of aggregate TFP becomes precariously close to the average TFP value (of unity in our examples). That is, the resulting "crazy" leverage serviced by the merchant bank comes along with an extreme fragility of the latter, which the regulator should by all means prevent.

We go over to the third example which concerns a change in the definition of the merchant bank claims. As mentioned in the introduction, it may be infeasible, even though desirable in principle, to restrict merchant bank liabilities to common equity. So, we try out a hybrid solution that mandates conversion into equity only when the merchant bank becomes insolvent. In this CoCo liability regime, the firms do not have to solve the CSV problem in a high-earning merchant bank. On the other hand, they participate in the debt workout as bona fide shareholders when the merchant bank is in distress, meaning that, in bad times, they simply receive what little the economy (including the firm itself) in aggregate was able to earn, without additional losses associated with the merchant bank dissolution under a standard bankruptcy procedure.

When we say "bad times", this means an intermediate outcome between the failure of the merchant bank and that of the firms. (When aggregate TFP falls below the corporate default threshold A^d, as defined by (2.6), everybody's earnings are zero except for the commercial banks.) As could be seen in the last column of Table 2.1, reproduced as the first column in Table 2.3, the TFP default threshold of the merchant bank is much higher, so there is a whole range of TFP-realizations under which the firms can operate, i.e. repay their loans, even if the merchant bank cannot honor its deposit rate payments.

Complete quantitative results are shown in Table 2.3. Beside the 1st column carried over from Table 2.1, we show a hypothetical case of the merchant bank issuing liabilities in the form of equity only, in the 2nd column. Apparently, the change of legal status of the merchant bank liabilities has a very modest impact on major fundamentals (interest rate, credit, investment, and average output), at the same time as it eliminates, by construction, the huge conditional liability of the government associated with the merchant bank deposit guarantee. However, as mentioned earlier, if pure equity funding of the merchant banking sector is infeasible (e.g. for CSV and other asymmetric information-related reasons), the 3rd column shows a compromise with deposits transformed into equity only when the merchant bank does not earn enough to pay the deposits out in full. Also under this contractual change, most economic fundamentals move only slightly. There is marginally less investment, lower expected output and the lending rate going up by a couple of basis points. The survival probability of both firms same as the TFP default threshold imperceptibly increase. A somewhat more tangible change is visible in the quantity of diversified collateral (it is roughly 30 per cent higher under convertible than under guaranteed deposits), as well as in the default threshold of the merchant bank (it is about 14 per cent lower). Actually, when deposits are convertible, the default as such is not required, so that it is better to talk about the liability transformation threshold. The expected profit of

the merchant bank is also higher in the conversion case than under official guarantees (note that profit is zero by construction in an equity-funded merchant bank). Most importantly, the merchant bank LGD, comparable to the size of economy-wide physical capital aggregate, now disappears, same as the associated contingent claim on the official bailout fund.

2.5 Discussion and conclusion

We have defined a production economy in which attempts to diversify productivity risk on producer (micro) level result in elevated systemic (macro) risk due to the mechanism through which collateral is being transformed into private equity partnerships and concentrated in one sector of the financial industry (merchant banks) with a highly fragile balance sheet.

Merchant banks do not have to be fully competitive. They may pay fixed interest allowing for an economic profit, but still be fragile because what they pay is tied to what their depositors receive as prudential buffers. So, higher/lower buffers mean safer/riskier equity participations in the merchant bank portfolio, but have to be provided by the merchant bank itself in the form of interest payments to the same set of agents. The systemic merchant bank in this setting is not just a gainful enterprise but also a device holding together the equilibrium in the credit market. As such, it cannot make full use of, let alone abuse, its market power. An additional problem of interest in its own right would be of choosing an optimal deposit rate for the merchant bank who internalizes the impact of paid interest on the earnings of firms in its equity portfolio. We postpone this problem for future research but note that even the set of feasible deposit rates in such a problem would be relatively narrow. That is, the merchant bank is constrained in the ability to pay low rate for its funds to such a degree that it turns out to be very moderately profitable and is forced to operate quite close to the default boundary. Its high default probability becomes a natural concern of macroprudential regulation.

Leverage stemming from collateral diversification will hardly be voluntarily reduced to zero by the non-financial private sector since under scarce equity, its presence both provides better managerial incentives in firms and improves welfare. In certain cases, it can even be the only way to allow production financing as standard secondary stock market participation is limited by information barriers on the side of small shareholders.

However, what appears optimal from the micro perspective of a single enterprise can generate poorly sustainable leverage in aggregate. In principle, any amount of leverage reduces distance to default as long as one counts on the possibility of sudden deleveraging based on self-fulfilling collateral reappraisal. Such a reappraisal, in its turn, entails a very probable solvency crisis in the merchant bank sector since, as our examples have demonstrated, default thresholds of the latter are much easier to attain than in a standard non-financial firm. The destiny of investment banks in the US in 2008-9 provides a good example of this.

Policy we know from the latest crisis would, in our environment, roughly correspond to merchant bank bailouts by government funds in order to prevent collateral destruction. This policy entails considerable fiscal costs and soon reaches its limit, as the current sovereign solvency problem in Europe has clearly demonstrated. Accordingly, one should look for alternatives, preferably such that, instead of a futile attempt to transfer losses from sector to sector as a hot potato, would return them to their originators. This is the mechanism of collateral back-conversion into the merchant bank

equity, with which we formally experiment in this chapter. The results suggest that the formal effect of a simple legal status adjustment from plain deposits to CoCo deposits on aggregate economic indicators is likely to be of the second order compared to the quantitative benefit of eliminating the contingent public sector exposure one creates by an across-the-board deposit guarantee.

Convertible bonds instead of government-insured deposits reduce fragility and public loss risk, but preserve both the welfare level and Townsend's (1979) CSV regularity. Quantitatively, in our model firms holding merchant bank CoCos invest and produce almost identically with the earlier government guarantee case (this is, of course, a huge simplification due to our manager risk-neutrality assumption and the primitive merchant bank balance sheet structure), but expected fiscal costs are now zero as opposed to near half-GDP under guarantees.

In a small open economy, the adverse effect of international financial intermediary insolvency can be exacerbated if the real sector is the source of domestic GDP, whereas banks and their regulators are predominantly foreign, implying that they mostly care about gross investment and expected bank earnings on a consolidated basis. For this reason, macroprudential policies targeting a particular pattern of collateral diversification (in the notation of our model this is the ratio of v to q and the structure of the portfolio in which v is invested) can be important for systemic event propagation. In practice, explicit regulation of balance sheet composition of global systemically important financial institutions (SIFIs) is extremely cumbersome and costly for everyone, if possible at all. Therefore, the arrangement based on conversion into common stock can be an enormous simplification for small companies unable to bear legal representation costs in a multinational merchant bank resolution process. An international guarantee of their shareholder rights in the case of a SIFI insolvency is much easier, same as delegation of shareholder rights on a national principle to an official fiduciary agent. That is, instead of a long and uncertain search for a satisfactory international systemic risk containment mechanism, as one can currently observe, e.g. on the G20 level, a stepwise international harmonization based on support of shareholder rights seems a lot more feasible.

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APPENDIX

Table 2.1 Economic fundamentals in a asymmetric equilibrium with fully guaranteed deposits in the merchant bank

v:	0	0.1	0.404991
Lending rate	0.0757712	0.0732556	0.069355
Physical capital	13.6654	13.7408	13.656000
Total equity capital	2.7	2.8	3.104991
Average gross output	17.1668	17.2473	17.156800
Working capital loans	2.55836	2.51444	2.408040
Total loans	13.5394	13.5711	13.379800
Debt service	14.56529659	14.5652591	14.30776
Survival probability, firm	0.901305	0.928249	0.981900
Default threshold, firm	0.319907	0.272727	0.143834
Expected dividend	2.64068	2.81098	3.277320
Expected merchant bank profit	0	-0.00921571	0.00445542
Default threshold, merchant bank	0.98492915	0.98295585	0.623454
LGD of merchant bank	0	5.00129	27.3482

Notes: the foundation equity capital of each of the two identical firms is q^h=2.7. Outside investment rate of return is equal to 5 per cent, same as the merchant bank own deposit rate. The commercial bank cost of funds is 4 per cent. Data are shown for one of the two identical firms. LGD=Loss Given Default. The last column shows optimal private equity participation size.

Table 2.2 Economic fundamentals in the presence of secondary equity market

q^h:	1.0286351	2	2	2
V:	0	1	1.06316	3.06023
	Minimal q^h for which equity finance suffices		*$v=q^p$, i.e. no outside equity needed*	*v=q, max allowed*
Lending rate	0.0675991	0.0683201	0.0683651	0.069773404
Physical capital	13.7016000	13.551	13.5417	13.2554
Total equity capital	3.0679157	3.06337	3.06316	3.06023
Average gross output	17.2055000	17.0446	17.0347	16.7286
Working capital loans	2.3910200	2.38065	2.38001	2.36008
Total loans	13.0247000	13.8683	13.9217	15.6155
Debt service	13.9051580	14.8157836	14.873458	16.705047
Survival probability, firm	0.9835150	0.982852	0.98281	0.981516
Default threshold, firm	0.1379920	0.140426	0.140576	0.145183
Expected dividend	3.3029400	3.28166	3.28035	3.23994
Merchant bank profit		0.04251625	0.04444839	0.01849962

Secondary equity market financing	*Complete*	*Complete*	*Incomplete (q^p-v)*	*Complete*	*Incomplete (q^p-v)*	
q^0	2.0392800	1.06337	0.0633700	1.06316	0	
p	2.0392800	2.33000	2.63417	2.32895	2.65199	
x^e	1	0.456384	0.0240583	0.456497	0	

Notes: the foundation equity capital of each of the two identical firms is q^h=2.7. The outside investment rate of return is equal to 5 per cent, same as the merchant bank own deposit rate. The commercial bank cost of funds is 4 per cent. Data are shown for one of the two identical firms. q^0 is the secondary stock market capitalization, x^e is the number of shares sold in the secondary market, p is the share price.

Table 2.3 Economic fundamentals when merchant bank debt is convertible into equity

q^h=2.7	*Merchant bank deposits officially guaranteed*	*Merchant bank liabilities in equity form only*	*Merchant bank deposits converted into equity when insolvent*
v:	0.404991	0.402676	0.598661
Lending rate	0.069355	*0.069351*	0.0697665
Physical capital	13.656000	*13.6569*	13.5779
Total equity capital	3.104991	*3.102676*	3.298661
Average gross output	17.156800	*17.1577*	17.0733
Working capital loans	2.408040	*2.40809*	2.40342
Total loans	13.379800	*13.3807*	13.2969
Debt service	14.30776	*14.308665*	14.224578
Survival probability, firm	0.981900	*0.981904*	0.981523
Default threshold, firm	0.143834	*0.14382*	0.145161
Expected dividend	3.277320	*3.27744*	3.26608
Expected merchant bank profit	0.00445542	*0*	0.117892
Merchant bank profit under unit TFP	0.00366253	*0*	0.00498064
Default threshold, merchant bank	0.623454	*0*	0.546639
Expected revenue on diversified collateral	0.42746826	*0.425357475*	0.414181
LGD of the merchant bank	27.3482	*0*	0

Notes: the foundation equity capital of each of the two identical firms is q^h=2.7. Outside investment rate of return is equal to 5 per cent, same as the merchant bank own deposit rate. The outside investment rate of return is equal to 5 per cent, same as the merchant bank own deposit rate. The commercial bank cost of funds is 4 per cent. Data are shown for one of the two identical firms. LGD=Loss Given Default.

Chapter 3

REFORM OF EXISTING AND BUILDING OF NEW INSTITUTIONAL STRUCTURE OVER THE COUNTER FINANCIAL DERIVATIVES MARKET

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REFORM OF EXISTING AND BUILDING OF NEW INSTITUTIONAL STRUCTURE OTC FINANCIAL DERIVATIVES MARKET

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Abstract

The financial crisis which occurred during 2008 has shown that markets are OTC (over-the-counter) derivatives unregulated and insufficiently controlled and represent a potential source of systemic risk build up. At summits in Pittsburgh G20 leaders by made binding recommendations for the reform of the existing buildings and the new institutional structure of OTC financial derivatives market. Recommendations are relating to the standardizations of contracts, mandatory central clearing of all transactions, trading across exchanges or electronic platforms, capital and margin requirements and reporting through trades repositories. Analogously, the proposed recommendation at the international level, the FSB is on undertaken is of initiatives, together, with other relevant international organizations with improved order to existing building and new proposals and measures. FSB has announced the first report after consulting relevant stakeholders on the OTC market of financial derivatives revised and adopted in final form at the G20 summit (2011) in Cannes.

US and EU and other countries have taken appropriate actions and measures to implement the proposals and recommendations by Pittsburgh Summit. The US has adopted Dood-Frank Act, which in Section VII regulates OTC derivatives, with final implementation 15 July 2011. EU has adopted EMIR, as the main regulators, whose provisions are binding on all jurisdictions and its implementation will commence by of end 2012. The new structure of OTC markets should be reduced systemic risk and improve the risk management contracting partners, to ensure transparency and improve the financial infrastructure of derivatives markets.

Keywords: OTC financial derivatives, standardization, central clearing, exchange or electronic platform trading, trade repositories systemic risk.

3.1 Introduction

In light of the recent economic and financial crisis, identified hazards and threats of the unregulated trade OTC financial derivatives market. The enormous expansion of OTC financial derivatives market after the seventies and early eighties of the last century past and having reached the culminations of several years before the crisis, during the crisis, showed certain regulatory and supervisory deficiencies. Nevertheless, although proven that they are not the main cause of the great financial crisis; they have no doubt contributed to its eruptions. Failure firm Lehman Brothers and AIG rescue because of exposure revealed that the OTC derivatives market financial source buildup of systemic risk. The crisis has shown that improper use of financial derivatives by financial and other stakeholders in the search for new crops can cause financial problems, while turning them into "financial weapons of mass destruction." "The mass destruction" comes from the very characteristics

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of OTC derivatives and financial derivatives markets. These characteristics allow, their, strong mutual flexibility and adaptability, which along with inadequate regulation and supervision can evoking a powerful, combined, the synergy that stimulates investors to constantly search for new financial derivative products that provide them with a new, higher yields. Retail unregulated OTC financial derivatives markets, is performed bilaterally, (phone) or multilaterally (placing electronic platform) contract between business partners without clearing obligations of and disclosure of data of the type of contracts, prices, and transaction report without obligations of, and enforcing contracts. Such trade was not available to the authorities responsible for monitoring and supervision and the only legal framework was the contract itself. Enormous trade non-regulated unregulated market and strong synergies of the combined effect of derivatives and OTC financial derivatives markets, strongly acted, to spreading financial contagion has already occurred in the US.

Identified negative effects of unregulated OTC financial derivatives market, noted that it is necessary to take certain actions, the direction, the revision of the existing structure and build a new OTC financial derivatives market. Failure of OTC financial derivatives markets is the Pittsburgh Summit, G20 leaders, (2009) the passing of a binding recommendations for increased regulation and oversight of OTC financial derivatives markets "all standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest". Financial Stability Board (FSB) in accordance with the mandatory recommendations of the G20 leaders took certain actions (FSB, October 2010) in order to improve existing and build new structures OTC financial derivatives markets, focusing primarily on control deficiencies which have come after the recent crisis. In this way, they run international efforts and mechanisms to strengthen the regulatory and supervisory framework of OTC financial derivatives market.

The aim of this chapter is to, on the basis of the initiative group G20 and other relevant international organs regulations, to show in main aspects a new regulatory and supervisory structure of OTC financial derivatives markets, their structure, differences, practical's and policies implications and problems of application.

The contribution will be reflected in the presentation of the current problems a wide public as an initial idea to deepen their thinking to finding new solutions and improvement criticism existing and new of the regulatory and supervisory framework of OTC financial derivatives market.

The work consists of seven sections. The first section gives a brief review of the realized financially derivatives trading volume on the OTC market. The second section focuses on observing the role of derivatives in the recent financial crisis. The third section focuses on an international initiative to improve existing and build a new architecture of the regulatory and supervisory framework of OTC financial derivatives markets. In the fourth and fifth section we focus on the application of international initiatives in the US and the EU, their actions and activities. In the sixth, outlines compare the differences and similarities of the regulatory and supervisory framework of the US and the EU. In the seventh section considers the implications of the new framework of regulation and supervision on OTC entire financial sector and financial institutions. Instead of conclusions, we points to the problems of successful implementation of the new regulatory and supervisory framework, international coordination, and progress to date in the realization.

3.2 Development of over the counter financial derivatives markets

Trades of financial derivatives are to 1998 increased from 72 billion dollars to 684 billion dollars to June 2008 before the crisis. High growth has been achieved, in most cases, to the unregulated OTC markets which recorded of by 2008 or 85% total. In the years of the fiercest economic and financial crisis trade OTC financial derivatives recorded a decline and stagnation. In the first half of 2011, the OTC financial markets are showing signs of recovery and trade has increased by of 601 billion US dollars in December 2010 to 707, 6 billion dollars, or 17.7%. At the same time, actual growth exceeds the period of year 2008 by 5, 2%, when the highest trading volume of 672.6 billion dollars. The second wave of the crisis, known as the debts crisis, especially in the euro zone have to affected the decline on the volume of trading on the OTC financial markets derivatives in the second half of 2011 on the 647.7 billion dollars, an increases of 10% in compared to the first half year 2011 or 4, 7% less than in 2008. (Momirovic, Banker, 56) In relation to the year 1998, noted an excellent growth of 890%.

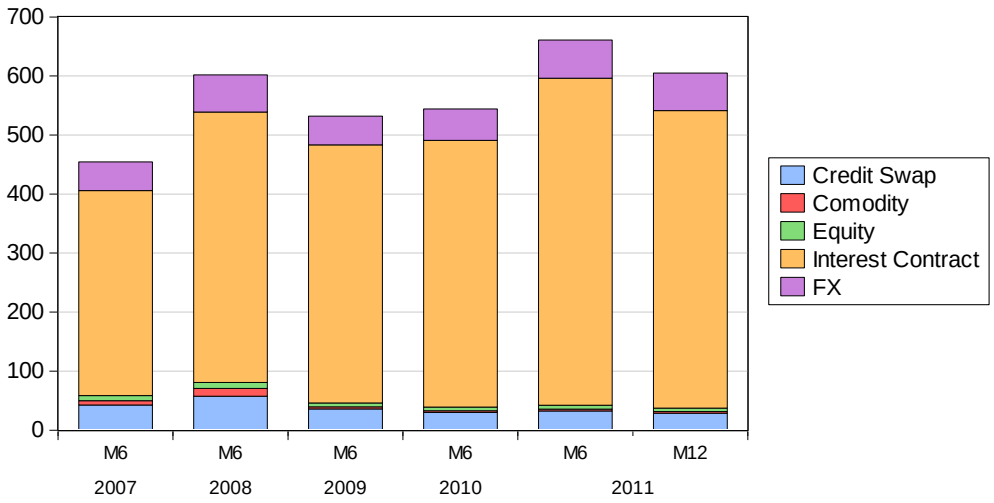

Figure 3.1 Volume of trading derivatives market ($ trillion)

Source: BIS-Bank of settlement and payments

3.3 Rule of derivatives in the financial crisis

The initial shocks of the crisis caused by the securitization on the financial markets of the US have not escaped the market OTC financial derivatives markets. Regardless, they are the main carriers of the causes of the crisis; however, the crisis has revealed some weaknesses in the structure of these markets, particularly in certain types of CDS, which influenced the increased build-up of systemic risk.

The crisis has shown that in certain situations-combined effect of the themselves characteristics that make the derivatives (Individual lever), and OTC financial derivatives market (a high degree of adaptability, lack of transparency, high market concentration, high correlations large market participants and the lack of regulation) so attractive to can have devastating consequences for the financial system (Regulation of the European Parliament and of the Council on OTC derivatives, central counterparties and trade repositories 2010) The combined effect of OTC derivatives and

financial derivatives markets were operating, the instigating of the financial crisis in the US, especially channel CDS contracts.

3.4 International regulatory initiative financial derivatives markets

Beatar Stearns collapse in March 2008, Brothers and Leman same year in September and rescues of AIG bail a day later; he pointed to the failures and shortcomings of the functioning of OTC financial markets derivatives. Identified failures and deficiencies relating to the lack of transparency, risk exposure and inadequate limit and mitigate credit and operational risk. Developments and identify failures OTC financial derivatives markets are strongly influenced to the co-ordinate approach to solving accumulated problems initiative by of leader G 20 at a summit in London 2. April 2009. G20 leaders agreed that the urgent reform of OTC financial derivatives markets, through standardization and strengthening resilience with a particular focus on the establishment of a central clearing counter partners in order to provide more effective regulation, monitoring and supervision.

At the Pittsburgh Summit (September 2009) G20 leaders expressed their determination and took a firm stand to strengthen the regulation, supervision and oversight of OTC financial derivatives market, ordering that "all standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest. OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements. We ask the FSB and its relevant members to assess regularly implementation and whether it is sufficient to improve transparency in the derivatives markets, mitigate systemic risk, and protect against market abuse". (The Pittsburgh Summit, 2009)

Analogously, firmly expressed position G20 and obtained the guidelines, the FSB has initiated the formation of a working group (establish in April 2010) at led by representatives of the Committee on Payment and Settlement Systems (CPSS) the International Organization for Securities Commission (IOSCO) and the European Commission with a mission to identify and recommendations that support the consistent implementation of the objectives of the G20 leaders. Analogously, firmly stated attitude G20 and obtained the guidelines, the FSB has initiated the formation of a working group (established by in April 2010) with representatives of the Committee on Payments and Settlement Systems (CPSS), the International Commission for the organization of the securities (IOSCO) and the European Commission (EC) under the called, OTC Derivatives Working Group with a mission to identify options and recommendations that support the consistent implementation of the aim of the G20 leaders. It focused on common approaches to OTC derivatives market reforms to achieve consistency in implementation across jurisdictions, while promoting greater use of OTC derivatives products in standardized form and minimizing the potential for regulatory arbitrage. (FSB, 2010)

OTC Derivatives Working Group, in accordance with the commitment made by G20 report, which cited twenty-one recommendations, which contain practical problems they may encounter in implementing the goals of the government G20 commitments in terms of standardization, central clearing, organized platform trading, and reporting of OTC derivatives to trade repositories. (Technical

Committee of IOSCO, 2011) FSB has adopted the report of the Working Group and forwarded for consideration by the G20 leaders at the Seoul Summit in November 2010.

FSB in its report "Implementation of the reform of OTC derivatives markets" (October 2010) noted that it is necessary to join the IOSCO work together and with other bodies, as appropriate, coordinate the implementation of central clearing on the level of the derivative products from the perspective of the participants or G20 recommendations.

IOSCO is in accordance with the requirements of the FSB, established an in October 2010, Task Force on OTC Derivatives Regulation, (IOSCO Task Force) and to coordinate joint efforts in the development work of monitoring, control surveillance and supervision relating to OTC derivatives. IOSCO Task Force is trying to build a financial infrastructure and "develop international standards related to OTC derivatives regulation, coordinate other international initiatives relating to OTC derivatives regulation, and serve as a centralized group within IOSCO through which IOSCO members can consult and coordinate generally on issues relating to OTC derivatives regulation "(Joint Reports, 2012)

In the meantime, the IOSCO and prepared a report containing recommendations for the establishment of the order of the clearing by the competent authorities in their respective jurisdictions. Recommendations relating to the following: (IOSCO, 2012)

- Determination of whether a mandatory clearing obligation should apply to a product or set of products;
- Consideration of potential exemptions to the mandatory clearing obligation;
- Establishment of appropriate communication among authorities and with the public;
- Consideration of relevant cross-border issues in the application of a mandatory clearing obligation; and
- Monitoring and reviewing on an ongoing basis of the overall process and application of the mandatory clearing obligation.

In the context of the recommendations, the FSB and IOSCO suggests two approaches to defining the obligations mandated choice product or group of products that should be subject to mandatory clearing, as follows: (IOSCO, 2012)

- The bottom-up approach considers products that a CCP proposes to or is authorized to clear;
- The top-down approach considers products that should be assessed for a mandatory clearing obligation, but where there may be no CCP clearing or seeking to clear that product.

Key levers FSB report for the summit in the village can be elaborated in four points:

1. Standardization;
2. Central Clearing;
3. Stock exchange or electronic trading platform;
4. Reporting of OTC transactions in trade repositories.

3.4.1 Standardization

Implies an increasing proportion of standardization of OTC contracts increased central clearing and trading on exchanges and trading platforms in order to mitigate systemic risk and improve transparency. Standardization recommendations from the report are: (FSB 2010)

- Authorities should work with market participants to increase standardization of OTC derivatives products' contractual terms. In setting priorities for increased standardization of contractual terms, authorities should consider the systemic relevance of particular types of OTC derivatives products, including by assessing factors such as volumes and exposures;
- Authorities should work with market participants to increase the proportion of the OTC derivatives markets that uses standardized operational processes and straight through-processing. Greater use of standardized, automated processes will promote the use of standardized products;
- To achieve increased standardization of contractual terms and greater use of standardized operational processes as set out in the above recommendations 1 and 2, the OTC Derivatives Supervisors Group (expanded to include relevant market regulators) (ODSG) should continue to secure ambitious commitments from the major OTC derivatives market participants. These commitments should include publishing a roadmap by 31 March 2011 with demanding implementation milestones for achieving greater standardization and, as an interim measure until mandatory clearing requirements are fully implemented, increasing volumes of centrally cleared transactions. The roadmap should set forth baseline metrics and forward-looking targets against which market participants will be measured;
- Authorities should develop incentives and, where appropriate, regulation, to increase the use of standardized products and standardized processes. Authorities should examine new market activity on a regular basis to monitor the extent to which market participants may be trading non-standardized contracts solely for the purpose of avoiding central clearing and trading requirements and take steps to address such behavior.

3.4.2 Central clearing

FSB has identified a wide range of factors that would suggest the possibility of establishing a clearing obligation, which can be summarized in three groups: (Sidanius and Wetherilt, 2012)

- The degree of standardization of a product's contractual terms and operational processes;
- The nature, depth and liquidity of the market for the product in question;
- The availability of fair, reliable and generally accepted pricing sources.

At the same time, the recommendations proposed mandatory clearing requirements, as well as, and strong requirements for risk management remaining un-cleaned central markets regulation and supervision of the central rating (CCP).

3.4.3 Exchange or electronic platform trading

In the future, need to identify all actions that may be of importance for the realization of the obligations for trading on the stock exchange or through standardized contracts trading platform. Recommendations concerning: (FSB, 2010)

1. IOSCO, with involvement of other appropriate authorities, should conduct an analysis by 31 January 2011 of:
    - The characteristics of the various exchanges and electronic platforms that could be used for derivatives trading;
    - The characteristics of a market that make exchange or electronic platform trading practicable;
    - The benefits and costs of increasing exchange or electronic platform trading, including identification of benefits that are incremental to those provided by increasing standardization, moving to central clearing and reporting to trade repositories;
    - And the regulatory actions that may be advisable to shift trading to exchanges or electronic trading platforms;
2. Authorities should explore the benefits and costs of requiring public price and volume transparency of all trades, including for non-standardized or non-centrally cleared products that continue to be traded over-the-counter.

3.4.4 Reporting on trade across repositories

The authorities need to have a global view of the OTC financial derivatives market, the full and timely access to information necessary for the exercise of their powers. The recommendations are:

- The government should establish a legal framework and to provide the basic functions of trade repositories including data collection and comprehensive reporting with the implementation of international standards developed jointly by CPSS and IOSCO;
- Provide access to information for all markets both domestic and foreign regulators (monitoring, supervision, effective resolution etc.) to an appropriate form and in accordance with their mandate;
- The authorities should ensure that where appropriate the legal framework in removing barriers to data collection and dissemination of trade repositories and provide ready access to the relevant authorities. This approach will be applied where there is no consensus rating for regulatory reporting;
- The authorities should ensure where necessary, the legal framework in removing barriers to data collection and dissemination of trade repositories and provide unhindered access the relevant authorities. This approach will apply where there is disagreement rating for regulatory reporting;
- The authorities need to OTC market participants from financial derivatives that require to report all transactions, including, in addition, those who have reverted to central clearing, as well as to preserve the information about them, regardless of whether it is carried out and trade them to recorded and communicated in their reports;

- The authorities should determine the catch reporting transactions on realized trade repositories, and relevant organizations in charge of reforming the OTC financial derivatives market to determine what information should be reported, in order to enable the authorities to carry out their duties of monitoring, surveillance, monitoring and control.

At the same time, it should be easy to develop a methodology for collecting data on the global level by the end of 2011 by the CPSS and IOSCO in consultation with the authorities ODRF with the minimum requirements of formal standardization. The recommendations help achieve this objective, including that trade repository data must be comprehensive, uniform and reliable and, if from more than one source, provided in a form that facilitates aggregation on a global scale. (FSB, 2010)

The report contains ambitious targets, in line with the commitments made by the G20, including deadlines and law enforcement. It identifies areas in need of constant research and monitoring giving you in mind the constant progress of innovation of financial derivatives which can seriously undermine the G20 initiatives and efforts of relevant organizations working on the regulation of OTC financial derivatives market. Constant research and monitoring require additional recommendations from the relevant institutions and authorities to set objectives.

At a summit in Seoul (November 2010), G20 leaders discussed the first report on the progress and implementation of the reform of OTC financial derivatives market. G20 leaders have adopted the recommendations of the FSB, with a request to continue monitoring the progress of reform and for the month of March 2011, prepare an initial report on the implementation of these recommendations. FSB report, as of April 2011, explains and discusses a number of issues that are of importance for the implementation of the recommendations in a consistent and comprehensive way, and shows that the implementation is at an early stage and that cannot be given relevant conclusions about the visible progress. The body of this report is set out in two parts: (i) implementation by jurisdictions and progress in international bodies' work streams; and (ii) overall observations on progress, including identification of issues meriting additional attention in the near term, and next steps. (FSB, 2011) At the same time, the FSB has expressed some doubt when it comes to the likelihood of implementation in some jurisdictions, remaining, in the belief that the goal can be achieved only with the full involvement of the competent authorities, in terms of taking concrete actions.

In October 2011, FSB has released its second report on the progress of the reform of OTC financial derivatives market. The report highlighted a detailed assessment of progress in implementing reforms, as well as concerns about the speed of implementation of regulations, stressing the importance of cooperation, regulatory bodies and government. In parallel, the FSB believes that it is a priority increasing the dynamics of legislative and regulatory actions, so that as soon concretize binding framework. At the same time, the authorities were obliged to take as soon as quick and effective action in order to meet the deadlines given in the implementation of all defined areas including, at the same time, judicial and policy decisions related to the organization of the trading platform. It points to the consistency and application in order to avoid overlap gaps and conflicts of legislative and regulatory framework. In this context, it is proposed to continue discussions among participants in the reform, with a particular focus on bilateral or multilateral relations among jurisdictions, insisting, at the same time, the consistency between them. The consistency is reflected in the implementation of international standards that would directly solve the problems in case of

financial distress, or begin the process of international cooperation in alleviating and limiting the spread of financial contagion. ODVG and FSB will continue to monitor the implementation of the reform of OTC financial derivatives market. FSB will continue to encourage the full and consistent implementation of the commitments the G-20 leaders through the "development of international standards, the adoption of legal and regulatory framework and changes in market structures and activities". (FSB, 2011)

At the Cannes Summit (November 2011) G20 leaders have accepted the recommendations of the final declaration of the FSB, in the reform of OTC financial derivatives market, "We endorse the FSB progress report on implementation and ask the CPSS and IOSCO to work with FSB to carry forward work on identifying data that could be provided by and to (TRs), and to define principles or guidance on regulators' and supervisors' access to data held by (TRs). We call on the (BCBS and IOSCO) together with other relevant organizations to develop for consultation standards on margining for non-centrally cleared OTC derivatives by June 2012, and on the FSB to continue to report on progress towards meeting our commitments on OTC derivatives". (Joint report, 2012, p. 14) At the same time, the summit requested IOSCO to analyze and assess the functioning of the credit default swaps market (CDS). At the same time, leaders of the G20, as part of its agenda, supported the recommendations of IOSCO (listed above), in the sense of improving regulation and supervision of commodity derivatives markets. In addition, they agreed that regulators should be given effective powers (powers effective resolution) to be able to react in time and minimize or prevent financial distress in the market OTC derivatives. The conclusion of the summit was to reform the OTC derivatives market is one of the key issues in building a new architecture of regulation and supervision in order to provide more resilient and stable financial system.

3.5 Implementation and application of international initiative in United States

Reform of OTC financial derivatives in the US is initiated by the adoption of the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) 21.07. 2010, that, in Section VII, provides the federal level, the establishment of a new framework of market regulation of swaps and security-based swaps (security-based swap), which is expected, when fully implemented, fundamental changes in the functioning of the market swaps. The law is due to come into force on 16 July 2011, but its implementation was delayed in late 2012, although the previously proposed date of implementation, some provisions apply.

Chapter VII, Dodd-Frank Act contains many elements that affect OTC derivatives, but these are the key areas, namely: (Chance, 2010)

- Registration of swap dealers and major swap participants;
- Push-Out Rule;
- Swap clearing and execution;
- Swap reporting;
- Margin;
- Volcker Rule.

In the Dood-Frank Act regulation and supervision of the Commission to trade commodity futures (CFTC), was given the authority and responsibility over swaps, swap dealers and major swap

participants. Commission for Securities (SEC) is responsible and accountable for the security-based swaps, as well as dealers and companies that are major participants in the OTC market of derivatives. CFTC and SEC will cooperate and work together in order to solve certain problems related to the definition of the key aspects of competence, issues of market intermediaries, as well as the adoption and approval of regulatory legislation in the field of joint, mixed swaps, regulations, statistics of trade repositories, solutions in the field of bookkeeping and records for swap entities from the security point of major swap agreement. They are required to consult with the Federal Reserve Board (FRB) when it comes to rules that are not common but also with other prudential regulators regarding capital and margin rules. Also, they are constantly in consultation with the prudential regulators outside the United States established in accordance with international standards of regulation and supervision of OTC financial derivatives market.

This law established several new regulatory designation for participants to trade swaps. Broker-dealers who make markets swap products must be registered as Swap Dealers (SD) with the CFTC or recalls, or in both, depending on with whom swaps are traded. The Major Participants Swaps (SME) is firms that have important positions in the trade or swap multiple clients, such as large asset managers.

CFTC and SEC rules establish by the CCP for registration in accordance with the basic principles of the Dodd-Frank Act. As a clearing agency may be registered by anyone who meets the legal requirements and standards prescribed by the SEC. Registered clearing agency must have a responsible person who will strictly adhere to established rules and submit annual and other reports. Clearing agency must abide by certain rules and principles in their operations, such as, respect, appreciation of participants and the suitability of products, risk management, problem solving and conflict resolution, reporting, record keeping, public information, etc...

Push-Out Rule provides that cannot be provided federal financial assistance to any Swap Dealer or Major Swap Participants. This prohibition would not apply to the FDIC deposit insurance institutions and their activities are limited swaps, hedging and other risk management activities related to their own activities and act as swap dealers in transactions involving rates (rates) or reference assets that National Bank may invest. (ISDA, 2011,) Push-Out Rule restricts trading in derivatives depository institutions (banks), and forbid them to act as swap dealers for default credit swaps, unless the conduct swaps, cleared through clearing. At the same time, it enables banks to act as dealers in the swaps interest rates, foreign exchange swaps, swaps and precious metals swaps cleared default credit reference investors.

Regulators require that all products are considered to be subject to the swap clearing, filing Derivatives Clearing Organization (DCO). In this way, it ensures the safety of the clearing house to eliminate the risk of exposure. In spite of all regulatory efforts, not all swaps are eligible for clearing.

Trade clearing swaps must be executed on registered trading places, including Designated Contrast Market (DCM) or Swap Execution Facilities (SEF). The CFTC and SEC are based on the published final regulations in January 2012, established a system of recording transactions, which must be registered and reporting system swap shop. Reports and registration data pertaining to transactions subject to the clearing exchange or registered SDRs, DCOs, DCMs, SEFs, SDs, MSPs, and non-SD/MSP counterparties. (Join report, 2012) At the same time it requires that all data related

to trade swaps, are available to the general public through timely and complete reporting. Reporting should include data from two important phases of existence swap, first, in the process of creation and other swaps, tracking the movement of the swap until the final termination or expiration. Timely reporting will improve price transparency and other important variables.

Trade repositories are included in the Dodd-Frank's Act, which gives the discrete powers of the CFTC and SEC, unless otherwise specified, in accordance with the rules and regulations established mode of operation of TR. It should be observed that some of the following measures: (Join report, 2012)

- Acceptance, confirmation, and maintenance of data;
- Provision of direct electronic access to the CFTC or SEC, as applicable, or any designee;
- Establishment at the direction of the CFTC or SEC, as applicable, of automated systems for monitoring, screening, and analyzing data;
- Maintenance of the privacy of any and all transaction information;
- And, sharing of data on a confidential basis with certain specified entities or those determined to be appropriate, upon request and after Commission notification.

Concurrently, the TR should consider anti-seismic occurrence, management arrangements and conflicting interest. Dodd-Frank Act requires the execution of “swaps that are required to be cleared to occur on a DCM or a registered or exempt SEF (in the case of swaps) or an exchange or a registered or exempt security-based swap execution facility (“SBSEF”) (in the case of security-based swaps), unless no such entities make these swaps available to trade”. (Join report, 2012) In some cases compulsory execution request swap contracts are not subject to Dodd-Frank law. These cases relate to trade swaps on unorganized markets, the possibility of executing swaps that can allow trade and swap if the end-user exempt from the clearing.

In the same act, exposed are the requirements of prudential regulation relating to capital, margin, or collateral, risk management, liquidity, and segregation. Capital requirements are designed to provide sufficient liquidity firms to fulfill their contractual obligations without external arbitration and major conflicts. Minimum requirements apply, the amount of margin, or collateral, especially in the collateral that is greater than the margin of scale, with the desire to provide a sufficient amount of financial resources to ensure the implementation and enforcement of contracts protect swaps dealers from price changes and other unforeseen circumstances, such and assist in managing risk. The problem is to "perfect the lien against the collateral." (Miller, 2009) Therefore, SFTC and SEC have the authority to regulate its activity minimum requirements for capital and margin requirements for swaps subject to the clearing. Have a higher risk swaps that are not in the clearing, and the Dodd-Frank law envisages the possibility that SFTC, SEC and prudential regulators set minimum capital margins that will "(1) help ensure the safety and soundness of the registrant; and (2) are appropriate for the risk associated with the uncle a red Swaps they hold”, help ensure the safety and stability of the registrant and respond to risk non-clearing swaps." (Join report, 2012) At the same time established the requirement for collateral, which is made clear that collateral, must be separate from the accounts or assets that should be used for one customer collateral to cover the obligations of another customer or its own obligations.

Volker rule prohibits insured depository institutions to engage in the trade for its own account, is: (skadden.com).

- Engaging in proprietary trading;
- Acquiring or retaining any equity, partnership or other ownership interests in hedge funds or private,
- Or sponsor a hedge fund for private equity fund.

This rule applies to all US banking institutions wherever they have activities or conduct trade.

Regulators, in addition to prescribing norms and sanctions behavior of participants in the OTC derivatives market, financial, and have responsibility for the operation of the market. Accountability refers to the discrete harmonizing rules and regulations, in accordance with the Dodd-Frank Act requires the commission relating to the monitoring of TR, preventing manipulation of swaps, get information, secrecy and integrity of financial transactions, timely reporting, analysis anti- seismic conflict resolution, records and the like.

At the same time, Dodd-Frank Act contains many different aspects that will affect the organization of business and technology firms that trade derivatives swap with and be subject to the clearing of OTC derivatives. Operational and technological impacts may include central clearing of OTC transactions, bilateral margin, segregation of collateral Parties, reporting on the transactions and the like. The regulatory and supervisory framework Dodd-Frank Act, should: (Joint Report, 2012)

- Provides for the registration and comprehensive regulation of swap dealers (“SDs”), security-based swap dealers (“SBSDs”), major swap participants (“MSPs”), and major security-based swap participants (“MSBSP”);
- Imposes clearing and trade execution requirements on Swaps, subject to certain exceptions;
- Creates recordkeeping and real-time reporting regimes; and
- Enhances the Commissions’ rulemaking and enforcement authorities with respect to certain products, entities, and intermediaries subject to the Commissions’ oversight.

3.6 Implementation and application of international initiative in European Union

Since the outbreak of the crisis, the European Commission, among others, devoted considerable attention to the regulation of OTC financial derivatives market. As of October 2009, the Commission is actively working on finding solutions OTC financial derivatives markets, focusing on short notice to CDS markets in order to build and start work clearing trade in Europe and in the medium term, systematic monitoring of derivatives. Commission, 3 July 2009, "passed the first communication that examines the role that derivatives played in the financial crisis, look at the benefits and risks of derivatives markets as well as evaluating the identified risks have been reduced," and other communication, October 20, "said that the future political activities of the Commission , which aim to suggest, increasing transparency, reducing the risk of contracting partners and operational risks, enhance market integrity and oversight on derivatives markets "(Regulation of the European Parliament and of the Council, COM (2010) 484)

The European Council (EC) is, by analogy, the recommendations of the G 20 in Pittsburgh issued a second conclusion December 2009, the need to revise the existing regulatory framework,

OTC financial derivatives market, in order to mitigate credit risk, improve transparency, liquidity, efficiency and strengthen market integrity. The legal basis for the implementation of the proposal concluded EC Regulation defines the 114th, Treaty on the Functioning of the European Union (TFEU). Regulation is considered to be the most appropriate legal instrument to directly introduce a mandatory requirement for all participants in the standardization of OTC financial derivatives clearing through CCP and ensure that CCP take the consequences and significant concentrations of risk is subject to uniform prudential standards of the EU. (Regulation of the European Parliament and of the Council, COM (2010) 265)

September 2010, The European Council issued the act proposed by the European market infrastructure regulation (EMIR) which, unlike the directive, has the force of law, and the endorsement cover all jurisdictions in the EU. EMIR proposal contains requirements to increase transparency and reduce credit and operational risk. At the same time these requests seek EMIR: (Joint Report, 2012)

- Reporting of derivatives transactions to TRs and creates a new regulatory framework for TRs;
- Clearing of eligible OTC derivatives through CCPs and enhances the existing regulatory framework for CCPs;
- Measures to reduce counterparty credit risk and operational risk for bilaterally transacted OTC derivatives.

Proposed regulation after publication of OTC financial derivatives markets by the EU Council and the European Parliament have repeatedly revised proposal EMIR, as part of the legal process, in a sense, solving some different views, but by the end of 2012., ultimately shape the law, Commission in December 2010, published a public consultation on the revision of the Markets in Financial Instruments Directive (MiFID) insisting comment on a draft revision of several existing directives, including the revision of the directive proposal OTC financial derivatives, requiring that certain OTC trading of financial derivatives is done on the stock exchange or electronic platform. In October 2011, the EC published two draft proposals - one for revising MiFID[19] (Revised MiFID) and the other for creating a new regulation entitled the Markets in Financial Instruments Regulation (MiFIR) together with EMIR, "EU Regulations. (Joint report, 2012)

After several discussions and review of legislative proposals, the Commission for the regulation of OTC financial derivatives central contracting parties and trade repositories, European Commission, European Parliament and European Council reached political agreement on 9. March 2012, on acceptance of bills EMIR to make it 29th March 2012, The European Parliament formally adopted. EMIR decree adopted on regulating OTC derivatives are fairly stringent, as imposed through central clearing CCP with the underwriting obligation of the contracting parties, as well as enforcing financial obligations of the non-solvent. Clearing members are required to pass a certain amount of money to cover the initial margin, which are designed to cover the changes that can occur in market values, and to serve as a buffer to cover the loss. Each CCP should have special financial fund contributions of its members. Altitude contribution margin and CCP will be measured and determined on the basis of liquidity and credit ratings of each member of exposure and cost, requiring constant

[19] The revised MiFID and MiFIR and relate to a wide range of financial instruments, including OTC derivatives. The revised MiFID includes provisions for providers of investment services, investor protection, reporting, etc... MiFIR provisions include OTC transactions through the disclosure of trade, trade execution required in commercial areas, control activities and the elimination of trade barriers between providers and clearing services.

adaptation to specific situations. Segregation includes the so-called obligation "individual client segregation" where assets and positions of every client should be distinguished from those that were withheld for another client, (Smith, 2012). Further, it implies that the client is not exposed to losses due to other positions; however, it should be provided timely return of his assets after the insolvency of a clearing member.

Clearing obligations will be determined on the basis of the adopted two approaches "a top-down", according to which the ESMA on its own initiative in consultation with the European Commission for systemic risk (ESRB) to assess whether mandatory clearing applied to a derivative that CCP has no power and access to the "bottom-up", where the CCP, in accordance with national super-auditors can decide which contracts will be subject to mandatory clearing.

Standardized OTC derivatives contracts, which are traded on organized markets will be subject to mandatory clearing through CCPs, as opposed to the revocation of which will require more collateral. The argument that the collateral may concentration could cause risk, resolved by strict prudential supervision, and strengthening organizational and commercial risk management with CCP. Strict technical standards that are preparing to remove these doubts.

All derivative contracts, including OTC derivatives, in the future must be logged in and registered with the central trade repositories[20], in order to provide monitoring and control. Models are exceptions to the mandatory clearing (CCP) related, the pension funds for a three-year, non-financial firms that are below the "clearing threshold" and has some specific circumstances (hedging activities of the Treasury, intra-group transactions). ESMA, ESRB and other relevant authorities are obliged to do the draft technical standards "clearing threshold". Complex derivative products will remain without a central clearing to additional regulations implementing Basel III will be subject to higher regulatory capital charges and other credit risk mitigation procedures risk. (Smith, 2012)

Be sure the timely reporting of trade, improving transparency. In addition, EMIR will focus on the post-trade OTC derivatives and other, unresolved aspects of regulation, cooperating with all relevant authorities and regulatory bodies. Given that the regulations are taken in the form of EMIR regulation, it will require implementation in national legislation but will be directly binding on member states. (Smith, 2012) At the same time, the EMIR should be viewed in the broader global dimension, especially within the recommendations of the Pittsburgh Summit 2009, in the context of the G20 commitments to implement strong measures of control and building a new structure of OTC derivatives.

In light of the overall changes in the regulatory ESMA shall prescribe rules for the formation of new markets and shopping centers in the central database where the participants of OTC financial derivatives markets will be required to register all their transactions. Registered derivatives transaction classification is by classes, in order to provide greater clarity and access to interested vendors. Application of ESMA is expected after the full adoption of technical standards, drafted 16th published February 2011, in the form of a consultative document entitled "Draft Regulation on technical standards OTC derivatives, CCPs and trade repositories".

[20] In the trade repository must be registered financial firms, banks, insurance companies, funds, etc... and non-financial organizations (companies-energy, manufacturing, etc.) which have a large share in the sale of derivatives

The final text of the Regulation of the European Parliament and of the Council on OTC Derivatives, Central Counterparties and Trade Repositories were published on 27 July 2012 in the Official Journal of the European Union. EMIR will introduce significant changes to the over-the counter (OTC) derivatives market by mandating central clearing for standardized contracts and imposing risk mitigation standards for non-centrally cleared contracts. There will also be wide reporting requirements. The clearing obligation will apply to both financial counterparties and non-financial counterparties who exceed certain thresholds, and will apply broadly to OTC derivative contracts, including interest rate, credit, equity, and foreign exchange and commodity derivatives. EMIR enters into force on 16 August 2012. However, implementation will be gradual. The technical standards on various topics regarding the clearing obligation, CCP requirements and trade repositories are still being finalized, with the European Securities and Markets Authority (ESMA) and the other European Supervisory Authorities (ESA) due to propose final technical standards to the EU Commission by 30 September 2012. Thereafter the Commission must formally adopt technical standards through delegated acts. Existing EU CCPs will then have six months to apply for reauthorization, and once a CCP has been authorized under EMIR, ESMA will consider whether to apply a clearing obligation to the derivatives it clears. We expect the first central clearing obligations to be imposed in summer 2013. (Smith, 2012)

It is expected that primary legislation will be finally finished with the requirement to adopt by the end of 2012, and implementation of the 2013. Since the form of regulations, it will be binding and directly applicable in all Member States, without any further national implementation.

3.7 Differences and similarities of the new regulatory framework the European Union and United States

Access to US and EU regulators to design a new institutional structure of OTC financial derivatives market has a lot in common but different views. Adopted acts of the European Commission and the Dodd-Frank Act are quite common, similar and different points. With respect to regulatory responsibilities, derivative trading in the EU continues to be regulated by relevant national regulators, and CCPs in the EU will come under the supervision of them too. (Janda, Rausser, 2011) The EU ESMA will play a major role in the regulation of the task to control the CCP that not European. In the US Dood-Frank Act allows the distribution of responsibilities between the CFTC, which has jurisdiction over swaps and SEC, which has jurisdiction over security-based swaps. Implementation period is different. Most of the provisions Dood Frank Act and relevant rules went into effect as of July 2011, while the EU Regulation should enter into force by the end of 2012.

Dood-Frank Act and EMIR essentially have the same perimeter. No matter that the EU Regulation applies to a wide class of OTC derivatives, there are still some limitations. First, the EU definition does not include spot foreign exchange transactions, and accordingly, the Commission felt that it was important to exclude commercial forward foreign currency transactions. Second, the definition also excludes some types of liquid physical commodity transactions. Dood Frank law applies to a wide class of OTC derivatives, including any agreement, contract or transaction that may in the future be traded like swap. In the US, foreign exchange swaps and forwards may be exempted by regulation. Also the US but does not include some sort of liquid physical commodity transactions.

In the other key definitions of financial contracting partners including the EU, banks, investment companies, insurance companies, registered funds (UCITS), pension funds and alternative investment funds managers. In the US financial contracting partners are swap dealers, major swap participants, commodity pools, private funds, employee benefit plans and other entities mainly from the activities of the banking and financial sector, although the regulator may exempt small banks, savings associations, and the like. Within this framework, defines the major swap participants and entities that have a significant position in any class of OTC derivatives, entities that have an exceptional position and may be exposed to risks that could threaten financial stability and high leverage, entities that have an important place in any the class of OTC derivatives immense.

When it comes to banking trade OTC derivatives, the EU the EU approach does not introduce any equivalent to the Dodd-Frank “push out” rule which restricts the derivatives trading activities of banks. Similarly there is no EU equivalent to the “Volcker-rule” which restricts the proprietary trading operations of bank groups. As opposed to the US, there is also no provision which would allow regulators to restrict bank ownership of CCPs in the EU. (Janda *et al.* 2011) "Push out" rule allows getting some help from the government and access to cheaper funds from the Federal Reserve banks for greater trading volume, while Volker rule prohibits proprietary trading of many derivative instruments regulated by some financial institutions or branches.

MiFID is within its jurisdiction, requires the dealer to the EU must have the power in their dealings with OTC derivatives. There are exceptions when it comes to mandatory powers, which are mainly related to certain categories of distributors, although such exemptions do not exist in the US At the same time authorized dealers imposes rules of business conduct. In the US, Dood-Frank Act requires the involvement of dealers in OTC derivatives and requires registration of certain major swap participants and enforces rules of business conduct.

European Regulation requires from ESMA to decide which products will be subject to mandatory clearing, although the criteria differ from the criteria the US Dood-Frank law requires regulators to decide which OTC derivatives are subject to clearing, based on defined criteria that are different from the criteria of the EU, for example, to take into account the competition, clearing costs etc... In addition, US regulators can act as restricting trade agreement and before cleaning contracts through CCPs.

The EU clearing obligations relating to the financial business partners with eligible derivative contracts are entering into a business relationship with the other financial business partners. In the US the clearing obligation applies to anyone who comes to trade derivatives.

Non-financial contractual partner, the EU may be subject to mandatory clearing if their positions clearing exceed the threshold. In the US non-financial business partner can withdraw from the clearing obligation, provided, however, that the use of derivatives for hedging or mitigating risk, however, is required to notify the regulator on how it will fulfill its obligation to the untreated swaps.

The EU's financial business partners must report details of OTC derivatives contracts, even if the object of clearing, registered in the trade repository. Non-financial business partners are required to report their OTC contracts only if its position exceeds a certain threshold. In the US, each swap must be reported to a registered trade repository.

The proposed EU Regulation requires financial counterparties (and nonfinancial counterparties that exceed the clearing threshold) that enter into uncleared derivatives transactions to have arrangements in place to measure, monitor and mitigate operational and credit risk, including requirements for electronic confirmation, portfolio valuation and reconciliation, daily mark-to-market, as well as an appropriately segregated exchange of collateral or an appropriate and proportionate holding of capital (to be set by regulatory standards (Chance, 2011) Dood-Frank Act imposes mandatory requirements of capital and margin requirements for all swap dealers and major swap participants, but the margin requirements should not apply to the end users. The provisions of the law give the right contractors to require swap dealers or major swap participants to segregate initial margin on swaps untreated.

EU Regulation contains extensive provisions governing the organization and conduct of the business of CCP, including liquidity requirements which cover 99% margin exposure. The terms of portability include customer positions and collateral in case of default by the clearing. Dood-Frank law gives regulators a major role to develop organizational and business standards for CCPs. It contains provisions to require collateral for cleared swaps.

A very important institutional difference between the two regulatory approaches is that the Dodd-Frank Act requires that transactions that are subject to the clearing requirement are also subject to the mandatory exchange trading requirement. (Janda *et al.* 2011) Access to the execution of the contract but not necessarily on the stock exchange or through a registered SEF, a new "category of regulated multilateral trading facility", (Janda *et al* 2011). Further, it means that the trade will not occur if the transaction is exempt from clearing, exchange or SEF and do not swap available to trade. In the EU there is no suggestion of mandatory requirements to trade on the stock market, but such provisions may be considered within the directive of MiFID.

Between these two regulatory looked there a significant difference when it comes to access and "clearing organization ownership rules."(Janda *et al.* 2011) Dood-Frank law includes the CFTC and SEC proposals in the legal framework, with the idea, the limitations of votes of shareholders in a clearing agency that includes two limitations, first, that no member of no more 20% of the voting power and other, specialized financial entities that do not hold more than 40% of the voting power. The alternative is that the voting capital does not exceed 5%. In the EU approach, holders of significant shareholdings, direct or indirect, must be notified to the regulator, which may refuse authorization of the CCP if it does not consider such shareholders to be suitable (taking into account the need to ensure the sound and prudent management of the CCP). (Janda *et al.* 2011) EMIR does not contain specific rules on the ownership of voting capital.

3.8 Implications of new regulatory measures

The high degree of regulation of OTC financial derivatives markets on a global and national level, it will, in the future, affect all market participants, especially the big ones. Dodd-Frank Act and EMIR Regulation intertwined with Basel III regulations and other regulatory authorities will be extremely difficult to influence the company to quickly and effectively grasp and understand the new market realities.

Clearing of OTC derivatives, CCPs competition between investors and portfolio sharing between clearing and non-clearing will impact on the increase in funding costs for all participants in the OTC market.

Requests to cover the cost margins, will affect the profitability and reduce the effects of standardization and price transparency, especially when it comes to compensation payable to the clearing agencies abroad

At the same time, initial margins requirements and the needs of their everyday adjustments will affect the collateral securing higher costs for those contracts that have not been cleaned.

Exposure OTC financial derivatives markets netting at the portfolio can lead to loss of benefits, in the sense that it will be an eligible trade agreements made through a clearing agency unfit through bilateral agreements with collateral security or agreement. Multiple bilateral trades clearing and mulching will cause collateral requirements. Therefore, optimization of collateral will be a top priority, especially in terms of increasing the price of collateral and become a place of management efficiency. Established a new regulatory framework, in terms of funding costs, at least, will lead to their increase, which will make it difficult to trade OTC derivatives, and lead to a reduction in liquidity. The revocation of the contract, it can cause higher capital requirements or financial assets to cover margin requirements, which will undoubtedly decrease the liquidity. Consequences of that are, disorder (unfair) competition, because the participants in the market of financial derivatives, selectively choose their business partners, only regulatory and not by economic power.

There are fears that it will reduce the trade at the international level, as a result of increased and more stringent demands of national and international regulators, which will directly affect the possible choice of partner, reduce competition, inefficient allocation of resources collateral, liquidity and capital resources.

The establishment of a central clearing may result in increased complexity of operational and procedural tasks, which together with the rest of the major bilateral treaties require two marketing activities in one place for almost all participants. At the same time, it will affect the load and increase the pressure on companies that are subject to supervision by the various regulators.

Some proposals adopted laws, regulations and initiatives, or because of any accidental overlaps, conflicts and gaps can cause potentially new risks that may harm financial stability. In particular, it focuses on to centralize the clearing process can be a dangerous source of systemic risk, due to the high concentration of risk in one body.

Uncertainty operating companies and other firms, and all laws, rules and regulations, they finally enacted, creates uncertainty in the market, as well as discussions and complaints about how it will affect all of the regulatory requirements for risk, market liquidity and trading. Initially, the uncertainty will affect the integrated risk management, control and supervision of all financial fragmented and more heterogeneous market.

The new structure will lead to the creation of equal conditions for all operations, in terms of jurisdiction, arbitration, monitoring, compliance, joint monitoring activities, identify and mitigate systemic risk and improve efficiency. At the same time, it will gradually create an environment for innovation and the evolution of new financial products to existing OTC financial derivatives market, in a sense, providing new services and tools.

At the same time, the new structure of OTC financial derivatives market has faced some criticism, particularly in the US, which is why the proposed revision of certain provisions and certain provisions of the arbitration to the Constitutional Court, which is mainly related to the negative impact of the design on the development of financial markets, increasing the cost of participants, collateral requirements, capital requirements, increase operational activities and more. Although on the other hand the expectations are higher, especially in alleviating and limiting systemic risk and better risk management firm.

3.9 Instead of conclusion - international coordination and progress

For the successful implementation of the new institutional structure of OTC financial derivatives market needed a strong international coordination and cooperation between regulators. Critical minimum that cooperation and coordination involves the ability of all relevant organs and bodies to constantly develop shared goals, cooperative and multilateral relations and strengthen its mission and commitment to the adopted goals. This cooperation is related to the coordination of activities and actions to be taken to prevent any arbitrage between different jurisdictions with significant differences in regulatory applications. Therefore, regulatory frameworks and standards for CCP risk management should be consistent at the international level. Since of all participants required strict consistency in the implementation of new regulatory and supervisory framework of the OTC derivatives market. Strict consistency of participants includes the avoidance of possible overlaps in the various jurisdictions, legal inconsistencies and gaps and potential for conflict of legislative and regulatory rules and regulations. All this may delay or threaten the reform process and goals.

This consistency is based on a shared commitment to the defined responsibilities, actions and goals and constantly works on the identification and promotion of unique, compatible approaches in the search for better, more efficient and sustainable solutions. The challenges of global consistency, (practical objectives) in addition to avoiding arbitration should apply to avoid market distortions.

Then, the condition of equal opportunities for all can be uncertain and questionable, when it comes to multilateral coordination between participants originating from different jurisdictions and between those in which the regulatory framework established by law and applies to those that have yet to establish new rules. Improving and improving international coordination in the implementation of the new framework of trade on the OTC financial market demands, and continuing to work together on identifying gaps and their compliance. International harmonization is successfully achieved in the field of CCP, electronic trading and risk management. However, there are certain problems when it comes to coordinated and compatible application and operation of OTC financial derivatives markets at the international level. The problems of international coordination relating to the timing of the implementation of laws and regulations, cross-border competition, the implications of the laws and regulations of local regulators (US, EU) on the global coordination, existing or potential differences between geographically different jurisdictions and external-territoriality Dood- Frank Act, EMIR and other organs. Unsolved problems and gaps in the existing international coordination and lack of compliance, together with the impact of the new structure of OTC financial derivatives markets, opening up new horizons and vistas "financial reengineering" looking for new products, adapted to new conditions. In addition, there is a question, how participants in OTC financial derivatives market

required or forced to stick to US law, the EU and other countries, when operating outside of their reach? Despite all the challenges and problems that encouraging progress has been made in setting international standards, improvement of national legislation by some jurisdictions and the practical application of reforms and activities. Substantial progress has been made in the OTC derivatives markets of the developed US and EU which will be legislative and regulatory ready to implement new measures by the end of the time limit. Other jurisdictions are at a disadvantage, although they have made significant strides in legislation, especially regarding central clearing and reporting to trade repositories. The reason for the lag in some jurisdictions holds the key regulatory frameworks developed OTC market of the EU and US In addition, some jurisdictions have required a greater certainty in the application of international principles and the protection of cross-border financial market infrastructure in order to define an appropriate shape their own financial market infrastructure in accordance with the recommendations of the G20.

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Chapter 4

FINANCIAL MARKETS PRUDENTIAL REGULATION AS A DYNAMIC SELF-CORRECTIVE PROCESS

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FINANCIAL MARKETS PRUDENTIAL REGULATION AS A DYNAMIC SELF-CORRECTIVE PROCESS

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Abstract

The recent financial crisis has reminded us (again) that the so-called great moderation of macro-financial cycle was merely a mirage. It is therefore now more than ever appropriate to study the issues of economic and financial cycle and their interconnections. In this vein of research, risk-based prudential regulation of financial markets is of center importance. This chapter is therefore structured as follows. First, it highlights some specific features of prudential regulation in the financial markets. It looks at a different nature of the regulated risk in financial markets compared with other sectors of the economy and the consequences thereof for the robustness of the regulation. Related to that, effort of the regulated entities to optimize the impact of regulation on them is investigated. Finally, lessons learned are applied to shed some more light on the prospects of regulatory reform in order to achieve more viable and robust risk regulation of financial markets.

Keywords: financial markets, financial crisis, regulation.

4.1 Financial markets prudential regulation as a dynamic self-corrective process

The recent financial crisis has reminded us (again) that the so-called great moderation of macro-financial cycle was merely a mirage. It is therefore now more than ever appropriate to study the issues of economic and financial cycle and their interconnections. In this vein of research, risk-based prudential regulation of financial markets is of center importance.

A brief initial literature review shows that the drawbacks of prudential risk regulation have been reflected in the academic debate for quite a while. Doubts over prudential risk regulation include issues such as regulatory arbitrage or unintended consequences of risk weights inducing increased risk-taking (See e.g. Rochet, 1992). Baldwin and Black (2010) point out that too much attention is devoted to the *formal process* of risk regulation rather than to the risk itself. Consequently, identification of new forms and manifestations of risk seems to be less straightforward. Danielsson (2002, p. 1274) points out that if the regulatory risk management actually worked, the systemic failures should not actually ever happen. He therefore considers regulatory risk management to be merely a placebo rather than a scientifically proven effective tool of crisis prevention. The decision to use the relative riskiness of bank assets to calculate regulatory capital adequacy requirements was according to the professor Goodhart (2005, p. 122) a wrong one. Laurence Meyer, at that time one of the Fed governors, commented on the challenges faced by prudential regulation: “The growing size and complexity of banking organizations make the supervisor's job of protecting bank safety and soundness increasingly difficult. Size, scope, and complexity simply make it more difficult for

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supervisors to understand and evaluate bank positions and operations. In response, heightened supervisory focus on risk-management procedures and policies has been under way for some time. ... However, while new procedures, policies, and tools for risk management may ultimately buttress supervision and regulation, these tools are based on relatively recent financial theories that have yet to be tested under the full range of market conditions. Moreover, the sophistication and complexity of these new tools often make it more difficult, not less, for supervisors to assess the true risk of a banking organization and to assign appropriate capital requirements. Adding to these difficulties, supervisors must account for risk exposures that are altered at an ever faster pace." (Meyer, 1999)

Motivated by the financial and real economy losses caused by the crisis, numerous reform proposals to amend the prudential regulation were drafted by members of academia and policy makers and in some cases implemented. However, the main purpose of this chapter is not to consider *specific* proposals for regulatory reform. For a better understanding of the *principles* of prudential regulation it may be more appropriate to step back a little. Instead of an analysis of *specific* reform initiatives it may be more desirable and intellectually fruitful to try to explain the elements of *logic* of the prudential regulation. Subsequently, these findings and improved insight into these issues may indeed allow for an enhanced analysis of consequences of *specific* regulatory reform proposals. However, this does not imply that theory of regulation should be primarily based on empiricism. On the contrary, in this chapter we use logical deduction to build (at least partial elements of) that *logic*, and only following from that to comment on the current regulatory reform.

This chapter is therefore structured as follows. First, it highlights some specific features of prudential regulation in the financial markets. It looks at a different nature of the regulated risk in financial markets compared with other sectors of the economy and the consequences thereof for the robustness of the regulation. Related to that, effort of the regulated entities to optimize the impact of regulation on them is investigated. Finally, lessons learned are applied to shed some more light on the prospects of regulatory reform in order to achieve more viable and robust risk regulation of financial markets.

4.2 Specific features of financial markets prudential regulation

It could be argued that prudential regulation of financial markets is generally similar to the efforts of government to influence outcomes in other industries. Nevertheless, several factors can be identified which fundamentally distinguish prudential regulation of financial markets. Further on we therefore discuss (i) greater risk endogeneity in financial markets, (ii) regulatory models of risk regulation and risk endogeneity, (iii) time-lag before regulatory errors become apparent, (iv) overlapping and conflicting sources of the regulation and, (v) the fuzzy line separating public and private entities in financial markets.

A. Greater risk endogeneity in financial markets

Compared to risk regulation of other business sectors the nature of risk is different in financial markets. Technological risks are of a central importance in the process of safety and prudential regulation of e.g. a chemical industry or nuclear energy. However, in the case of prudential regulation

of financial markets, human action (e.g., a purposeful response to the incentives provided by the regulation) comes into the forefront.

It is quite likely that those in charge of e.g. a chemical production process will in some way adjust to the prudential rules governing their behavior. That is, they may take a course of action that is complaint with the rules, but may at some margin circumnavigate the initial purpose of the regulation, consequently making the drafting and implementing process of the regulatory rules more difficult. Risk regulated by prudential regulation in any industry is therefore essentially always endogenous. But, there is a *greater degree* of risk endogeneity in financial markets. Emphasis is deliberately given to the adjective. In regulation of the "technological processes" risks, there will always be some basic technical parameters the regulators may comfortably rely upon, because they are constant over time. For example, the temperature at which certain chemical compounds react in a specific way does not change *as a result of human response to the regulatory rules.* In contrast, in the case of prudential regulation of the financial markets, it is much more difficult to find similar stability of parameters, that regulation could make use of.

Obviously, some trends, patterns, relationships, causality can indeed by observed in financial markets too. However, these may often discontinue unexpectedly and for (ex-ante) unknown reasons. Furthermore, the statistical linkages are more likely to disappear if they are utilized in the regulatory process. The famous *Goodhart's law* claims that the regulated entities are likely to adjust their action in response to the incentives provided by the regulation and consequently weaken the initial causal link between the goals of the regulation and the intermediating control variable used to accomplish the regulatory objectives (see Goodhart and Mizen, 2003, pp. 241 - 246).

The optimization of the impact of regulation by the regulated entities upon themselves (even while the rules of the regulation are observed), i.e. *regulatory arbitrage*, may take different forms. The regulated entities may make use of regulation (1) in another jurisdiction, (2) for a different asset class or for another segment of financial markets. Acharya *et al.* (2011, p.44) focus predominantly on the second option, stating that regulatory arbitrage is the cause of the parallel financial (or shadow banking) system, which reflects the ability of financial sector to create such organizational forms of enterprise and engage in financial innovation in order to circumvent regulatory rules designed to limit risk-taking by banks. The regulatory arbitrage leads to a reduction of capital requirements without proportionate limits to undertaken risk exposures and at the same time increases complexity and reduces the transparency of these financial businesses for other market participants and the regulators (Jackson and Perraudin, 2000). The adjustment to capital adequacy rules and the optimization of capital requirements by using asset securitization is discussed in Jones (2000).

Prudential regulation of the financial sector does not match the referred analogy of ensuring safe operations of (even technologically complex) industrial production also because of the greater *complexity* of the financial markets (see Haldane, 2009). Moreover, the complexity seems to be rising, partly due to information technology and other factors reducing the costs of engaging in complex activities and structures, but also to some extent because of complex organizational structures being created on purpose in order to make policing of government guarantees more difficult and thereby to extract higher private rents (see Jones, 2000, p. 37).

B. Regulatory models of risk regulation and risk endogeneity

Danielsson (2002, p. 1274-1276) notices a number of reasons of the failure of models of regulatory risk management. These, according to him do not sufficiently reflect: (1) the limited ability of past observations of market developments to be still relevant in the future, (2) the feedback between action of market participants and the financial markets' outcomes, (3) a change in the statistical parameters of the analyzed time series during a crisis period, even if investors tend to behave differently during periods of an increased volatility, (4) the ability of the subjects of regulation to circumvent and reduce the effectiveness of the regulatory rules.

Risk management models can obviously be improved over time and become more sophisticated so that some of these objections can be mitigated. Despite that, the regulated entities will *always* have their own interest to respond to the regulation to limit its costly impact on them.

Risk in the financial markets is therefore not determined from the outside, but on the contrary it is an endogenous variable generated within the analyzed system. In order to be effective, risk regulation needs to be able to adjust to market responses to it relatively quickly and appropriately. Danielsson *(ibid.)* contrasts regulatory risk management in financial markets with weather prediction. Unlike regulatory risk management, the very fact that weather is forecast does not affect the outcome. In the case of *regulation* of risk, response of the subjects of the regulation to the risk regulation may influence financial markets outcomes and the risk exposures undertaken. In addition, the similar patterns of investment actions induced by regulatory risk management may cause liquidity problems and may lead to higher volatility in asset prices (see Danielsson, 2002, p. 1276; Danielsson *et al.*, 2004). If regulations limit the opportunities of banks to optimize their positions at individual level, they may incline to act more alike. Therefore, in particular during the crisis periods, this can produce more volatile price developments due to increased discrepancy in supply and demand of specific assets, and in turn limit liquidity and increase price volatility. Reliance on (in some sense) similar regulatory approaches to risk management across financial institutions or similarities of adjustment to the regulatory requirements has made the structure of the balance sheets of regulated institutions in some way more similar.

Commenting on the risk endogeneity in financial markets prudential regulation, Danielsson (2002, p. 1293) formulates an analogy of Goodhart's Law. Most existing risk models do not function according to him properly in times of crisis, as the stochastic process of the market prices discovery is endogenous to negotiations between market participants. If the prudential regulator attempts to manage this process, it changes its dynamics, and consequently risk prediction ceases to be reliable. To restate this, if you start to use models of regulatory risk management, their predictive power is likely to lose its original properties.

If the regulatory models took into account to a greater degree specific risks of a particular group of entities the issue of regulatory arbitrage could paradoxically become even more pronounced. For example Morrison (2011) supports increased capital requirements for banks that are (supposedly) too big to fail. At the same time, however, he is concerned that the *specific* requirements for a group of entities will provide an additional opportunity for regulatory arbitrage. Similarly, De la Torre *et al.* (2010) warn that tougher regulation of systemically important financial institutions would result in circumvention of regulation and would only make the issue of correct setting of specific boundaries of

the regulatory treatment of different categories of regulated entities more pervasive.

Prudential regulation would according to these authors have to be continuously adjusted as forces of regulatory arbitrage would make the financial firms outside the scope of the systemic regulation more systemic (De la Torre *et al.*, 2010, p. 27). In order to prevent circumvention of the regulation and to limit the need for constant modification of its settings, the authors recommend a uniform regulatory treatment of all segments of the financial market (De la Torre *et al.*, 2010, p. 43). The resilience and robustness of the proposal is however questionable, as the uniform approach may not fully reflect the specific risks undertaken by the individual entities.

C. Time lag before regulatory errors become apparent

It needs to be pointed out that given the complexity of financial markets and the implied difficulty to prudentially regulate them, relatively early materialization of inefficiencies caused by regulatory failures can be a key (be it costly) indirect *guideline* to improve the quality of the regulation. However, it may usually take a longer time in the financial markets before risks and imbalances resulting from the regulatory errors become apparent. For example, it may take many years before inefficient investments are manifested in a full asset bubble burst.

In contrast, an accident is likely to occur soon after safety rules are breached in a technological process and moreover the extent of this rules violation (before an accident takes place) can usually be observed by measurements of natural sciences.

At the same time it needs to be noted that the regulatory errors can operate in *conjunction*, so an accident (a financial crisis) is more difficult to be traced back to a *specific* (set of) failure(s) in the regulatory framework. Therefore, regulatory failure materialization is more important in the sense of public debate, i.e. it signals that something needs to be done, rather than what exactly should be done. The interlinkage can work in both directions, though. Not only that a materialization of losses may support a needed public policy action to take place, public policy may postpone risk materialization (so that for example politicians are reelected on good economy).

Obviously various negative developments and imbalances being accumulated can be with some accuracy observed and estimated by economists in advance, however (again) these observations cannot be confused with ease of direct measurement of, e.g. a rising temperature in a nuclear power-plant cooling system. In addition, the currently very popular early warning indicators may be a partial cause of the problem rather than an ideal cure. Due to the so-called paradox of financial stability, precisely in the period of the fastest accumulation of risk and rising imbalances, the financial sector and real economy usually appear to be most healthy. The seeming resilience is usually underpinned by cyclically and structurally unsustainable factors some of them are (by definition) recognized only after the bubble bursts.

With the corrective information signals of the prudential regulation failure being belated and indirect to rely upon, expectations of what prudential regulation can deliver need to be assessed with caution. An overambitious regulatory framework of financial stability may promote risk accumulation on the sidelines and thus incur costly losses on the society.

D. Overlapping and conflicting sources of the regulation

The conduct of prudential regulation, its practical organization and possible reform is also being complicated by the fact that it is usually conducted by a number of organizations and that their functions to some extent overlap. Failure of prudential regulation to maintain financial stability or prevent the transmission of destabilization of the financial sector into the real economy can result in an increased political willingness (and necessity) to intervene *further* with use of public support measures.

Prudential regulation in the narrow sense of the word has to deal with potentially destabilizing consequences of wide range of government policies in other areas such as housing, land-use planning, demography, social spending, fiscal policy, etc. As it has been mentioned, a much needed adjustment of prudential regulation can be also delayed by the incentives of a political cycle to postpone risk materialization.

A monetary authority may serve as an accommodating solution to an acute outburst of failure of prudential regulation in the sense that, due to its monopoly on the production of money it can under some conditions provide the ultimate liquidity backstop to avert a collapse of the financial sector. At the same time, however, the monetary policy, because of its impact on the time value of money can create bubbles in asset markets, increase pro-cyclicality and stimulate search for yield. Monetary policy can thus itself be a source of instability in the financial markets that weakens the effectiveness of prudential regulation. Moreover, the existence of monetary policy in terms of timely, organizationally and politically relatively easy to apply instrument to support the financial sector by public authorities, may increase expectations of a future bailout. Monetary policy can thus hamper the public authorities' ability to credibly commit themselves not to provide bailouts. This is both because of the fact that increased inefficiency of prudential regulation is more likely to *ex post* necessitate a bailout, and because of higher *ex ante* expectations of a bailout due to the relatively practical easiness to do so by an expansionary monetary policy.

E. Fuzzy line separating public and private entities in financial markets

Practical conduct and in particular reform of prudential regulation is also hampered by the unclear boundaries between public and private sectors. This objection can be raised in other regulated sectors of the economy as well, but its repercussions are more significant in the complex financial markets.

A de jure private firm can act as a public organization to some extent, if it gained a(n implicit) privilege to perform its activities as a result of a government intervention (e.g. rating agencies due to their specific role in prudential risk regulation in some jurisdictions). In theory, the private interests may thus be willing to oppose a change in the regulatory status quo because they may fear the uncertainties of their future role due to the reform.

Neither the costs to change a provider of a regulatory framework are always a reliable distinguishing feature between private and public arrangements. A public framework can also be opted out by transferring activities to other jurisdictions. On the contrary, a system of regulatory rules provided by competing private entities, such as a specific trading platform, can be prohibitively costly

to exit for the participants. Value of specific assets (such as a greater knowledge and reliability of trading counter-parties due to the past transactions) may create a lock-in like situation even if the rules' framework is operated by a competing provider. Collective action may thus be necessary under *both* private and public regulatory rules arrangements to articulate a credible threat of exit and/or re-bargain the regulatory rules.

Because of the interconnections between public and private entities and more specifically due to the fact that prudential regulation usually sets the implicit charge for provision of a (be it monopolistic) government "insurance scheme" of financial stability, efforts to "liberalize" prudential regulation need to be considered with an appropriate caution. It could hardly be justified that the cost of the insurance (i.e. the prudential requirements) was lowered (as a result of the "liberalization"), if at the same time the public authorities may fail to credibly commit themselves to limiting the scope and extent of the insurance pay-out.

4.3 The corrective process of prudential regulation

Continuous adjustment of regulatory rules is inevitable because of changes in market conditions autonomous to the regulation, the response of regulated entities to the regulation and also due to possible initial mistakes and errors made during the drafting of the prudential regulation. Baldwin and Black (2008) summarize the various tasks of prudential regulation that it is able to respond effectively to these developments. The regulation must, according to them, identify developments that are undesirable or distorting the effort to meet the regulatory objectives, respond to such behavior by implementing appropriate instruments, evaluate their success or failure, and if necessary modify the procedures of regulation again. Fine-tuning of regulation over time is supported by many other authors. Acharya *et al.* (2011, p. 44) criticize ignorance of regulatory arbitrage. Jones (2000) asks for a better alignment of regulatory risk measurement with the actual extent of the risk exposures undertaken by the banks. Given the changing market conditions, this is an implicit expression of support for discretionary adjustments of regulation. De la Torre *et al.* (2010, p. 42) criticize too slow response to changes in the structure of financial markets in the US, which led to a decline in the effectiveness of the Glass-Steagall Act. Insufficient regulatory adjustments to financial market developments that later led to the subprime mortgage crisis in the US are pointed out in Calem and Follain (2007). Prudential regulation of financial markets tends to be criticized for its static nature and inability to respond to market developments (e.g. Whitehead, 2011). Due to the speed of changes in financial markets, the timeliness of regulatory response is a key factor of quality of prudential risk regulation. However, all human action (including the processes that weaken the initial effectiveness of the regulation) does happen over time. Therefore ensuring that the prudential regulators have the incentives and information signals to respond *relatively timely* is of fundamental importance.

Regulation needs safeguards that prevent it from deviating on a path of social-wide inefficiencies and/or redistribution. However these safeguards are inevitably themselves weakened by the adverse effects they are supposed to protect the regulatory process from. Any safeguard is therefore also endogenous to the process of regulation. Therefore, it is necessary to examine the regulation as self-corrective process and look for robust long-term sources of discipline rather than static safeguards.

Regulators can in theory be *disciplined in multiple ways*. There can be competition inside a jurisdiction among regulators with overlapping powers. Or regulators in different jurisdictions can compete against each other. Some argue that a *decentralized* conduct of prudential regulation within smaller jurisdictions may improve discipline faced by the regulators due to an increased threat of competition. Moreover, the smaller-jurisdiction-specific regulations may reflect local conditions more appropriately. In addition, a higher number of jurisdictions also allows for a higher number of independent experiments in specific regulatory settings. Therefore the regulators are likely to receive more frequent and timely information signals about consequences of specific regulatory settings and these can be compared in a cross-border manner. Moreover, a suboptimal regulatory decision will only effect a smaller geographical area and the consequences will therefore be likely quantitatively less severe. In smaller jurisdictions there usually also prevails a closer fiscal and democratic link between the provider of a public good and the taxpayers, limiting the scope for rent-seeking.

However, the idea of small regulatory jurisdictions is simultaneously subject to *criticism*. The critics claim, that a small size of jurisdiction may not reflect the need to regulate a globally interconnected cross-border financial sector (see, e.g. Hardy and Nieto, 2011). Decentralized competition *without discipline, i.e. a clear and credible budget constraint* is also likely to end in the infamous *race to the bottom*. To prevent it, political mechanisms need to be examined. Functioning democratic process may prevent regulatory capture and ensure that regulators serve the taxpayers rather than any special interest groups. However, even that does not ensure the efficiency of the regulation and does not prevent losses borne by the society as a whole. Even if democratic decision making is not fully successful in preventing the dispersion of cots on to the public while concentrated rents are captured by special interests, there can be other ways of limiting that. Special interests can be held in check by themselves. In theory, they can compete against each other. Or, financial sector in its own interest may be willing to prevent major financial crisis resulting into socialization of losses, because it may fear the destabilization and long-term loss of profit opportunities. This may be in particular the case in “financial centers” that can be punished by a loss of trust by their global clients, who can easily chose between several options to allocate their assets. However, this self-interest of the financial industry in a global financial center may prevent a one-off crisis, but it is less likely to help avoid a slow, gradual process of cost dispersion facilitated by e.g. financial repression.

Sources of timely and appropriate information signals and discipline are in practice usually closely linked, but are obviously not the same. An undisciplined framework of prudential regulation that engages in redistribution may consequently get into a shape that makes collection of information signals and manageability of the system in an efficient way hardly possible. But even prudential regulators that face substantial discipline do not necessarily need to succeed in acting in an efficient manner, even if they are more likely to be incentivized to do so.

4.4 Ex-post critical overview of prudential regulation trends

Effort to improve the effectiveness of the regulation and to limit the (unintended) redistribution because of the regulation is (as it has been noted) were both (and still are) at the top of the reform to do list after the 2008 crisis. However, following from the findings made so far, several concerns related to the authorities' response to the crisis and developments since then can be identified. Here, we take

a look at just two of them. (I) the effort to accommodate financial markets by monetary policy response has facilitated search for yield and has made risk prudential regulation more difficult. (II) numerous new proposals were enacted contributing to greater regulatory complexity rising worries about its practical implementation. But is an explicit quest for *per se* simple regulation to be recommended?

A. Monetary policy accommodation and search for yield

The unprecedented monetary policy easing conducted by major central banks in response to the crisis has (so far) managed to prevent a major financial melt-down. However, it has had some unintended consequences too.

The cheap and available liquidity (at least to some counter-parties) has set-off yet another period of search for yield and contributed to accumulation of debt and risk in balance sheets of (at least) some financial market participants. Consequently, regulatory risk management has become even more difficult. Monetary policy has increased the volatility of health of financial institutions, as quality of assets held by the institutions has become ever more dependent on what the monetary authorities (are perceived and expected to) do. As a result, a credible commitment not to provide bail-out became even tougher to achieve.

Moreover, the monetary policy response has had a differentiated effect on *developed* and *emerging* economies. In the *developed*, more indebted economies, it has failed to kick start investment growth because of ongoing restructuring and deleveraging and a weak demand for credit. Furthermore, reform of prudential risk regulation and ongoing policy concerns about Eurozone have supported demand for assets, deemed to be safe by the financial market participants and also their regulators.

In contrast to *developed* economies the global monetary easing has kick-started growth in *emerging* markets. The liquidity and credit provided by central banks in developed markets entered new segments in a potentially overconfident manner. *Emerging* markets debt yields have declined as the asset class benefited from generally low levels of public and private debt and (at that time at least) positive growth outlook. But the case is far from being clear cut. Economic performance was boosted by growth of credit, investment and construction in countries such as Turkey, China or Poland. Soaring demand for commodities, advanced technologies and big scale industrial projects has supported exports not only from *emerging* markets but from some *developed* economies as well including Eurozone members. The global interconnections in real economy and financial markets have intensified again and also changed their structure. As a result, a wide range of countries could be left hurt in an unexpected way in case of a future slow-down of the global economy.

The key learning should be that to assess *domestic* financial market developments and quality of assets of *local* financial institutions the relevant authorities may need to consider a wide range of *global* issues and interconnected causes. Alternative investment structures in China, high share of consumer credit in Brazil, commodities super-cycle, global capital movements as a driver of sustainability of public debt in India - these are some of the issues macroprudential authorities may need to consider and grasp to be able to provide relevant advice. Macroprudential policy has never been more difficult. It may be very useful as an alarm bell, but anything more than that again runs risk of an overambitious regulation that is likely to fail.

B. Focus on the regulatory process rather than specific properties of its outcome

In the recent past it was widely believed that more detailed risk regulation will provide a significant improvement; many looked with optimism at a transition to a Basel II (see e.g. Illing and Paulin, 2005, p. 166; Lastra, 2004, p. 230). This is not to say that Basel I, II or III is necessarily more or less appropriate. The key mistake (of academia in particular) is the enthusiasm to discover a *short cut to the desired outcome* of regulation rather than to study regulation as a dynamic process of evolutionary testing of ability of specific regulatory settings to *produce* the desired outcomes.

Haldane (2012) provides a remarkable case in favor of simple rather than complex prudential regulation of financial markets. He points out the increasing complexity from Basel I to Basel II and III. Consequently, he argues that complex regulation may be difficult to operate practically and may yield suboptimal outcomes compared to simpler regulatory solutions. Haldane makes a rare, but a much need case. However, his argument suffers from a number of weaknesses.

As the title of Haldane's article suggests an analogy of a dog catching a frisbee is used to illustrate that an overcomplicated approach may help in catching neither a frisbee nor a financial crisis. However the analogy is far from perfect. A dog running to catch a frisbee does not influence the trajectory and other properties of its flight. In contrast, a regulator trying to catch and mitigate a financial crisis does. In case of a frisbee physical parameters and analytical tools of natural sciences can help to explain the path of the flight. In the financial markets, the path and the outcome depend on a complex feedback response to the regulation by the regulated entities.

Knowing what not to do may help. But the idea to avoid overcomplexity hardly provides a solution on what should be done. Moving away from regulatory complexity is not simple:

- The difficulties in implementing and enforcing complex prudential rules do not necessarily imply that simple rules would produce more desirable outcomes. On the contrary, they may fall prey to similar regulatory arbitrage processes as complex regulations. The simpler rules may benefit from easier policing and enforcement, but on the other hand they may not in the same manner cover all the specific risks undertaken by financial markets participants.
- It is possible that predictive power of simple measures in forecasting a bank failure may be a bit overestimated. A simple measure may benefit in terms of its predictive power from the fact that it was not used in practice recently, and therefore the regulated entities did not strategically adjust to it their actions (e.g. asset allocations and portfolio structure). Therefore the Goodhart's law did not apply, but it would have, if the measure had been used.
- Your enemy's enemy does not have to be your friend. Showing that complex regulation is not likely to work does not provide a clear cut argument for simple regulation. Haldane fails to provide answers on what should be done, and how should the desired outcomes be achieved. How much more simple regulation should be implemented, and specifically in what areas? How would the simple regulation cover the risks in complex financial markets? Haldane admits that simple rules run the risk of "backdoor complexity". So what would prevent the simple regulation from being weakened by regulatory arbitrage or from deviating onto the path of gradually increasing complexity?

Regulation is a dynamic path dependent process. Understanding the "appropriate properties" of the outcome of regulatory design may not be enough. It may fail to provide *the* solution that *fits* the

local time- and jurisdiction- specific circumstances and culture. A few *isolated* "appropriate properties" of regulation are not necessarily the same as the right process necessary to reach them and sustain them. A functioning regulation that prevents inefficiencies and rent-seeking is indeed likely to be in some sense simple. But simple regulation does not guarantee achieving these goals.

Moreover, simplicity or complexity of regulation is an outcome rather than a goal. It is a result of the process of evolution of prudential regulation. Regulators need to be disciplined by those who pay for it so that they have incentives to try to act on the discovered regulatory inefficiencies.
Regulatory complexity may obviously turn out undesirable, but not as such, rather as a *result* of a failure of regulatory complexity to deliver. For example, complex regulatory systems may provide feedback signals on regulatory errors too late. Again however, the quest for simplicity is rather an *indirect outcome* of the search for efficient regulation.

4.5 Concluding remarks

Optimistic expectations of what can prudential regulation of financial markets achieve form the risk of creating a too ambitious and thus vulnerable system. As it has been noted, in contrast to natural sciences, risk cannot be measured reliably in financial markets. Parameters of prudential regulation are more volatile due to purposeful human action incentivized by the regulation itself. Signals of regulatory failure are due to the Sisyphean complexity of the task undertaken often only indirect, blurred and belated. Multiple policy actions and private and public organizations impact the outcome of prudential regulation of financial markets and their implications may be difficult to trace, separate and reform. Moreover, because of the complex interconnections between financial markets and real economy, effort to stabilize the cycle of financial markets requires that the competent authorities can understand the real economy cycle and distinguish it from the structural changes in the real economy. This can be very difficult not only due to potential economic policy pressures but primarily because of cognitive issues.

Following from the previous points, it is obvious that financial markets and the system of their prudential regulation can move for a relatively long time along a path of an unsustainable risk accumulation resulting into huge losses when the imbalances and bubbles burst. Therefore an early and reasonably appropriate corrective process of prudential regulation is key, so that not only redistribution (socialization of losses) but also (and perhaps more importantly) wider societal-inefficiencies are prevented soon enough from further accumulation and escalation. That is why, guiding information *signals* and *discipline* (is discussed in this chapter) need to be provided to the regulators so that they are both able and willing to adjust the regulatory framework efficiently.

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Chapter 5

GLOBAL AND REGIONAL REGULATORY CHANGES TO THE FINANCIAL INDUSTRY AS A CONSEQUENCE OF THE FINANCIAL CRISIS: THE CASE OF THE EUROPEAN UNION

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GLOBAL AND REGIONAL REGULATORY CHANGES TO THE FINANCIAL INDUSTRY AS A CONSEQUENCE OF THE FINANCIAL CRISIS: THE CASE OF THE EUROPEAN UNION

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Abstract

Since the first signs of the financial crisis appeared during 2007, several national governments announced initiatives to implement extensive bailout measures and recovery plans backed up with tax-payers money. The official language was very similar in all countries; extraordinary measures were required to avoid a systemic collapse that could endanger economic stability. However, it was during the Global Finance summit that took place in London in November of 2008 that the most industrialized and the biggest emerging economies agreed on the implementation of a global financial reform to close loopholes in regulation and supervision. While the discussion about the origins and consequences of the recent Financial Crisis will be an ongoing topic for many years to come, a number of national governments, regulatory agencies and international financial organizations, have already taken important steps and towards the implementation of new regulatory frameworks, as well as more robust supervision mechanisms of the financial industry.

This chapter briefly discusses the antecedents of Financial Regulation in the European Union, as well as the political and institutional responses of governments to the Financial Crisis of 2007-2009. As a result of our critical analysis, we conclude there is no doubt of the interest of national authorities to minimize the probability of a repetition of a systemic financial stress episode or, worse yet, another fully fledged financial crisis; but the challenge to conciliate so many legislations, political interests and economic interests is not a trivial matter.

Keywords: financial crisis, financial industry, regulation.

> *"The central tasks of the theory of economic regulation are to explain who will receive the benefits or burdens of regulation, what form regulation will take, and the effects of regulation upon the allocation of resources."*
>
> George J. Stigler, The Theory of Economic Regulation, 1971.

5.1 Introduction

At a national level, the regulatory bodies of the financial industry consist of government-sponsored supervisors plus a collection of legally binding rules and principles of behavior. The violation of those regulations may result in penalties that go from simple pecuniary fines for minor violations, to the loss of franchises in the case of institutions, or penitentiary reclusion in the case of individuals guilty of major offenses. The loss of a franchise may happen in a variety of forms, which sometimes disguise the true nature of the measure. For example, one possible case is when

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government authorities do not respond to bail-out calls from institutions that have gone too far astray and have fallen into financial distress, or even the tacit or explicit expropriation of troubled entities in extreme cases.

Since the Great Depression of the decade of the 1930s, a period in which many financial intermediaries' franchises were lost, such extreme episodes occurred only sporadically, although they were more likely to happen during severe recessions or periods of systemic stress[23]. However, during the recent 2007-2009 financial crisis, they became extremely frequent again. Several implicit "temporary" franchise expropriations, including different governments´ take-over of institutions (e.g. the cases of the Royal Bank of Scotland in Great Britain[24], the Bank of America and Citibank[25] in the US, Fortis Bank in Belgium, and Hypo Real Estate in Germany), made clear that the polemic doctrine of "too-big-to-fail" was, after all, acceptable under extraordinary circumstances, and that the stability of the banking system had the highest priority.

But bailouts have a limit, as evidenced during the extremely turbulent late summer weeks of 2008 when an icon of Wall Street, the 150 years old venerable Lehman Brothers, was subject to a definitive franchise "expropriation". Lehman was forced into bankruptcy[26] and subsequent liquidation when its anguished bailout claims were not answered by the US government (Treasury Department) due to legal impediments, and industry efforts coordinated by the Fed and the Treasury Department could not find a private sector buyer for the ailing institution.

As a corollary of the enormous economic costs and the dramatic loss of confidence that resulted from the global financial crisis, the idea that an increasingly globalized financial industry desperately needs a revamping of its regulatory framework became very frequently discussed. Typically, short after episodes of financial crises, governments have responded with an encompassing regulatory reform some time later called "exaggerated" by both private and public participants. That was the case in the United States after the market crash that detonated the 1930s "Great Depression"[27], with the Glass-Steagall legislation; many years later, the scandals of the Savings and Loans institutions during the late 1980s brought about more restrictive regulations on that sector; or the Enron, Xerox, Tyco and others' fraudulent scandals at the beginning of the 21st century that were at the origin of the Oxley-Sarbanes legislation.

Recently, the "Subprime-Mortgages Financial Crisis" of 2007-2009 once again provoked an encompassing financial sector regulatory revamp in major industrialized countries, home of the largest

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[23] The "Savings and Loans" crisis, which brought along the bankruptcy of a large number of S&L banking institutions and required extensive government involvement to bail-out and build a new institutional framework to deal with that crisis.

[24] In October 13, 2008, Royal Bank of Scotland announced that the British Government would take a stake of up to 58% in the Group. The aim was to "make available new tier 1 capital to UK banks and building societies to strengthen their resources permitting them to restructure their finances, while maintaining their support for the real economy, through the recapitalisation scheme which has been made available to eligible institutions. HM Treasury *(2008-10-13). Treasury statement on financial support to the banking industry, p*ress release.

[25] In October 2008 the US government was set to buy preferred equity stakes in Goldman Sachs Group Inc., Morgan Stanley, J.P. Morgan Chase & Co., Bank of America Corp. -- including the soon-to-be acquired Merrill Lynch -- Citigroup Inc., Wells Fargo & Co., Bank of New York Mellon and State Street Corp., and probably thousands of other banks. However, Bank of America, J.P. Morgan, Wells Fargo and Citibank were the largest recipients with 25 billion dollars each. During the first months of 2009, Citibank required additional resources. US to buy Stakes in Nation's Largest Banks, Wall Street Journal, October 14, 2008. http://online.wsj.com/article/SB122390023840728367.html

[26] Lehman filed for Chapter 11 bankruptcy protection on September 15, 2008.

[27] The "Glass-Steagall Act", named after its two authors, separated the investment banking activity from the commercial banking in American banks during a little more than half a century.

multinational banks, which were the intermediaries most affected by the crisis, provoking ripple effects across many other countries, and raising the odds that for the first time the financial industry's regulatory framework will finally achieve a supra-national status[28].

It is unlikely that the new regulation or any other institutional measures will be capable of fully eliminating the risks of new asset bubbles or financial crises occurring in the future, but there are good reasons to believe that well-coordinated regulatory and supervisory measures can significantly reduce the probability of their occurrence as well as to reduce the magnitude of their cost, whenever they happen.

Economic history shows that financial institutions do not actively internalize the costs of risky operational decisions, and that represents one of the major reasons why a good financial regulation is deemed absolutely necessary. A "systemic risk" exists due to the financial system's many extensive and complex links with all other sectors in the economy such that the collapse of one or several large financial institutions can detonate a chain reaction and may impact many others, as well as have more encompassing effects on the domestic and the international financial markets. This sequence of events is also likely to transmit dangerous contagion effects to the rest of the economy.

From the point of view of the individual citizen, regulatory protection is necessary because there is asymmetry of information between the suppliers of financial products and savers. Regulation is necessary to guarantee the flow of information on the financial health of the provider of financial products and services, in particular when "the pay-off to the customer is contingent on the continued health of the seller (e.g., in the market for deposits and insurance)" (Nier, 2009).

5.2 The European Union's financial regulation framework: some antecedents

The creation of the European Common Market[29] in 1957 represented an institutional platform for the growing commercial integration of Western European countries. Almost four decades later, very significant volumes of cross-border trade and investment justified a still more intense integration of the different national financial markets. The constantly increasing volume of daily financial transactions justified a centralized supervision and the support of information flows across borders, ideally coordinated by national supervisory agencies. The institutional framework needed to organize the harmonic coexistence of all member states' economic activities originated new institutions and regulations that, nowadays, define many different aspects of their social, political and economic relations.

According to the legislative process principles in force within the EU the greater part of the legislation that applies in the field of financial services is adopted at the European Commission level, with the purpose to ensure that the same rules or, in some case, minimum standards prevail throughout all member countries; however, some regulation and supervision areas still remain under the control of the member states[30]. The European Commission can propose new legislative

[28] One of the most recent encompassing initiatives to minimize not the probability but the cost of possible future banking crises has been the imposition of a special tax on larger banks, that for their large assets fall in the category of "too big to fail" in order to create a reserve that may be used to bail them out, instead of resorting to the taxpayers' pockets. ("Bank Tax gains momentum", Wall Street Journal, March 29, 2010)

[29] The European Common Market was formedby France, West Germany, Luxembourg, Italy, Belgium and Holland.

[30] Mainly those referred to the sanctions imposed in cases of breach of rules in force.

measures, but only after the adoption of the Commission's proposals by the member governments and the European Parliament, do they become legally binding legislation.

There are two kinds of legislative acts in the EU, directives and regulations. The former are more common and, once adopted by the member states, they must be implemented at the national level, usually within two years; however, they leave member states a margin of maneuver to adapt the contents of the directive to the specificities of their national environment. In the case of regulations, once adopted, they apply directly in the legal order of the member states, i.e., there is no margin of maneuver to adapt them[31].

5.2.1 The first bank directive

The first antecedent of a common financial regulation for all EU member countries[32] was the "First Bank Directive", issued on December 12, 1977, that established the principle that all banks established in a member state had the freedom to start operations in other member states, conditioned only by the scrupulous observance of the host country's legislation and the national authorities' guidelines. Due to the fact that a number of obligatory rules substantially differed from one country to another, notably in relation to minimum capital requirements, the First Directive had a limited impact in terms of promoting the integration of a Single European Financial Market.

Many of the problems contained in the First Directive guidelines were addressed and completely reformulated in the "White Book" of 1985. Among the most remarkable innovations, was the introduction of the explicit intention to constitute a Single Financial Market in Europe. Such an ambitious objective required the gradual elimination of differences across different domestic markets, a complex challenge due to the inexistence of a unified conception of the regulatory frame that would be desired to establish in all member countries, as well as the obvious inherent political implications.

The White Book would proof decisive towards the future financial integration of the region. Its follow-up was the adoption of the "Single Act" of December 1989, where the principle that all national legislations were inspired by the same set of concerns (consumers' protection, savers safety, etc.) justified the belief that with a minimal harmonization of rules and principles each member country could trust in its communitarian partners and recognize the measures adopted by them as equivalent to their own. This initiative avoided the need to attempt a replacement of the different national regulations as a pre-condition to advance towards a unified financial market.

5.2.2 The second bank directive

In January of 1993, a Second Banking Directive modified and complemented the First Directive in what regards the notion of freedom of establishments and the principle of mutual recognition, by replacing them with the concept of "Single Communitarian License".

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[31] http://ec.europa.eu/internal_market/top_layer/quick_en.htm

[32] "European Community" is a term that referred to the European Economic Community (EEC), the European Coal and Steel Community (ECSC), and the European Atomic Energy Community (Euratom). The EC is now a separate legal entity within the European Union (EU), which was established under the Maastricht Treaty (1992) and includes intergovernmental cooperation on security and judicial affairs.

The Second Banking Directive included interest rate controls, the regulation of cross-border movements of capital and restrictions on borrowing and reserve requirements that varied from one country to another[33]. Among its main achievements was the definition of the exact meaning of "banking", as there were significant differences in the activities performed by banking institutions in different countries of the EU, and in line with the so called "Continental" model, mainly present in Germany, and which stood in stark contrast to the "Anglo-Saxon"[34] model. With the Second Banking Directive, the EU adopted the "universal banking model"[35].

The Second Bank Directive also introduced the principle of "home-country control" or "mutual recognition", which means that each bank has to conform to the regulation and legislation of its home country[36]. It also introduced the "Banking Passport", enabling banks that were registered in any EU member country to expand their business to all other member countries. This principle of mutual recognition eliminated the bank's need to obtain a local banking charter for branches or bank products permitted by the regulations of the bank's home country, and made cross-border banking and branching easier[37].

The intention of the new legal framework was to formalize the freedom of capital movements, to establish some general rules for the provision of services in the banking sector, and the preservation of stability of the financial system. Furthermore, it also aimed to prevent that financial resources moved through the pipelines of the EU banking institutions could be used to finance terrorist activities, and should serve as a significant component of the institutional infrastructure that would support the creation of a single European payments area[38].

The development of the legal framework was guided by three main principles. First, each nation should retain its own banking supervisory and regulatory institutions. Second, a minimal harmonization from a level above the national level should be achieved, i.e., individual countries would maintain their own regulatory and supervisory regimes, but all member nations within the EU should provide minimum standards. Third, directives would have to be issued at EU level, which meant that individual nations would have to take legislative action to incorporate the directives' intentions, but the exact content of the legislation was not be dictated to them[39].

5.2.3 The Investment services directive

In 1996, the full enforcement of the Investment Services Directive (ISD) represented the completion of the first stage of regulatory changes for the three major financial services (banking, insurance and investment services). "The ISD created a European Passport for non-bank investment firms to carry out in all Member States a wide range of investment business (i.e. order collecting,

[33] EU Financial Services Market: From the idea of common market to financial services action plan: http://www.eestipank.info/pub/en/dokumendid/publikatsioonid/seeriad/kroon_majandus/_2003_2/_50-58aarma.pdf?objId=314192

[34] The Anglo-Saxon model of financial services separated banking and securities activities, while Germany had a tradition of universal banking, making no distinction between banks and security firms.

[35] European Financial Regulation: http://www.riskglossary.com/articles/european_financial_regulation.htm

[36] European Union Financial Developments: The Single Market, the Single Currency and Banking: http://www.fdic.gov/bank/analytical/banking/2000may/2_13n1.pdf

[37] Integrating Banking Markets in the EC: http://www.frbsf.org/econrsrch/wklyltr/el9612.html

[38] The legal framework for a single European Banking Market: http://www.hba.gr/4news/FYROM.pdf

[39] European Union Financial Developments: The Single Market, the Single Currency and Banking: http://www.fdic.gov/bank/analytical/banking/2000may/2_13n1.pdf

execution of orders on an agency basis, dealing, portfolio management and underwriting), as well as certain additional services (such as investment advice, advice on mergers and acquisitions, safekeeping and administration of securities and foreign exchange transactions) if mentioned specifically in the authorization" [40]. Since then, national financial authorities supervise the observance of the country-of-origin's regulations, and host countries' regulators establish and supervise the rules of conduct.

5.2.4 The capital adequacy directive

To minimize the probability that regulatory conflicts could hinder the stability of financial institutions subject to different national capital requirements, in 1993 the EC also decided to implement the Capital Adequacy Directive (CAD) to establish uniform capital requirements for universal banks and security firms.

The European Union countries developed the CAD at the same time that the Basel Committee was working on a model to establish adequate capitalization rules for banks that responded to market risk conditions, but the Basel Accord was complete until 1996. The CAD, however, did not provide internal Value at Risk (VAR) measures, putting European banks at a relative disadvantage with respect to banks outside Europe. It was amended in 1998 to allow for the use of VAR models (CAD 2), and with the update of the Basel Standards, a new Capital Adequacy Directive (CAD 3), which implemented Basel II principles, was developed. That directive had a much wider scope of application. The new Basel Accord renewed and significantly improved the then existing rules: it provided incentives for good risk management practices, increased risk sensitivity of calibration models and reduced opportunities for regulatory arbitrage[41].

5.2.5 Financial services action plan

The Financial Services Action Plan (FSAP) was presented by the European Commission in May 1999, with the aim to achieve full integration of the EU banking and capital markets by 2005. The plan was less radical compared to others proposed in the early 1990s, but rather improved on achievements and adjusted the legal framework to fast changing market developments.

Its conception was developed with three strategic goals in mind:

- Completing a single wholesale market for financial services;
- Developing open and secure retail banking and retail insurance markets;
- Ensuring state-of-the art prudential rules and supervision.[42]

The FSAP covered a vast area of financial services activity and comprised 41 separate measures designed to complete the legislative framework for the internal market in what regards financial services, related to wholesale as well as to retail markets. The measures that were introduced by this instrument were categorized under a series of general priorities for action.

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[40] On the 1st of January, 1996. Source: European Commission, Single Market News, No. 2, February, 1996. Obtained from: http://ec.europa.eu/internal_market/smn/smn02/s2mn13.htm#fn8 on February 16, 2010.

[41] The transposition of the new Basel accord into legislation: http://www.hm-treasury.gov.uk/media/9D1/61/cad3condoc03.pdf

[42] EU Financial Services Market: From the idea of common market to financial services action plan: http://www.eestipank.info/pub/en/dokumendid/publikatsioonid/seeriad/kroon_majandus/_2003_2/_50-58aarma.pdf?objId=314192

Moreover, the FSAP contained measures that were either relevant to the prudential supervision of an integrated financial system, or were designed to improve the general conditions for financial efficiency, notably in the areas of corporate governance and taxation[43].

5.2.6 The Commission of Wise Men and the Lamfalussy report

In July of 2000, Baron Alexander Lamfalussy, former President of the European Monetary Institute in Frankfurt[44], and co-founder of the European Central Bank (ECB), was appointed by the council of Finance Ministers of the EU to chair a Commission that would be in charge to propose regulatory measures aimed at developing the EU financial services industry (securities, banks and insurance)[45]. The proposals were meant to achieve a more consistent interpretation of the EU legislation, greater convergence among national supervisory practices and improve the technical quality of the financial services legislation. The report of the Commission was delivered on February 2001, and the discussion, as well as the gradual adoption of the Committee's recommendations, known as the "Lamfalussy Process", had the stated purpose to reinforce the European financial regulatory and supervisory framework by working at four levels:

Level 1: Consisting of legislative acts, namely Directives or Regulations, proposed by the Commission following consultation with all interested parties, and adopted under the "co-decision" procedure by the Council and the European Parliament, in accordance with the EC Treaty.

Level 2: The European Securities Committee, the future regulatory committee, would assist the Commission in adopting the relevant implementing measures, and ensure that technical provisions can be kept up to date with market developments.

Level 3: Improving the common and uniform implementation of Level 1 and 2 acts in the member states, a process in which the Committee of European Securities Regulators would have a particular responsibility.

Level 4: The Commission would strengthen the enforcement of Community law.

That four-level approach was fully endorsed by the European Council at Stockholm in March 2001. At that time, it was agreed that in those cases where implementing measures in the field of securities markets were acknowledged to be particularly sensitive, the Commission would avoid going against predominant views within the Council. The Lamfalussy Commission also proposed a set of "best practices" that had the objective to reinforce the EU's supervisory framework, especially during market instability periods.

One of the most tangible institutional results of the Lamfalussy report's recommendations was the creation of two pan-European institutions, the European Securities Committee and the European Securities Regulators' Committee. The most generalized opinion about the Lamfalussy Process is that it was positive and contributed to the advancement of the financial markets of the region. However, although it's positive aspects are undeniable (flexible regulation, convergence, cooperation, etc.)

[43] Ibid

[44] The European Monetary Institute was the immediate predecesor of the European Central Bank, before the introduction of the euro in 1999.

[45] The Lamlaussy Commission became known as the "Committee of Wise Men on the Regulation of the European Securities Markets".

several improvements were deemed necessary. During the following years the European Commission and the European Parliament consistently worked in developing the organization and mechanisms to facilitate the operation of an increasingly complex interlinked group of national financial markets.

5.3 The Basle agreements and a tentative explanation of why the existing regulations failed in 2007-2009

During the last three decades of the 20th century there was a dramatic increase in the relative size of wholesale financial services firms, as well as a deepening of their links with other productive sectors of the economy. The more globalized the world economy became, the more complex the functioning of global banks, managing their own multinational treasury and helping corporate entities to manage risks that naturally arise from global operations and from the continuous fluctuation of exchange rates, interest rates and commodities prices.

The Bank for International Settlements (BIS) responded to the new environmental conditions by promoting a profound revision of international standards to consolidate practices and reduce systematic risk. That effort was conducted by a Committee, integrated by several nations that after the 1974 liquidation of the Cologne-based Bank Herstatt decided to form a cooperative council to harmonize banking standards and regulations within and between all member states[46].

The Basle Committee drafted its first version of quantitative and technical benchmarks, known as the Basel I Accord, aimed to help harmonize banking supervision, regulation and capital adequacy standards, in 1988. A later version of international prudential regulation, as set forth by the Basel II Accord (2004), was drawn up as an improvement over the original Basel Accord. The main points addressed were the need for risk-sensitive capital ratios, increasing risk mitigation practices by addressing both operational and credit risk separately, and lastly, seeking for more supervision and market discipline to reduce regulatory arbitrage. The main objective of Basel II was to standardize international regulations with the purpose that national regulators can base on them for the design of their own laws and regulations (how much capital banks need to put aside to guard against diverse risks that banks face like market risk, operational risk and credit risk, etc.).

Basel II was blamed by some as one of the major culprits of the 2007-2009 financial crisis. In our opinion, such an accusation is unfair since Basle II principles were introduced in the EU as late as January 1, 2008, already in the middle of the Subprime Mortgages catastrophe, and were to be incorporated in the US legislation as late as April 1st of 2010[47].

However, it is illustrative to briefly review what several authors have written about this issue. For example, Danielsson *et al.* (2001) suggested that Basle II derived regulations failed to address risk as an internal or endogenous factor. They argued that Value-at-Risk, Basle II's preferred measure of risk may destabilize the economy and induce a crisis fueled by itself. They also highlight the significant reliance of Basle II on credit agencies as measures used in credit risk assessment by banks for individual customer's credit worthiness, and the lack of operational risk modeling due to the lack of adequate technologies and comprehensive data bases. Cannata and Quagliariello (2009)

[46] The Basle Committe founding countries were France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland the United Kingdom, the United States and Luxembourg, also known as the G-10.

[47] Several voices suggest there are strong reasons to believe that Basle II does need an extensive revision.

suggest that among several other responsibilities attributed to Basle II in connection with the financial crisis, there are such aspects as the fact that the average level of capital required by the new discipline is inadequate; that the new Capital Accord, interacting with fair-value accounting, has caused remarkable losses in the portfolios of intermediaries; that capital requirements based on the Basel II regulations are cyclical and therefore tend to reinforce business cycle fluctuations; that in the Basel II framework, the assessment of credit risk is delegated to non-banking institutions, such as rating agencies, which are potentially subject to conflicts of interest; that the key assumption that banks' internal models for measuring risk exposures are superior than any other has proved wrong; and, finally, that the new framework provides incentives to intermediaries to deconsolidate from their balance-sheets some very risky exposures. However, they recognized that in most cases it is not appropriate to link the current financial crisis to Basel II, and that some of the main drivers of the crisis simply cannot be entirely ascribed to the new regulation. Finally, Fees and Hege (2005) argue that relying on external Credit Rating Agencies is not the best alternative to credit risk measuring, and does not lead to efficient risk management practices or optimal capital requirements. If banks control their own portfolios' risk, they can increase its size and make the whole industry safer, by observing high credit quality standards.

The advent of the crisis was for many but a confirmation of the belief that there yet existed serious limitations in Basle II, instead of reevaluating the argument of an unfortunately inadequate timing in its implementation, as we mentioned earlier, the Basle Committee on Banking Supervision took for granted that the inability to anticipate what was coming and the extremely severe damages that could not be prevented were due to the imperfections of Basle II. But, even when there is no doubt that there were a number of improvement areas, it is also true that Basle II was a slowly crafted agreement. In its development process its designers were careful enough as to take into account many aspects affecting different parties and, for that reason, it was subject to extensive public consultations. Notwithstanding the antecedents of such a careful and inclusive process, shortly after the Subprime Mortgages market-originated crisis hit simultaneously so many banks in the developed world, on December of 2010 and as a follow-up of the G20 endorsement during their November Seoul summit, the Basle Committee issued the new Basle III rules text, "which presents the details of global regulatory standards on bank capital adequacy and liquidity agreed by the Governors and Heads of Supervision". The rules of Basle III contained the details of the new crisis-driven Basel III Framework, which encompasses both microprudential and macroprudential components.

The new Basle III framework sets out higher and better-quality capital, better risk coverage, the introduction of a leverage ratio as a backstop to the risk-based requirement, measures to promote the build up of capital that can be drawn down in periods of stress, and the introduction of two global liquidity standards. It will mandate banks to shore up capital to meet tighter requirements, which can be attained by either raising additional capital or rationalizing their lending portfolios. Incumbent stockholders usually prefer to avoid the first alternative in order to prevent the dilution of ownership, but it is a possibility in extreme conditions; and changes in a bank's lending policies mean a profound transformation of the relationship with its corporate customers. No simple one-fits-all seems likely, but bankers must take this commitment seriously as so much is at stake.

From the banking industry perspective there is the feeling that, while the Basle III proposal immediately gained adepts, it is not clear that all affected parties find the new rules pleasing. While it

took many years to develop the Basle II rules, the new Basle III version was finished in a very short time and apparently didn't have enough time for a careful evaluation of the potential effects of the new requirements that will be applied to banks' Balance Sheets. There is no doubt that the Financial Crisis proved the need for a reform of the Solvency Ratio of Basle II, but a few threads remain loose like, for example, the possibility that given higher capitalization requirements banking institutions will find it more difficult to provide an urgently needed credit support for the recovery of the economy, or that in its June 2010 version there was not a firm commitment to adopt all the new rules by large and important countries, like the United States. It is true, however, that the Committee put in place a number of mechanisms that ensure that Basle III gets rigorously and consistently implemented worldwide, and that there is a plan for a gradual phasing-in, so that the banking sector can move towards more solid capital and liquidity conditions without losing the ability to perform the important role it must play in the economic recovery process. Besides, with respect to the leverage ratio, the Committee will evaluate if its design and calibration is appropriate over a full credit cycle and for different types of business models (Bank for International Settlements, 2010). Even while Basle II was not fully enforced at the time the Global Financial Crisis hit the markets, it seems unlikely its preventive mechanisms and rules could have kept under control the extension of the disaster. So, in the absence of an official statement in that sense, one can infer from the actions of governments and Central Banks that they found numerous areas of opportunity that deserved prompt and thorough attention. That is the most likely explanation of why Basle II was replaced with Basle III.

5.4 The integration of the European Union financial markets, national regulations and the convergence efforts

Since the first signs of the financial crisis were noticed during the early months of 2007 and all along the following quarters, several national governments announced initiatives to implement extensive bailout measures and recovery plans backed up with tax-payers money. The official language was very similar in all countries; extraordinary measures were required to avoid a systemic collapse that could endanger economic stability. But it was until November of 2008, during the Global Finance summit that took place in London, that the most industrialized countries and the biggest emerging economies agreed on the implementation of a global financial reform to close loopholes in regulation and supervision.

After the initial meeting, the G20 leaders endorsed a document called "Framework for Strong, Sustainable and Balanced Growth", in which they committed to a timetable to achieve specific objectives and initiated a new consultative mutual assessment to evaluate whether their policies would collectively deliver the desired objectives. The implementation of that effort was delegated to international organizations capable of developing in-depth studies to inform the Leaders on what the policy alternatives were, as well as their pros and cons. They designated the International Monetary Fund (IMF) and the World Bank (WB) to perform multiple analyses, supported with inputs from other international organizations, including the Financial Standards Board, the Organization for Economic Cooperation and Development, the International Labor Organization, the World Trade Organization and the United Nations Conference on Trade and Development. The stated objective was to provide technical and conceptual foundations required to:

- Set out national and regional policy frameworks, programs and projections by the end of January 2010;
- Conduct the initial phase of a cooperative mutual assessment process, supported by IMF and World Bank analyses, of the collective consistency of national and regional policies;
- Develop a basket of policy options to deliver those objectives, for Leaders to consider at their Summit in June 2010; and,
- Refine mutual assessments and develop more specific policy recommendations for Leaders at their Summit in November 2010.

While the discussion about the origins and consequences of the recent financial crisis will continue for many years to come, already at the present a number of national governments, regulatory agencies and international financial organizations, have taken the initiative and started the implementation of new regulatory frameworks as well as more robust supervision mechanisms of the financial industry. Probably the most relevant move in that direction was the agreement of the EU member countries to accept a single supervisor for all banks in the area, and that high responsibility was awarded to the European Central Bank. It is nothing short from admirable that during a period of turbulent financial markets rocked by the immediate possibility of a Greek sovereign debt default, by and Irish, Portuguese and Spanish bailouts and the downgrading of France, one of the two strong pillars for the European Financial Stability Facility (the other one was Germany), EU members could reach an agreement and accept the compromises required to delegate that very important responsibility to the ECB. Apparently, there is no doubt about the different national authorities' great interest to minimize the probability of a repetition of a systemic financial stress episode or, worse yet, another fully fledged financial crisis.

5.4.1 The Larosière and Turner Reports

In October 2008, the Chancellor of the UK Exchequer and the President of the European Commission, commanded the preparation of in depth analyses of the causes of the financial crisis and recommendations to minimize the likeliness of its recurrence to Lord Turner, head of the Financial Services Authority, and Jacques de Larosière, chairman of the de Larosière group (created for that purpose), respectively.

Jacques de Larosière released his report on February 25, 2009, and Lord Turner on March, 2009. Both reports make an extensive and in-depth analysis of the origins of the financial crisis and coincide in several points, but also have significant differences. Highly sophisticated analyses of the causes of the financial crisis, they reflect the point of view of notable specialists on the more relevant issues to consider towards the implementation of new regulations that better serve the needs of the global financial industry, but particularly that of the UK and the EU Both shared in many aspects of the diagnosis of the financial crisis, like the fact that it was macroeconomic imbalances which created the conditions for excessive lending practices that eventually provoked a credit bubble in the United States and other developed nations, or that massive growth in the scale and complexity of securitized credits surpassed the ability of financial intermediaries to control their risk exposure.

They also hold supervisory authorities and bank management executives responsible for relying on mathematical models and credit ratings to control their portfolios which, in an environment of extensive deviations from "normality", were likely to have resulted in lax decisions and recommend reviewing Basel II in order to improve several aspects. The main point is to avoid procyclicality measures in Basel II's implementation, in order to reduce the extent to which lending capacity is impaired in an economic downturn. However, what seems to be an original contribution of the reports and a shared concern is the conviction that the members of the EU urgently need to have a consistent set of national rules and regulations that eliminate existing inconsistencies.

The de Larosière group report emphatically argues that "an efficient single market should have a harmonized set of core rules. In order to have this set of core rules the EU needs to harmonize rules and regulations from country to country. The main problem is that each country has its own regulations and it's impossible to have an efficient market with these characteristics" (Larosière, 2009).

Among the most relevant proposals of the de Larosière report are:

- A specific and detailed review of Basel II to increase the minimum capital requirements and enforce a better set of rules for off-balance sheet items that reduce procyclicality. For better results in Basel II, according to the de Larosière report, there need to be more strict rules and laws for the internal control of the banks and to guarantee liquidity.
- The idea that credit rating agencies need a fundamental review of their models to achieve a better interpretation of what is the economic reality of securities issuers, and that with time there needs to be a reduction in the use of ratings.
- That there should be a standard accounting reporting methodology in order to achieve better transparency in the valuation of assets in illiquid markets, where mark-to-market mechanisms cannot be used.
- That all financial firms should be subject to a common regulation that explicitly establishes appropriate capital requirements.
- That the risk management function needs to be independent of financial institutions in order to have effectiveness. Risk monitoring within financial institutions evidently failed during the recent crisis.
- The need to develop an encompassing EU efficient regulatory framework.
- That the Deposit Guarantee Schemes (DGS) in the EU need to provide an equal and high level of protection to all bank customers, i.e., to set the same rules in all countries.

The de Larosière group also recommended that the European Central Bank (ECB) should play a major role in the new European supervisory system in two aspects: macro-prudential supervision and micro-prudential supervision. The following diagram, reproduced from the de Larosière report, introduces the European Systemic Risk Council and the European System of Financial Supervision as the instances responsible for both levels of supervision and continuous risk assessment.

The macro prudential supervision component aims to establish the European Systemic Risk Council (ESRC) to replace the current Banking Supervision Committee (BSC). Its task would be to form judgments and make recommendations on macro-prudential policy, issue risk warnings,

compare observations on macro-economic and prudential developments and give direction to these issues.

There is a need to assure a proper flow of information between national supervisors and the ECB/ESCB to allow the ESRC to perform its function; as well as an effective early warning mechanism to detect the first signs of weakness at the institutions level. With such early warning system, and depending on the nature of the risks detected, the relevant EU authorities would be alerted to take a proper action.

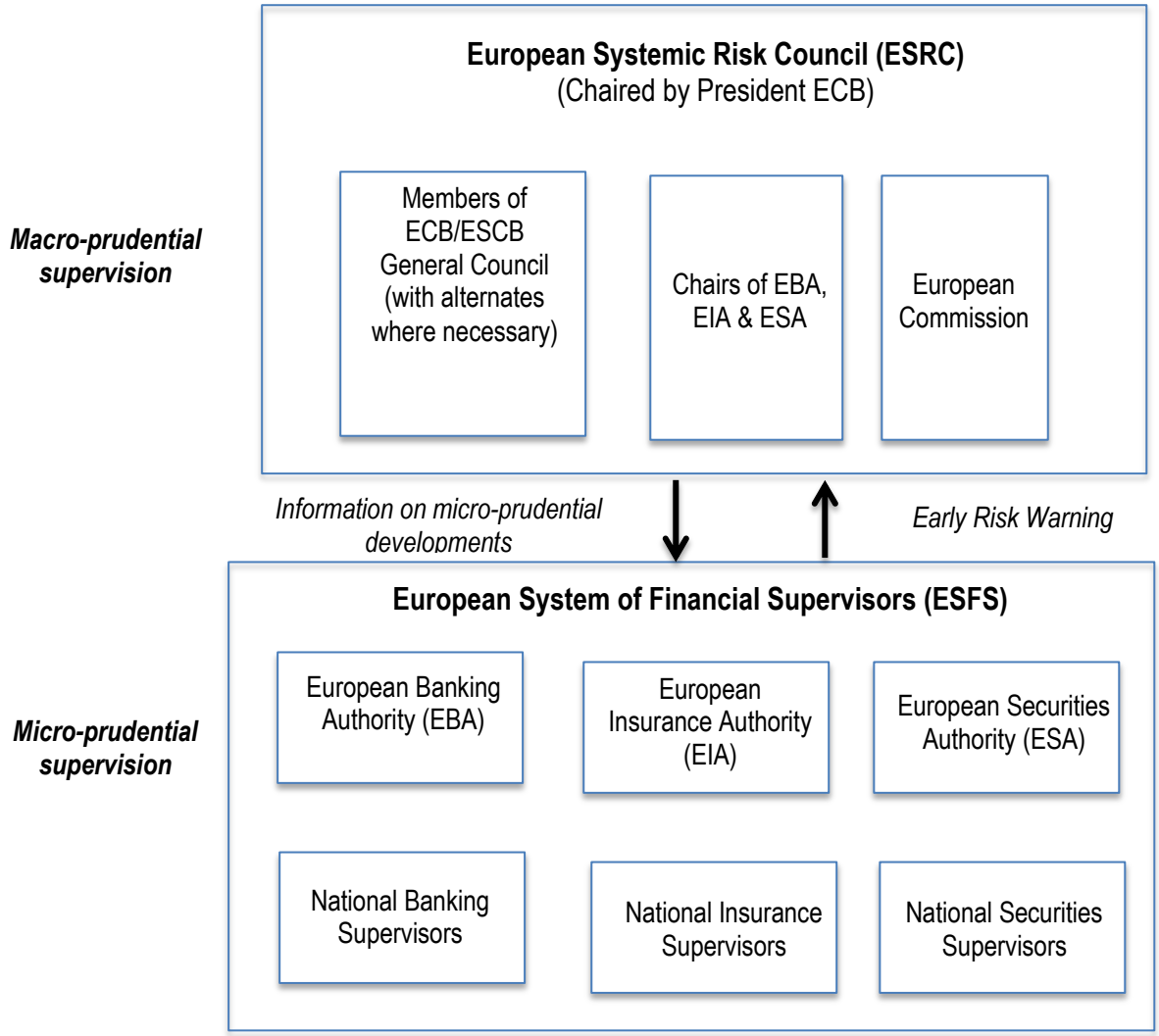

Figure 5.1 The de Larosière Report institutional proposal to improve regulation and supervision in the European Union

Source: de Larosière, "The High-Level Group on Financial Supervision in the EU". February 2009 pp.57

The micro-prudential supervision proposal suggests the need to establish a European System of Financial Supervisors (ESFS) where existing national supervisors will continue to carry-out-day-to-day supervision and three new Pan-European Authorities will be set up (the European Banking Authority or EBA; the European Insurance Authority, or EIA; and the European Securities Authority, or ESA).

Some of the main tasks of the Authorities are the legally required mediation between national supervisors, adoption of obligatory supervisory standards, adoption of required technical decisions applicable to individual institutions, oversight and coordination of colleges of supervisors, licensing and supervision of specific EU-wide institutions, compulsory cooperation with the ESRC to ensure adequate macro-prudential supervision, and strong coordinating role in crisis situations.

Baron Lamfalusy, who in 2009 advised the Belgian government on the reforming of financial architecture, expressed wide support for the de Larosière report, and contributed to this discussion by expressing that in his personal view, macro-prudential crisis prevention process comprises three stages[48]:

1. The collection of information, signaling developments in banks, financial intermediaries and markets that could give rise to crisis manifestations. The potentially most valuable source for this kind of information is micro-prudential supervision; but, since micro-prudential supervisors are neither trained nor mandated to detect such crisis signals, macro-prudential supervisors - coming from ECB/Eurosystem - should be sufficiently closely associated with the "traditional" supervisory activities to be able to identify any such crisis signals.
2. The second stage includes (a) the pooling of the information collected at the level of systemically significant individual banking groups and (b) the analysis of the aggregated figures. The ECB would have to play a key role in setting up and organizing the work of this team. According to the Recommendation 16 of the de Larosière Group: "A new body called the European Systemic Risk Council (ESRC), to be chaired by the ECB President, should be set up under the auspices and with the logistical support of the European Central Bank" Without an effective pooling of information and a scrupulously independent analysis, the European Systemic Risk Council will not be able to do its job (de Larosiere, 2009).
3. The third stage is the functioning of the risk warning system, under the auspices of the ESCR. This is a crucial part of the proposals: what has been missing so far has not only been the lack of information, of the pooling of information and of its analysis, but also the lack of policy reaction.

5.4.2 Lord Turner's Report

Published as "The Turner Review"[49], the Financial Services Authority (FSA, the UK's financial markets supervisor) version of an encompassing effort to diagnose the causes of the recent financial crisis and prevent something similar occurring again seeks to achieve five outcomes for the global banking regulatory and supervisory framework:

- That the global banking system is better capitalized and more resilient to liquidity shocks throughout the business cycle;

[48] IMF-NBB-Bruegel Conference, Policy Panel 2 on 24 March 2009.

[49] The Turner Review was made public, along with the FSA Discussion Paper 09/2: A regulatory response to the global banking crisis, on March 18, 2009.

- That the regulatory framework in general, and its capital component in particular, are explicitly counter-cyclical;
- That the supervisory, crisis management and resolution arrangements for cross-border financial services groups are effective and reflect the interests of host countries as well as those of the home state;
- That any material risks to financial stability posed by unregulated activities or firms are identified and controlled to the extent possible; and
- Those macro-prudential and other risks to financial stability are identified at both the international and national levels and effective action is taken to mitigate them.

The Turner report aims to correct what went wrong in the recent crisis. To that end, it suggest there has to be an increase in international cooperation in supervision through closer communication of colleges of supervisors, as well as more intense international cooperation and coordination in crisis management, and a use of host country powers to require strongly capitalized local subsidiaries, and restrictions on intra-group exposures and flows.

The Turner's Review is organized around eight central axes, as follows:

- Increase quality of bank capital;
- Increase in trading book capital;
- Avoiding procyclicality in Basel II;
- Gross leverage ratio backstop;
- Contain liquidity risks;
- Credit ratings agencies;
- Remuneration in Banks;
- Regulation and supervision of cross border banks.

Increase the quality of Bank Capital: According to the FSA, it is necessary to evaluate what minimum ratios should be set for common equity, retained earnings and preferred stocks in banks. Due to the analysis made by the FSA, the Total Capital (preferred stock + subordinated debt) must be greater than 8% of the Weighted Risk Assets (WRA) and preferred stock must be at least 4% of the WRA.

Increase in Trading Book Capital: As the crisis broke, the Value at Risk (VAR) measures of risks proved that prices and market liquidity changed more rapidly than regulators had assumed. Therefore, Turner's Review suggests that a change in the trading book capital approach is necessary. Proposals adopted by the Basel Committee, planned for the implementation by the end of 2010, should make a major difference with requirements for VAR calculations, an incremental capital charge to cover default and credit risk mitigation, and increased charges for securitizations.

Avoiding Pro-cyclicality: The Basel II regime is often criticized for having pro-cyclical effects. This idea arises in practice depending on the design of the risk measurement models used by banks in their assessments, and in particular, if risk models are based on "point in time" rather than "through the cycle" estimates of loan losses. Basel II preferred "through the cycle" methodology because it is less procyclical. The problem is that several banks didn't develop effective "through the cycle" estimates before the launch of Basel II because they didn't have sufficient long historic records of past losses.

Gross Leverage Ratio Backstop: Gross leverage ratio refers to total assets to capital. Turner says there are 2 arguments for using a gross leverage ratio as a backstop control measure:

- Assets which are thought to be low risk can become highly illiquid and risky when systemic problems emerge, impacting asset sales related to the gross scale of the balance sheet positions.
- Calculating capital requirements based on internal models normally results in judgment between bank management and regulators, so a backstop against the impact of regulatory concessions is a good alternative.

Contain Liquidity Risks: Turner's Review suggests there are some important considerations in liquidity risk management, like the fact that during the current crisis, the simultaneous attempt by multiple banks to improve their liquidity position by shortening the tenor of their placements in the interbank market contributed to a collapse of liquidity. Also, that there has been a growth in the set of potential sources of liquidity making it difficult to base good liquidity regulation based on one or few standard ratios.

Credit Rating Agencies: The report suggests that regulation can solve issues relating to the proper governance of rating agencies and the management of conflict of interest. The recommendation in this case it that in the new legislation, European colleges ensure that appropriate structures and procedures are in place to manage conflicts of interest.

There is always a danger that the use of credit rating within the Basel II capital adequacy rules may introduce a new element of procyclicality in future: However, Turner's Review comments that other measures of assessing risk are more procyclical.

Remuneration in Banks: It is likely that remuneration policies, in combination with capital requirements and accounting rules, created incentives for some executives and traders to take excessive risks in the past. The Financial Services Authority (FSA) published a Code where it states a set of principles which are expected to better align remuneration policies with appropriate risk management. Some of the guiding principles included in the Code are:

- Firms must ensure that remuneration policies are consistent with effective risk management.
- Remuneration committees should reach independent judgments on the implications of remuneration for risk and risk management.
- Remuneration should reflect an individual´s record of compliance with risk management procedures, rules and appropriate culture, as well as financial measures for performance.
- Financial measures used in remuneration policies should entail the adjustment of profit measures to reflect the relative riskiness of different activities.

Regulation and Supervision of cross border banks: The effective supervision of large cross border institutions can be improved by maximizing the flow of information between home and host country supervisors. In order to do this, the Financial Stability Forum defined the objective that all major cross border financial institutions should be covered by a "college of supervisors".

Besides the Larosière and Turner reports, which represent the official position of the European Commision and the Financial Sevices Agency respectively, the subject of new regulatory mechanisms and institutions for the EU financial markets has been discussed extensively by academicians,

politicians and several multilateral financial institutions (IMF, BIS, OECD, World Bank, etc), and by the ECB, of course. Most of the positions coincide in that banks should expect a far higher level of regulatory intervention and that the transit to a new system is likely to take places sooner than later. However, one of the areas of greater debate is centered on the issue of which regulators should regulate what institutions. The Larosière report explicitly affirms that the current regulatory financial framework of the EU lacks coherence, the main reason being the excess of discretion granted to national authorities, a problem that was detected since the initial steps of the Single Financial Market, but that has not found a satisfactory solution yet. There is no possible doubt that a single unified economy requires a single financial regulatory framework, but at the same time there are important political obstacles before a thorough reform of the current national regulations finally converges into a single EU financial regulation and supervision. Even while the national regulations are not likely to be replaced in their entireness in the short run, all regulated financial services firms, banks and non-banks, must expect a significantly stricter regulatory overview. The enormous cost of the recent financial crisis is a powerful argument to push through the reforms more quickly that would normally be expected. At this stage, the question is no longer whether there will be significant changes in the regulation of the EU financial industry, but in which areas will more intervention is most likely to occur and what will be the timing for that.

5.5 Concluding remarks

The current financial regulation in the EU presents a number of inconsistencies due to national regulatory schemes which, analyzed *ex-post-facto*, may help explain why the damages to European financial institutions were so widely generalized. Among several other aspects that require closer scrutiny, obligations reporting standards are very diverse from one country to another, especially for non-listed firms because they have no obligation to make public their financial reports. The existence of diverse accounting practices for pensions causes serious distortions in the calculation of fund in different nations. Also, the utilization of different methodologies to calculate risks faced by financial institutions makes it very difficult to achieve valid comparisons and establish prudential rules. Some EU countries have an extended definition of credit institutions while other members have much more limited definitions and such differences between members can lead to laxer supervision and regulatory arbitrage.

The recent financial crisis showed that the very complex and uneven financial system gave room to arbitrage opportunities, inefficiencies, and huge differences in the constraints that institutions face in very similar economic activities. The most striking example is that of the shift in subprime mortgage originations to less regulated institutions or the shift in risk to where accounting is more favorable. A post-crisis financial framework should focus on simplifying and making the system more uniform as a whole; rules should apply evenly to entities involved in similar functions.

The crisis proved there is an urgent need for better regulation on capital reserve requirements and requirements on liquidity and reserves should be based more on future forecasts of economic cycles. That is particularly important for institutions subject to risk-based capital requirements like banks, so that it may act as a stabilizer in periods of economic crisis.

The re-regulation of the financial industry efforts are already present in most EU countries (more so in those severely affected by the crisis) but, there are still important differences in the approach each country is following. Although for several decades there has been a maybe too-slow convergence process in regulation of financial activity among EU members, the post-crisis convergence should move faster. However, we believe that even when convergence is a high priority, resulting regulations should still reflect idiosyncratic considerations, given the significant development differences that still exist among EU members. Although significant advances have been achieved, greater cooperation among national authorities in the would promote more efficiency in the provision of financial services, as well as greater stability and capacity to respond to unexpected volatility or other exogenous factors.

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Chapter 6

MARK TO MARKET ACCOUNTING AS A MAGNIFIER OF FINANCIAL CRISES

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MARK TO MARKET ACCOUNTING AS A MAGNIFIER OF FINANCIAL CRISES

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Abstract

The main objective of this chapter is to provide an analysis on whether mark-to-market accounting magnifies financial crises. Even though the results of numerous studies on this topic offer various conclusions, the majority of them conclude that fair value accounting, or mark-to-market accounting, does not cause financial crises. Most studies that had similar conclusions dealt with the 2006-2008 period, whereas we focus our research on period from 1881 to present day. Primarily, we will point out the historical context of the implementation of mark-to-market accounting and consequences it had. We consider the long term relationship between United States (US) GDP and the S&P 500 index values and key historical developments to conclude that implementation of mark-to-market accounting contributes to creating of asset bubbles and assets overestimations. Even though mark-to-market accounting does not cause financial crises, it does magnify fundamental procyclicality which is inherent in efficient markets.

Keywords: financial crisis, mark-to-market accounting, procyclicality.

6.1 Introduction

For the last forty years we had more financial crises, since the end of the Bretton Woods International monetary system in 1971. It is valuated that in US the subprime crisis alone since 2007 resulted in an 8 trillion dollar loss in share values. Crises are a product of powerful economic and non-economic forces; however, when a financial crisis emerges there are some factors that may make it

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stronger and increase its impact and duration. In decision making, business and especially accounting, faster and more available solutions may not be the safest, or the most fitting. In order to increase liquidity, residential mortgages were packaged in financial instruments and resold in the process of securitization, while at the same time being sold short by the same institutions that were promoting them. These instruments were also provided with high rating by the three largest credit rating agencies. Mark-to-market accounting has been used to disclose income in financial statements sooner and without market verification. Assets have been revaluated upward, but the problem with revaluations is that when write-offs occur they tend to exceed write-ups (Solomon, 1936:9). These write-downs are a reflection of the obsolescence not accounted for by depreciation. As a result, revaluations have an impact on capital and income. However, it seems that it has been cleared by many authors and by the Securities and Exchange Commission (SEC) that mark-to-market accounting didn't contribute to the financial crisis of 2008 and fall of many financial institutions. Nevertheless, in its defense, SEC and many authors noticed and pointed out that investors never complained when mark-to-market accounting increased their earnings, but reacted when the opposite occurred. There has been a growing consensus to revise the US Generally Accepted Accounting Principles GAAP, and as a result the SEC has been obliged to condone the analysis on whether mark-to-market accounting played a significant role and contributed to the financial crisis. The aforementioned study concludes that this method is not responsible for the crisis based on the following fact which is related to financial institutions: "The results of this analysis illustrate that the adoption of SFAS No. 157 and SFAS No. 159 did not have a significant impact on the percentage of assets that were measured at fair value, which changed from 42% as of year-end 2006 to 45% as of first quarter-end 2008" (SEC, 2008:57). The effects of this change in accounting however did not start in 2006, but much earlier in 1993. In order to come to a logical understanding of the implications of the change in accounting principles, it is necessary to continuously analyze the entire period stemming from it. We therefore define the main hypothesis of our investigation: Mark-to-market accounting has through the history of its use magnified the effects of financial crises. We also note that the FED's regulation and maintenance of artificially low interest rates played a large role in the creation of the crisis in the first place, but we take this fact as a constant in our analysis of this problem. Having in mind that many authors mention in their research that mark-to-market accounting has been invented just recently and that its implementation began in the seventies, we will first provide historical information on the implementation of this method and its legislation.

6.2 Literature review

Significant number of scientific papers can be found that debate the role of mark-to-market accounting in financial crises. This fascination does not fade even though it has been almost five years since the first effects of the current crisis. Most authors (like Shaffer, Scott, Laux and Leuz) came to the conclusion in their findings that fair value accounting had little or no effect on financial crisis occurrence and its amplification. However, Wesbury and Stein in their research from 2009 point out that mark-to-market accounting rules affect the economy and amplify financial market problems. As two main stabilizing factors of the financial market they note: time and growth. By using this rule of asset valuation we lose time because the market is pricing in more losses than they have actually, or

may ever, occur. Further, they note that decreases in capital by write-offs increase the possibility of asset fire sales and make the market even less liquid. The authors indicate that during the crises in the 1980s and the 1990s the absence of mark-to-market accounting gave banks time to work through problems.

Although fair value accounting has been implemented for a quite some time, there is a lack of guidance in studies on fair value determination and practice. Some authors like Dorestani *et al.* in their research from 2011, claim that out of 201 randomly selected universities of all regions of the US, there is no single university offering any stand-alone courses or programs of fair value accounting. Likewise, most authors conducted research proving whether fair value accounting was the main cause of financial crisis occurrence, as opposed to a contributing factor. Nonetheless, it seems clear that financial crises are created due to numerous factors and the real issue with fair value accounting lies with the fact that it might have magnified previous and may magnify future financial crises.

In October 2007 it was published that the total losses from subprime mortgage loans and respective bonds is estimated at USD 250 billion. Ten American banks managed to create a USD 70 billion liquidity fund, but no mention was made of investing three to four times more money in a larger fund in order to prevent possible avalanche effects. One year later, in the wake of the first blow of the crisis, when it was clear that the global economy was entering a recession, the first review of the global economic growth projections until 2015 was made. The difference between the new, lower and the previous growth path was USD 4,700 billion (nearly 19 times the total loss from subprime mortgage loans). Finally, at the end of November 2008, after the situation in the global financial markets partly settled, a detailed record of the decrease in the consolidated values of all shares and bonds had been made. The total recorded loss was USD 26,400 billion, which is over a hundred times the total value of the contentious mortgage loans. A one-time tax of 1% on the value of all shares and bonds in October 2007 would have been sufficient to entirely cover the financial gap which caused the crisis on a global scale (Vujovic, 2009:36).

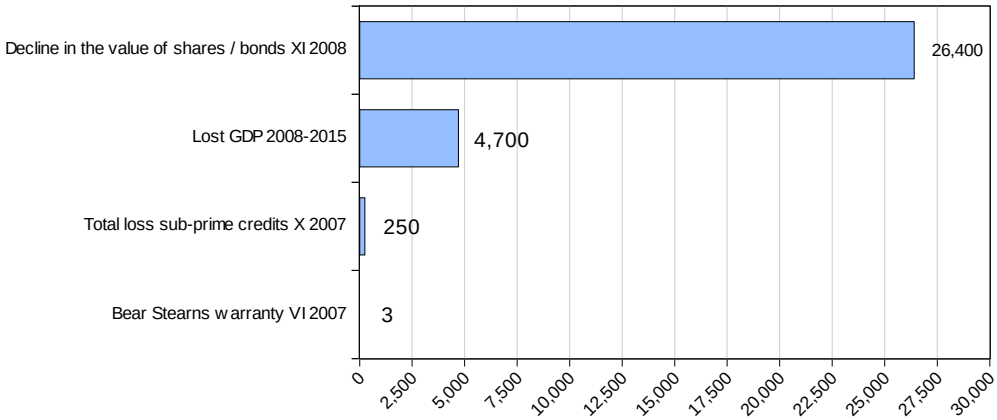

Figure 6.1 Spread dynamics of the crisis costs

Source: (Vujovic, 2009:38)

The global economic crisis of 2008 showed that the source of risk is not a poor business decision of an individual bank (inappropriate loan, bankruptcy of a company, etc.), but the collapse of one type of financial instrument (sub-prime mortgage loan) in the circumstances of over-indebtedness, poor regulation and high degree of interconnectedness at the national and global levels. Therefore, it

is a systemic disruption which simultaneously affects a large number of banks in the country (US) and in the world.

Today most banks provide liquidity by short-term borrowing on the financial markets. Banks facing the problems with assets rapidly lose a rating, thus automatically losing access to the favorable financing. Maturity of the existing short-term liabilities owed to the banks causes a gap in the sources of funds which can be closed either by additional private financing sources or by capital increase. If it fails, the only solution is sale of assets or use of reserves in order to settle maturing liabilities.

In the circumstances of systemic risks, none of these methods gives good results. In a disrupted market there is no demand for risky assets, nor are additional capital sources or alternative long-term private financing sources available. Since many banks offer plenty of assets for sale at the same time, the price falls further and jeopardizes even the minimal provision of capital. It creates additional selling pressure for even more assets in order to maintain at least minimum capital coverage and basic solvency. These two mechanisms are mutually enhanced and cause further deterioration of the conditions in the assets market. Capital coverage is very soon depleted and the liquidity problem becomes a solvency problem.

To make things worse, financial markets respond to the crisis by excessive contraction and a drastic credit crunch. Financial institutions that were not affected by the initial crisis of sub-prime mortgage assets could be affected by a rapid decrease in available loans. In the circumstances of high degrees of securitization, it is very often necessary to refinance considerable portions of short-term funding sources. If it happens that sources in the financial markets fail due to entirely exogenous factors, financial institutions may be involved in the whirlpool of the crisis without immediate participation in the transactions that caused its first cycle (Vujovic, 2009:41).

Based on the above mechanisms, the toxic assets spread very fast from the specialized banks and other financial organizations that were primarily dealing with sub-prime mortgage loans to all other players in the financial markets of the US and other countries, as well as to the new markets. Thanks to massive liquidity interventions taken by the Fed and other central banks of the developed countries, in the following months the situation was partly improved and prices stabilized; however, it was not sustainable in the long run. The asset price crash started with the outbreak of the global financial crisis in September 2008. At that time, toxic assets spread not only to all segments of the financial system of the developed countries, but also reached through credit channels the new market, thus dominating all segments of the global financial system. A narrow definition of toxic assets confines it to mortgage backed securities and related derivatives and has been estimated at USD 2 trillion. It has been proposed that the best solution for these assets should be reverse auction. This method can be an effective way to buy homogeneous assets, but it does not work well with mortgage-backed-securities because this market is much more fragmented than the market for corporate bonds (Pozen, 2010: 243).

All of the above reasons for the occurrence of the global economic crisis had another key consequence. A decrease in real interest rates caused an increase in prices of property, i.e. assets. This means an increase in securities and real estate, which was made possible by the use of mark-to-market value. Namely, this method, as a method of financial instruments valuation, contributed to an increase in the asset value, because, as compared to the historical value, the mark-to-market value of a financial instrument in the circumstances of economic prosperity is considerably higher. It allowed

further debt to be incurred, which consequently led to illiquidity, first of the banking sector and then of the overall economy. However, in periods of turmoil, financial institutions are forced to write down the value of trading assets below their true economic value. Therefore, mark-to-market accounting, while well intended, could have unintended consequences of exacerbating economic downturns (Shaffer, 2010: 5).

6.3 Mark-to-market accounting and the great depression

Mark-to-market method, or fair value accounting, has been integrated in the US financial reporting system for a long time. The first evidence of fair value implementation dates to before the Great depression, long before the current crises. In 1921, the XXXI issue of the Journal of Accountancy, the authors mention an implementation of fair values for measurement of taxable income of buildings that had been sold and refer to established rules and principles that had been established at the beginning of 1913 (Rusk, 1921). At that point in time, the balance sheet had superiority over the income statement. However, at the end of the 1920s and at the beginning of the 1930s, the income statement had prevailed since shareholders demanded more information about their investment. Significant utilization of fair value had been recorded at this point which was also referred to as current value or appraised value, for asset evaluation (SEC, 2008:34). However, there have been no accounting regulations or accounting standards issued that required the use of fair value, still many entities used this method for evaluation of their assets. By 1920, the historical cost model departed financial statements almost completely, and mark-to-market accounting took over. The Great depression had almost the same symptoms as the 2008 crisis: implementation of fair value, huge writes-up and writes-down, and great mortgage debts.

Following the Great depression, the implementation of mark-to-market accounting faded, and after 1938 it had been almost completely abandoned. In fact, it had been practically forbidden by SEC release No 4 in 1938, where it stated that financial statements should be considered misleading or inaccurate if they lack significant authoritative support (Benston, 1973:133). By the end of 1940 the write-ups of assets almost completely disappeared from financial reporting since they had been unofficially banned. Conservative accounting methods had once again been embraced. However, the revival of mark-to-market accounting began in 1970 with declaration of authoritative accounting literature that proscribed the use of fair value in certain transactions. This announced a significant and dominant use of mark-to-market valuations, having in mind that before this event accounting practices had been diverse. The same year, FASB issued SFAS 12 that enforced all marketable equity securities to be reported as the lower of cost, or fair value. Approximately from their point further, financial crises lasted longer and had a stronger effect on the worldwide economy in comparison with previous ones.

6.4 Legislation on mark to market accounting in United States

The primary users of financial statements are investors who seek the relevant information about entities' profitability, liquidity and financial situation. All entities that trade on stock exchanges have the obligation to prepare financial statements according to specific rules and principles which

provide the universality and objectivity in financial reporting for all participants. The availability and preparation of financial statements; and the establishment of accounting standards are the main responsibilities of the SEC. The Financial Standards Accounting Board (FASB) is the body accountable for developing accounting standards and pronouncements. The chronology of standards related to fair value issuance is presented in Table 6.1.

Table 6.1 Order of issuance of mark-to-market accounting related legislature

	Issued on	Effective from	Legislative	Description
1.	December 1975	Superseded with SFAS 115	SFAS 12	Accounting for certain marketable securities
2.	December 1991	December 15th, 1992	SFAS 107	Disclosures about fair value of financial instruments (amended by SFAS No. 126)
3.	May 1993	December 15th, 1993[54]	SFAS 115	Accounting for certain investments in debt and equity securities
4.	October 1994	Superseded by FAS 133|	SFAS 119	Disclosure about derivative financial instruments and fair value of financial instruments
5.	June 1998	June 15th, 1999	SFAS 133	Accounting for derivative instruments and hedging activities
6.	February 2000	/	Statement of financial accounting concepts 7	Using cash flow information and present value in accounting
7.	June 2001	July 2001	SFAS 141	Business combinations
8.	2007	December 15th, 2008	SFAS 141 Revised	Business combinations
9.	June 2001	December 15th, 2001	SFAS 142	Goodwill and other intangible assets
10.	August 2001	December 15th, 2001	SFAS 144	Accounting for impairment or disposal of long-lived assets
11.	February 2006	September 15th, 2006	SFAS 155	Accounting for certain hybrid financial instruments
12.	March 2006	September 15th, 2006	SFAS 156	Accounting for servicing of financial assets
13.	September 2006	November 15th, 2007	SFAS 157	Fair value measurements
14.	February 2007	November 15th, 2007	SFAS 159	The fair value option for financial assets and financial liabilities
15.	March 2008	November 15th, 2008	SFAS 161	Disclosures about derivative instruments and hedging activities
16.	October 2008	October 3rd, 2008	Report and recommendations pursuant to section 133 of the Emergency economic stabilization act of 2008	Study on Mark-to-market accounting

Source: Adapted from: http://www.fasb.org/home

6.5 The relation between the issuance of mark-to-market accounting standards with the overvaluation of real estate

In an attempt to prove that there exists a relationship between using mark-to-market methods and asset price inflation, we will chronologically analyze the S&P 500 index as the best reflection of the regulatory changes. We will however use the Shiller Barclays CAPE Index which reflects cyclically adjusted price-to-earnings ratios (CAPE) since it has been a key driver for the valuation of sectors.

The numerator of the CAPE index is the real (inflation-adjusted) price level of the S&P 500 index, whereas the denominator is the moving average of the preceding 10 years of S&P 500 real

[54] For entities with total assets less than $150 million effective implementation of this standard began on December 15th, 1995.

reported earnings (Wilcox, 2011:1). The US Consumer Price Index is used to adjust for inflation and the purpose of averaging 10 years of real reported earnings is to control for business cycle effects. The aforementioned index has been defined by Robert Shiller and John Campbell in 1988 and is generally used by investors with a buy and hold strategy and a multiyear time horizon. The Barclays ETN+ Shiller CAPE ETN investment fund tracks the Shiler Barclays CAPE US Core Sector Index. This fund invests in the four most undervalued sectors among the nine S&P 500 sectors, based on their cyclically adjusted price to earnings ratios (Ho, 2012:1).

Table 6.2 shows the movement of the average values of the CAPE index for a period of 31 years, ending in 2012. For the analysis we have used Change-Point Analyzer, a shareware software package for analyzing time ordered data to determine whether a change has taken place and when the change occurred. This software detects multiple changes and provides both confidence levels (that change occurred) and confidence intervals for each change; the results of analysis are clearly displayed in table form.

Table 6.2 Significant changes for the CAPE index

Date	Confidence Interval	Conf. Level	From	To	Level
3.1.1927	(3.1.1927, 3.1.1927)	100%	14,42	15,039	3
4.1.1995	(4.1.1995, 4.1.1995)	100%	15,039	25,605	1
6.1.1997	(6.1.1997, 6.1.1997)	100%	25,605	36,44	3
7.1.2002	(7.1.2002, 7.1.2002)	100%	36,44	25,223	2
10.1.2008	(10.1.2008, 10.1.2008)	100%	25,223	19,8	3

Source: Authors data

Note: Confidence Level for Candidate Changes = 50%, Confidence Level for Inclusion in Table = 90%, Confidence Interval = 95%, Bootstraps = 1000, Without Replacement, MSE Estimates, Level 1-3 Changes.

The results show that the largest differences in average CAPE index values appeared in 1927, right before the onset of the great depression, when the use of mark-to-market methods was almost at today's high levels. Subsequently, the first significant differences in average CAPE values appear in 1995 and 1997, which reflects the implementation of the accounting standards put in place in 1991, 1993 and 1994. These results are expected considering the fact that this method had been prohibited before the 1990s, so an acclimatization period was expected. After that we notice a significant change in average index values in 2002 as a result of the first bubble, and in 2008 as a result of the second, and current world economic crisis. Figure 6.1 presents the changes in CAPE index averages from 1881 to 2012.

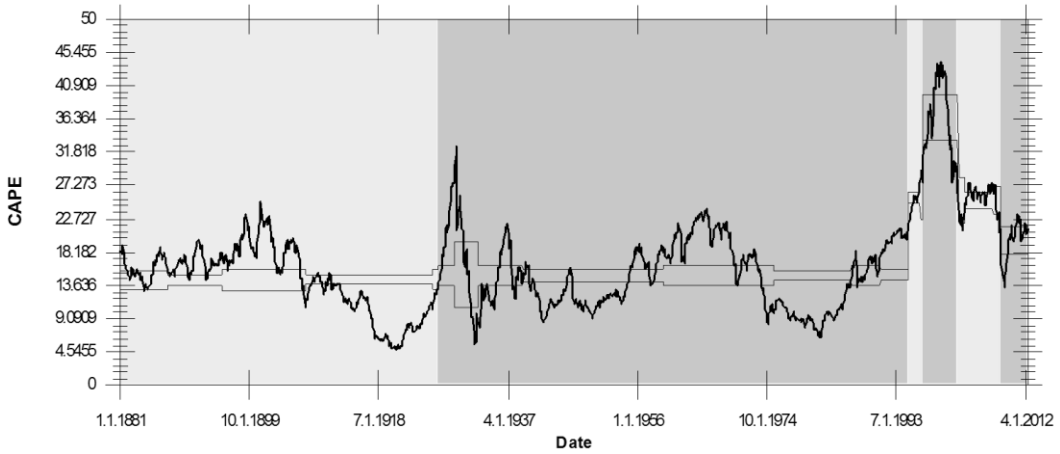

Figure 6.2 Significant changes in CAPE average

Source: Authors data

In Figure 6.2 we notice larger oscillations in the movement of average CAPE values starting from 1913-1914, which is exactly the period where mark-to-market methods were extensively used in practice. A more stable period is seen up to 1974-1975, while these practices were forbidden, but were subsequently reintroduced. We note similar erratic CAPE average movements in both waves of mark-to-market introductions which follow average CAPE declines. This confirms the assertions of authors like Pozen who favors this method in the sense that it offers greater transparency of property values than the historical cost approach. Protagonists of the mark-to-market approach often cite that the historical cost model does not reflect the current value of assets in the balance sheet and significantly understate them. In the case of a growing economy, this method has a much stronger opposite effect of overstating capital values through financial statements.

Figure 6.2 also shows that greater oscillations in CAPE index value begin in 1913 and 1914, which collides with greater implementation of mark-to-market method. We also point out that FED was formed in 1913, as well and that FED started printing, money so oscillations are definitely due to this situation. After 1971 when this method has been reintroduced, first oscillations occur in 1974-1975. It should be noted that similar behavior occurs at the beginning of mark-to-market implementation, the first and second time, namely CAPE value decreased. This confirms the findings of authors who claim that this method provides higher transparency in assets valuations, in comparison with historical cost method. However, in conditions of overall prosperity this method has the opposite effect, since assets overestimations tend to quickly reflect in financial statements.

Quarterly financial reporting compounds the previously described effect which results in overvalued estimates of holdings and creates bubbles. Also, the combination of the nature of financial instruments and interim reporting might be the reason why current crisis has such a devastating effects. Frequent financial statements tend to destabilize share prices. Quarterly interim financial reporting appears to induce greater capital market volatility than semi-annual reporting (Mensah and Werner, 2008:74). Valuation of financial instruments is more frequent and very demanding compared to the other assets, since sometimes it requires subjectivity in estimation. In overall prosperity and price booms, financial instruments get overestimated and as such, appear more frequently in financial instruments of one company. Such values of financial instruments when they are traded appear in financial reports of other companies and so on. Based on this, beginnings of crises can be expected in countries where mark-to-market methods have matured the most, leverage is highest, financial

market is developed and where financial reporting is done quarterly, which makes it understandable that the financial crisis of 2008 hit the US harder than Europe.

The Figure 6.2 also shows that during periods of growth, the effects of mark-to-market accounting are three times greater than during times of crisis. This indicates that the institution of this type of accounting does not create crises, but only serves to amplify their negative effects once they are already present compared to alternate methods. The following discussion will outline the more and less obvious characteristics of mark-to-market accounting.

6.6 Mark-to-market accounting mechanism

6.6.1 Necessity of financial reporting

Financial statements present a traditional source of information in the decision making process. However, this dependency is not absolute since a company may have high net income at the same time may not be liquid, however the effect of data presented is far from irrelevant. Why do people believe so much in financial statements? Why do they require financial statements so much? The main goal of financial statement's stakeholders' is estimation of financial stability and profitability. In these estimates "anchoring" plays important role, since people seem to be influenced by the magnitude of cued numbers or actions. The initial value or the "anchor" presented in financial statements can serve as a mental benchmark or starting point for estimating future earnings of financial instruments (Poundstone, 2010). These adjustments are usually inadequate and it seems that the anchor has a magnetic attraction, luring the estimates closer to them. Anchoring is constrained by whatever people believe or want to believe to be true (Poundstone, 2010).

Now, imagine if initial values are biased, on whatever level, and add to that the adjustment the investors will conduct; what would be the ultimate result? Would these estimates reflect the real situation? There is another side of this effect as well, the investors would definitely deny the influence of anchor information on their estimations and most likely would ignore the real data given, pointing out that they are "skillful" enough to make the estimates by themselves. As it has been beforehand stated, people tend to react to factors from surroundings. In the case of investors, those factors should be the general trend of market earnings and the development of the economy. It is supposed that people are inclined to risk more prosperous economies in, which could be connected to the abovementioned statements that investors will estimate future earnings based on anchor information with higher optimism. On the other hand, in difficult conditions investors will certainly decrease the estimated earnings value even more than the upward value in prosperity, which has already been shown.

Although it may sound unbelievable, accounting has been a stabilizing factor of world economics for centuries. It seems that the Great depression and now World financial crisis both had lesser effects on European countries than in the US Many authors point out the significance of International Financial Reporting Standards (IFRS) and suggest that the US should implement IFRS instead of, or as a supplement to Generally Accepted Accounting Principles (GAAP). Over 100 countries use IFRS in financial reporting of listed companies, the newest additions being: Brazil, Canada, Korea, China and India (Ohlgart and Ernst, 2011: 41). Accounting principles are usually considered as stabilizing factors in IFRS. GAAP are based on common law and thus define rules that

financial reporter should follow in special situations. On the other hand, IFRS are based on principles where financial reporter should define his actions based on general principle.

6.6.2 Association with accounting principles

While accounting regulators have been dealing with the harmonization of IFRS and GAAP for some time, it seems that the implementation of accounting principles is more established in those countries where IFRS are statutory. There is a suspicions that the going concern principle hasn't been implemented properly in countries that use GAAP, meaning that companies aren't regularly examining whether the company will continue its business in the future. However, we consider this as the final aspect of the mark-to-market accounting implementation which goes against some of the fundamental accounting principles.

The principle of prudence requires that revenue should be recorded when it is certain or realized, and a provision when an expense is conceivable. If a company has merchandise in inventory, it shouldn't report its value at market value because it would acknowledge the profits that may, or may not, occur in the future. Those assets should be disclosed at acquisition cost or purchase value. When using mark-to-market accounting, determined value could include in itself unrealized gains, especially if there is an illiquid market for a certain asset. Also, the problem occurs when an asset is to be revaluated, changes in value might never be realized. The consequences are:

- The balance sheet is overvalued and a total asset increase in value could be used for new debts, or if there are huge write-offs total assets depletion could have negative effect on restrictive clauses and capital requirements;
- The income statement may include losses that will never be incurred and profits that will never be realized.

The principle of reliability is usually interpreted as the quality of information that guarantees exclusion of any error and faithfully represented what it intends to represent. In normal market conditions fair value as market value presents a faithful estimate. However, there are situations demanding management's predictions and subjective estimates, where markets are illiquid and there is a lack of transaction on similar assets. This could result in miscalculations and manipulation of estimated values. Mark-to-market accounting in those situations may not produce reliable information. The principle of objectivity may not be fulfilled in previously described situations. This rule requires that information provided by financial reporting should be unfettered from any subjective estimation, meaning that estimations made by one accountant should be similar or identical, if possible, to estimations made by some other accountant. Far value accounting goes against these principles.

It seems that accounting regulators attempted to "soften" the accounting principles and implementation of the traditional, conservative, historical accounting method by introducing mark-to-market accounting. However, the main goal of this method was premature disclosure and recognition of future earnings that would not be disclosed if the historical method was used. The intention was that speculative characteristics of mark-to-market accounting should blend with conservative components of financial reporting resulting in a "perfect" combination of financial reporting. However, when conservative and speculative components are blended, characteristics of the speculative component prevail.

6.6.3 Association with impairments

As with the Great depression, the current financial crisis highlighted a significant number of impairments, especially in the area of intangible assets. Specific focus has been given to goodwill, because it can linger in balance sheets forever. Why did write-offs in intangible assets (goodwill) occur in both crises? Unlike other tangible and intangible assets, goodwill isn't calculated for amortization. In circumstances when stock price falls note worthily below book value, it's time to do a balance sheet makeover. This was a chance for many companies to toss out overvalued assets from their balance sheets. And goodwill was that golden reserve for many companies.

At the end of 2008, the average amount of goodwill reported by 419 companies of the S&P500 was $1.2 billion, whereas median write-offs for the first half of 2008 were $211 million (Mintz, 2009:72). The transaction of goodwill impairment is non-cash in its nature, which is fortunate because poorly governed companies usually don't have any cash to back up this transaction. Nevertheless, huge write-offs could have many consequences. Primarily, they can influence the behavior of investors, since many CFO's are afraid that disclosure of significant impairment can draw unwanted attention of investors and decrease the stock value in the long run. On the other hand, there are authors that claim that investors can discern difference between write-offs that will improve performance and write-offs that will not. Also, disclosure of impairment doesn't automatically mean tax benefit, because tax deductions ordinarily occur when an asset becomes worthless and its value is zero. In all other cases, tax benefits will be omitted (Mintz, 2009:74). Investors are not the only stakeholders that companies should have on mind when deciding to conduct the impairment. Write-offs affect the size of total assets and if they drop significantly to disrupt financial ratios that lenders use as a main instrument to signal trouble in a company (debt-to-capitalization ratio), than management should think twice. Aforementioned circumstances of huge write-offs underlines the importance of accounting methods used for asset valuations.

6.6.4 Association with Gross Domestic Product

The earnings of a country could be measured by the Gross Domestic Product (GDP). The basic assumption is that economic development will affect market earnings and the value of products and services. The beneficial growth of an economy should lead to higher market earnings which will be represented as higher GDP. This is what has been happening in US during the eighties and nineties, up until 2006. Between 2001 and 2006, corporate profits explained around 98.4% of domestic GDP growth (Mays, 2011:1). However, the stock market has been completely different story for the last several years, since it has become very turbulent. In a bull market, earnings are overvalued, and in a bear market earnings are overestimated. This is the main reason why S&P and nominal GDP do not correlate, although they should. S&P 500 and GDP are not the same since S&P generates about less than a half of the earnings outside of the US from overseas sales and operations. Also, a quarter of the GDP (government earnings) of the US is not included in the S&P. However, the long term correlation is obvious; GDP has a very strong correlation with a corporation's earnings. This correlation has been even more obvious before we entered the period of volatility. The following chart presents the gap between S&P returns and nominal GDP growth.

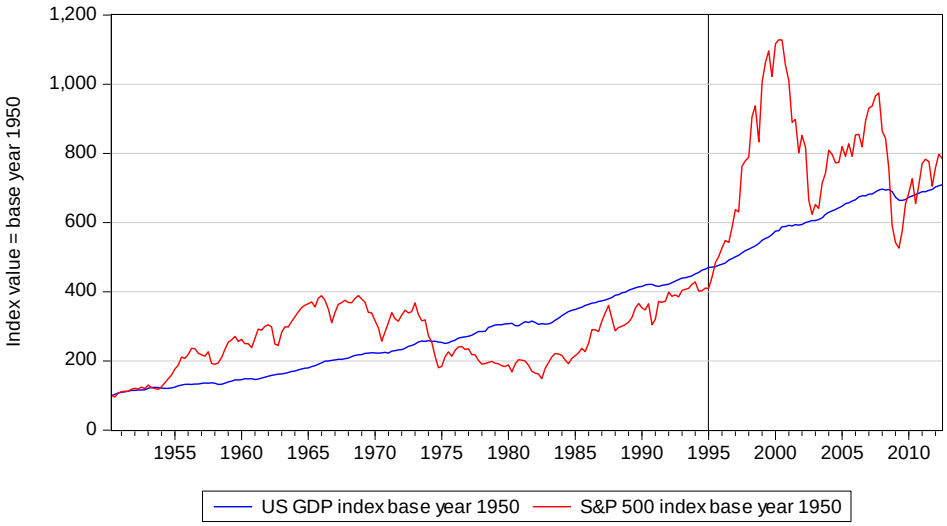

Figure 6.3 Gap between S&P returns and nominal GDP growth

Source: Authors data

The observed period in Figure 6.3 is from January 1st 1950 to August 1st 2012. For analysis purposes, we use the Change Point Model (CPM) in the R software package. The Segment Neighborhood method is used with the assumption of a normal distribution of average CAPE index values. We notice the point at which average CAPE index values changed in Figure 6.2. The change point date is identified as March 1st, 1995, which coincides with the introduction of regular implementation of mark-to-market accounting practices. The average CAPE value before this date was 15.37024 and after this date is 27.32488. Even though it cannot be concluded that GDP and the S&P 500 are not synonymous, an increase in GDP (under the assumption of stable net margins) is a good indicator of increasing capital values. In situations of stable GDP growth (as seen in Figure 6.2), it can be seen as the aggregated value of the market capitalization of the 500 largest companies. Figure 6.2 also shows that the movement of the S&P 500 index behaves similarly after the reduction of mark-to-market accounting practices (1975). We again notice a fall in index values compared to GDP, which would again turn around after 1995 (after their reintroduction).

6.6.5 Association with pro-cyclical effect and leverage

Proponents of the mark-to-market accounting method often state that this methodology improves transparency and reveals inherent volatility, but does this transparency create a new type of feedback loop volatility as a byproduct. If this is true, we can argue that additional transparency comes at an unjustifiable economic price.

When it comes to implications for investors, it is well known that investors and financial institutions accept higher risk in order to achieve increased returns when an economy is in the high phase of the cycle. However, this also leads to higher credit borrowing and leveraged expansions. Also, a well-known phenomenon is the effect of the balance sheet. Implementation of mark-to-market value leads to asset, namely financial instrument, overestimation during market growth. This results in stronger balance sheets, higher amounts of assets and capital presented in balance sheets, which raises the willingness of lenders to decrease the credit rate and extend credit. This ultimately leads to

additional capital borrowing. Increased leverage causes higher earnings and equity presented as OCI, which leads to stock price appreciation. It seems that risk evaluation by investors and financial institutions is based on recent history of market trends, so in periods of prosperity their actions seem to be over exaggerated.

Based on the investigation of the SEC of all assets that were reported at fair value, a majority (76%) of the assets were Level 2 instruments for which inputs were observable, followed by Level 1 instruments (15%) which had quoted prices, and Level 3 instruments (9%) where significant market information is not observable (SEC, 2008:60). In situations where management subjectively ascertains values of capital possessions, it is logical to assume that these values tend to be inflated. However, in a financial system in which balance sheets are continuously marked to market, asset price changes appear immediately as changes in net worth, prompting financial intermediaries to adjust the size of their balance sheets (Tobias and Song, 2010:418). On the other hand, as a reaction to increased company capital, leverage is increased (especially in investment banks). In this situation, leverage and total assets tend to move in lock-step (Tobias and Song, 2008:3). This happened not only in 2008, but also in 1998. The early part of 1998 saw strong growth in total assets, with the attendant increase in leverage. However, the third and fourth quarters of 1998 shows all the hallmarks of financial distress and the attendant retrenchment in the balance sheet. For most banks, there were very large contractions in balance sheet size in the fourth quarter of 1998, accompanied by large falls in leverage (Tobias and Song, 2010:15).

We therefore underline that the consequences of mark-to-market accounting are greater transparency in the declaration of capital values, but also greater volatility in business cycles. Exaggerated profits in good times create the wrong incentives. Conversely, more uncertainty surrounding valuation in downturns may translate into overly tight credit conditions, and negatively affect growth at a time when credit expansion is most needed (IMF, 2008:123). To sum up, asset appreciation momentum leads to institutional shareholders gain; this again leads to a positive feedback loop. Nevertheless, when negative event occurs, like the Lehman Brothers crash, such investor's risk evaluation violently fluctuates. Previously stated are economic and psychological factors that lead to pro-cyclical investor's behavior during the recession. Furthermore, Chea noticed some interesting manifestations of this method's implementation: "fair value reflects the effects of changes in market conditions and changes in fair value reflect the effect of changes in market conditions when they take place" (Chea, 2011:15). It should be mentioned, as well, that rating downgrades of one firm could create pressure for the downgrades of other firms, in a form of feedback effect not studied in the current paper (Manso, 2011:4).

The fear from pro-cyclical behavior can be seen in Europe as well, where they already examine the countercyclical regimes that would help banks to save capital in beneficial years. Many authors believe that capital adequacy rules did not have a significant effect on the debris of big financial institutions; however Europe's national regulators suggest discretion when using these rules in times of distress.

6.6.6 Association with systematic risk

At first glance, valuating assets in financial statements does not have many points of contact with systemic risks; however, valuating property does. As opposed to the risk that one company will stop functioning, systemic risk entails the entire sector stops functioning (ex. the banking sector). The implementation of this method has a doubly negative effect on systemic risk.

Overvaluing property in one company and changing the standards that allow this type of reporting only shortsightedly reduces its bankruptcy risk. However, in the long run, systemic risk is greatly increased. Stronger financial statements influence credit rating agencies to give more positive scores, which influences financial institutions to offer more credit to such companies. The former is not economically justified because such companies do not deserve this extension of credit that is created due to mark-to-market accounting. Such occurrences not only impact the financial instruments market, but have an effect on the overall economy.

An increase in the value of financial instruments overflows into the property market which causes property bubbles. This breeds an additional impression of overall prosperity on the stock market which is then spread to the whole economy including the real estate market and landing activities. The real estate values played their role as well, since they use methods for valuation which are comprised of general rate of return. The constant increase of these rates gradually and unduly increases the value of real estates. The increase which was contained in financial instruments is now set free on the market. The housing market was susceptible to a bubble because of the long period of decreasing interest rates and lack of diligence and alertness exhibited by mortgage institutions. All of this impacts the level of systemic risk.

There is another form of negative impact of mark-to-market accounting on systemic risk. For a system to function properly there must be a balance between supply and demand. Companies, especially banks, come into the possession of assets that are drastically overvalued. There are 2 solutions to this problem: selling assets at fire-sale prices, or keeping these assets on the books and reporting amortization losses. The choice of the best solution depends on the style of management of the company, but in both cases will result in increased systemic risk through oversupply or over-demand. Systemic risk is increased, and firm specific risk is decreased in the short term, due to the dumping of toxic assets.

6.7 Conclusions

We reaffirm that mark-to-market accounting did not cause the financial crises, but it enabled it to happen and amplified its consequences. While the mark-to market-rule does not cause financial crises on its own, it does magnify the underlying market volatility caused by the positive feedback mechanism inherent in efficient market economies. Mark-to-market accounting does not only reveal volatility, it is also generates it. It does deliver more of the market risk in every single portfolio. It tends to stabilize market returns in periods of positive feedback, but doubly or triply destabilizes them in periods of negative feedback. It breeds an additional impression of overall prosperity on the stock market which is then spread to the whole economy including the real estate market and landing activities. It also affects the level of systemic risk. It is clear that regulatory bodies notice the negative consequences of the implementation of this method and the fact that it played a significant role in

financial crises through the history of its use, which makes it understandable that they wish to educate accountants and auditors about its use. Since the beginning of the latest crisis most new standards or changes in existing standards were made to mark-to-market principles. We also want to point out that although we advise against mark-to-market implementation in certain situations, all of the above mentioned arguments against mark-to-market method cannot be automatically translated into arguments for historical cost accounting or any other methods. Therefore, we propose that official financial statements should be disclosed at historical value, however we suggest that companies should provide additional information for stakeholders using mark-to-market method for certain assets which value could be confirmed on market without subjective premises. In that manner, greater transparency would be obtained, without the negative effects of implementation of mark-to-market accounting.

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Chapter 7

MARKET TIMING ABILITY OF SOCIALLY RESPONSIBLE INVESTING FUNDS IN LUXEMBOURG

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MARKET TIMING ABILITY OF SOCIALLY RESPONSIBLE INVESTING FUNDS IN LUXEMBOURG

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Abstract

Socially Responsible Investing (SRI) funds are funds that undergo screening processes which satisfies the environmental, social and governance criterion for the benefit of all. This chapter investigates the market timing ability of SRI funds in Luxembourg. Luxembourg is the largest fund investment center in Europe and played an important role in promoting SRI funds. This study uses data from Eurekahedge database for 188 SRI funds in Luxembourg for the sample period of January 2001 to December 2011. We employ two market timing models, i.e. the four-factor Treynor-Mazuy (1966) model and Henriksson-Merton (1981) model for the analysis. We find that the SRI fund managers in Luxembourg are skillful. In other words, they are good in forecasting the market trends. Moreover, there is no size and momentum effects found but value effect is existed. We also find that the SRI funds have higher return during the financial crisis. Hence, we suggest that the SRI funds can be used as a hedging instrument during the crisis.

Keywords: Luxembourg, SRI funds, performance measurement, market timing.

7.1 Introduction

Socially Responsible Investing (SRI) no longer a new term in the financial markets. Rennebourg *et al.* (2008a) concluded that SRI not only provides the investors an attractive return but also the opportunity to contribute to the society through investment. The objective of SRI is consistent with the statement from Hamilton *et al.* (1993) that "doing well while doing good". Thereafter, SRI has a positive impact on the environment and society. In line with that, countries such as Belgium, Italy, Sweden and United Kingdom required their own country's pension funds to disclose the degree of participation in the social, ethical and environmental aspects (Rennebourg *et al.*, 2008a). However, throughout the years, debating on the performance of SRI funds is continuing as people argue that SRI funds tend to have lower returns than non-SRI funds due to lack of diversification. Although SRI funds provide the opportunity for the investors to do good, SRI funds can be considered as a less diversified portfolio that leads to higher risk.

The purpose of this study is to address the issue of whether the SRI fund managers have market timing ability to predict the stock market's movement and to change fund composition in accordance to the market condition. This chapter intends to answer this question for the case of Luxembourg. This is the first attempt that studies the market timing skill of fund managers in

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Luxembourg. We choose Luxembourg for two reasons. First, Luxembourg is one of a leading countries in Europe that actively developing SRI in the country recently. Evidence from the Foundation De Luxembourg[57] shows that Luxembourg is keen on developing and promoting the Philanthropy. Henry and Brion (2009) showed that 75% of the SRI funds distributed in Europe are Luxembourg domiciled. Second, favorable tax law in Luxembourg encourages funds managers to invest in Luxembourg in order to achieve higher excess return (Rennebourg *et al.*, 2011).

For investors, identifying fund managers with superior forecasting skill will be an important objective (Comer, 2006). Market timing skill is important for fund managers in order to forecast the general market movement in future and take necessary action to reap an attractive return of portfolio for their client. If a fund manager is able to forecast the market successfully, he/she can change the portfolio risk according to the market condition by altering the proportion of high and low risk securities in the portfolio (Kon and Jen, 1979). If the fund manager successfully forecast the market, the investor will earn abnormal returns relative to the respective benchmark.

The remainder of the chapter is organized as follows. Section 7.2 reviews the literature. Section 7.3 describes the data and the methodology and Section 7.4 discusses the finding of studies. Lastly, we conclude in Section 7.5.

7.2 Literature review

A considerable amount of literatures have been published to investigate the performance of SRI funds against the conventional benchmarks or funds. Previous studies (Cortez *et al.*, 2009; Galema *et al.*, 2008; Renneboog *et al.*, 2008b) showed that there is no significant difference between the performance of SRI funds and conventional funds or benchmarks. In other words, both performances are actually the same. Studies of Europe mainly in United Kingdom due to data availability (Gregory and Whittaker, 2007). More recently, literature has emerged in other European countries such as Netherland (Scholtens, 2007), Spain (Fernandes-Izquierdo and Matallin-Saez, 2007), Italy (Signori, 2009) and Asia-Pacific (Humphrey and Lee, 2011; Jones *et al.*, 2008).

Nonetheless, far too little attention has been paid to Luxembourg inspite of her active market. There are only two studies on Luxembourg which are Rennebourg *et al.* (2008b) and Rennebourg (2011). Rennebourg *et al.* (2008b) and Rennebourg *et al.* (2011) investigated the performance of SRI funds for 17 countries including Luxembourg. Rennebourg *et al.* (2008b) found that SRI funds from most of the countries were underperformed the market benchmarks significantly. Besides, Rennebourg *et al.* (2008b) also found that inverse relationship between SRI fund's return with screening intensity. Lastly, larger fund size is found to have a lower return for conventional funds but not for SRI funds. Rennebourg *et al.* (2008b) also found little market timing skill in the United Kingdom, US and continental Europe but not in the Asia Pacific. However, the market timing skill has not been examined for Luxembourg. To be more specific, we only discuss the finding for Luxembourg, Rennebourg *et al.* (2008b) investigated the performance of 12 SRI funds against 360 conventional funds in Luxembourg. The performance of 12 SRI funds is found to be underperformed the market. However, the performance of SRI funds and conventional funds has no difference.

[57] Fondation De Luxembourg is an independent body set up by the government that specializes in SRI in Luxembourg.

Rennebourg *et al.* (2011) focus on the investigation on the money flow into and out of SRI funds and whether the SRI investors are able to select funds that will do well in the future. They found that SRI investors from the US, United Kingdom and Asia Pacific regions care less about the past return than the conventional investors. However, market timing skill has not been examined in Rennebourg *et al.* (2011).

To the best of our knowledge, there is no single study in the literature focus on SRI funds in Luxembourg. We intend to fill this research gap here. In addition, the previous studies used small sample size. Rennebourg *et al.* (2008b) studied only 12 SRI funds and Rennebourg *et al.* (2011) investigated 43 SRI funds only. Our study which uses 188 funds could provide a more robust and comprehensive result than the above. Based on our literature search, there is no single study on market timing skill for SRI funds in Luxembourg so far. To the best of our knowledge, this is the attempt to investigate SRI funds in Luxembourg in a single country perspective.

7.3 Data and methodology

This study investigates 188 SRI funds in Luxembourg for the sample period of January 2001 to December 2011. The data is collected from Eurekahedge database. To minimize survivorship bias, following Cortez *et al.* (2009) and Humphrey and Lee (2011), we include died funds which survive throughout the sample period with at least 24 months return. Two reasons this sample period is chosen. First, the number of SRI funds launched within this period is the highest. Second, this study intends to study the effect of global financial crisis. Eurekahege is one of the world's largest alternative investment funds research house which specializes in hedge fund research. This database has an advantage that enabled us to collect all the required SRI funds at once. Risk free rate used in this study is Euribor 1 month and the market index is the Luxembourg stock market index, LUxX. Both data are obtained from the Banque Centrale du Luxembourg website[58]. The data for size, value and momentum factors are obtained from Style Research Pte Ltd.

We employ market timing model to determine whether the fund managers possess market timing skill. Stock selection skill is the prediction of an individual stock movement while market timing skill is the prediction of the general stock market movement. Stock selectivity skill of fund manager is indicated by the alpha in the CAPM model. Ideally, significant and positive alpha indicates that the stock selection skill of fund managers is excellent and vice versa. For market timing skill, as indicated in Treynor and Mazuy (1966), the characteristic line relates the fund's return and market return. Fund managers who possess the market timing skill will have quadratic behavior of market return. Treynor and Mazuy (1966) illustrated the market timing skill by including a quadratic term of excess market return into the single index CAPM model as follow:

$$R_{it} - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + \gamma(R_{mt} - R_{ft})^2 + \varepsilon_{it}$$

where

R_{it} = Return of fund i at time t

R_{mt} = Return of market or benchmark

R_{ft} = Return of risk free rate at time t

ε_{it} = Error term

[58] http://www.bcl.lu/en/statistics/series/03_Capital_markets/index.html

Manager with market timing skill will increase β during the market upturn and vice versa. Treynor and Mazuy (1966) explained that a positive β indicates the rates of return on the portfolio are more sensitive towards large positive market returns than large negative market returns. A significant positive γ indicates that market timing skill of the manager exists (Girard *et al.*, 2007). Insignificant or significant negative γ means the fund manager does not have market timing skill. If a fund manager does not possess market timing skill, he/she depends solely on the stock selectivity skill in order to achieve abnormal return. Thus, positive significant α indicates that the stock selectivity skill of fund manager is excellent whereas negative and significant α means that the selectivity skill is poor.

On the other hand, the conventional Henriksson-Merton (1981) model takes into account the hedging strategy. It is an improved model of Treynor-Mazuy (1966) and is widely used in the hedge funds study. Henriksson-Merton (1981) model is defined as:

$$R_{it} - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + \gamma \max(0, R_{mt} - R_{ft}) + \varepsilon_{it}$$

Henriksson and Merton (1981) explained that unlike the Treynor-Mazuy (1966) model, fund manager who wish to time the market only need to predict whether $R_m \geq R_f$ (uptrend) or $R_m \leq R_f$ (downtrend) and select β where $R_m \geq R_f$. Similarly, a significant positive γ indicates that the market timing skill exists. Likewise, negative or insignificant γ symbolized the non-existence of market timing skill.

Fama and French (1993) and Carhart (1997) found that size, value and momentum factors added value in explaining the return of portfolios. Recently, studies on market timing (Bollen and Busse, 2005) also incorporated size, value and momentum factors in the model. The size factor is SMB (the difference in return between small size and large size portfolios and HML (the difference in return between value and growth portfolios). We follow Lai and Lau (2010) to compute the momentum factor i.e. the top 30% decile is assigned as past winner portfolio whereas the bottom 30% decile is assigned as past loser portfolio.

As the 2008 global financial crisis hit the financial markets badly, financial investment performed worse than the usual period. To capture the effect of this crisis, we add a dummy variable to the market timing model. As stated by Mishkin (2010), the crisis started from August 2007. Hence, the dummy captures the period from August 2007 until December 2011. The four-factor Treynor-Mazuy model with dummy is defined as:

$$R_{it} - R_{ft} = \alpha + \beta_0(R_{mt} - R_{ft}) + \gamma(R_{mt} - R_{ft})^2 + \beta_1 SMB_t + \beta_2 HML_t + \beta_3 MOM_t + \beta_4 DUM + \varepsilon_{it}$$

where:

SMB_t = The difference in return between small size and large size portfolios;
HML_t = The difference in return between value and growth portfolios;
MOM_t = The difference in return between past winner and past loser portfolios;
Dummy = 1 for financial crisis period, 0 otherwise.

Similarly, we also incorporate size, value and momentum factors into the Henriksson-Merton model as below:

$$R_{it} - R_{ft} = \alpha + \beta_0(R_{mt} - R_{ft}) + \gamma \max(0, R_{mt} - R_{ft}) + \beta_1 SMB_t + \beta_2 HML_t + \beta_3 MOM_t + \beta_4 DUM + \varepsilon_{it}$$

A significant positive β_1 indicates that size effect exists. It means that the small size portfolio contributes more return than the large size portfolio. A significant negative β_1 indicates that size effect does not exist. Insignificant of β_1 means that neither small nor large does contribute any significant return to the portfolio.

A positive significant β_2 indicates that value effect exists. Value portfolio is often approximated by the high book-to-market ratio portfolio. When value effect exists, this means that the portfolio return is contributed more by the high book-to-market portfolio than the low book-to-market portfolio. However, a negative significant β_2 means the return of the portfolio is contributed more by the low book-to-market portfolio or also known as growth effect.

Likewise, a positive significant β_3 indicates that momentum strategy added value to the portfolio. It means that buying past winner portfolio and selling past loser portfolio will contribute higher return to the portfolio. However, a negative significant β_3 indicates that contrarian strategy contributes to higher return. In other words, the past loser portfolio contributes more positive return than the past winner portfolio. Furthermore, positive and significant β_4 indicates that the return of portfolio is higher during the crisis. Likewise, negative and significant means that the return is lower during the crisis.

7.4 Result

Table 7.1 exhibits the descriptive statistics of SRI funds, Euribor 1 month and LUxX. It is found that Euribor has the highest mean and LUxX score the lowest. In terms of risk as measured by standard deviation, Euribor 1 month has the lowest risk while LUxX has the highest. Moreover, SRI funds have lower risk than LUxX. If the risk is measured by the coefficient of variation, SRI funds have the lowest risk per unit of mean. We find that the distribution of SRI funds and LUxX is skewed to the right as indicated by the negative sign of skewness. For measuring the degree of fat tails, kurtosis value shows that the distribution has fat tailed except Euribor 1 month.

Table 7.1 Descriptive statistics of SRI funds, Euribor and LUxX

	SRI Funds	Euribor	LUxX
Mean	-0.0052	0.2161	-0.1522
Std. Dev.	4.7819	0.1119	7.3026
Coefficient of Variation	-923.1469	0.5179	-47.9906
Skewness	-0.9293	0.0206	-1.5434
Kurtosis	8.0334	1.9083	7.2445

Table 7.2 shows the results of four-factor of Treynor-Mazuy and Henriksson-Merton models with dummy variable. In the four-factor Teynor-Mazuy model, we find that SRI funds underperformed LUxX significantly at 1% level. This means that SRI funds performed 0.4% lower than LUxX. The α of -0.4 infers that the fund manager has poor stock selectivity skill. In terms of market sensitivity, the β_0 is significant at 1% with an estimated coefficient of 0.4224. This infers that when excess market return

increases by 1%, the excess fund return increases by 0.4%. As the market sensitivity is less than one, we can conclude that SRI funds are conservative. Our finding is consistent with Bello and Janjigian (1997). We also find that positive market timing skill exist with the estimated γ of 0.002. This infers that the SRI fund managers in Luxembourg are able to forecast the movement of stock market in general. However, there is no size effect. The large size portfolio is found to be contributed more return than the small size portfolio. Furthermore, we find value effect exists as the SRI funds is titled to the value portfolio. Nonetheless, contrarian strategy is found to add value in the portfolio return and the SRI funds produce 0.5% more in return during the financial crisis.

For robustness checking, the four-factor Henriksson-Merton model with dummy is employed for estimation. The same conclusion can be drawn from this model. In a nutshell, the fund managers are good macro forecasters in which the managers are good in predicting the general market movement. However, the fund managers are not good stock pickers. This situation happened might be due to the nature of SRI funds because the stock has to undergo the screening process before it can be included in the portfolio. Due to the limited investment opportunity after screening, the fund managers are left with limited option to forming optimal portfolio.

Table 7.2 Results of four-factor Treynor-Mazuy and Henriksson-Merton Models

Model	Four-Factor Treynor-Mazuy	Four-Factor Henriksson-Merton
α	-0.4292***	-0.4497***
β_0	0.4224***	0.3796***
γ	0.0020***	0.0487***
β_1	-0.0324***	-0.0367***
β_2	0.0700***	0.0697***
β_3	-0.0033***	-0.0031***
β_4	0.5157***	0.5079***

7.5 Conclusion

This chapter investigates the market timing skill of SRI fund managers in Luxembourg. The performance of SRI funds is lower than Euribor in term of mean returns. Moreover, SRI funds are conservative and underperformed the LUxX. Fund managers are found to possess market timing skill and able to forecast the stock market movement in general. They are able to shift the composition of funds according to market condition. On the other hand, there are no size and momentum effects but value effect exists. Nonetheless, SRI funds have higher return during the 2008 financial crisis. Hence, we suggest that the SRI funds can be used as a hedge against crisis. Our study reveals an interesting finding that market timing skill exists with poor stock selectivity skill. With the market timing skill that the fund managers possessed, they can forecast the future general market movement. Therefore, the investors will have more confident to invest in SRI funds in Luxembourg.

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Chapter 8

THE MARKET OF HIGH RISK FINANCIAL SERVICES

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THE MARKET OF HIGH RISK FINANCIAL SERVICES

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Abstract

It is really difficult to arrive at a precise definition of the term 'near bank', it is equally difficult to regulate the scope of financial services that 'near banks' render. Shadow banking, as the sector of 'near banks' is often referred to, came into play after the year 2000. In 2011, in the United States alone this sector was worth 24 trillion dollars[61], and globally it reached the value of about 60 trillion[62] dollars. Despite high level of risk related to shadow banking services offered by unsupervised and unauthorized entities, those services enjoy a considerable popularity also in Poland. Amber Gold Ltd. may be a good example of a Polish shadow financial institution which left thousands of its customers facing financial ruin. On 20th September 2012 the District Court of Gdansk declared Amber Gold's liquidation bankruptcy. By the end of September the total sum of Amber Gold investors amounted to 16,000 people, and the value of the company's due liabilities exceeded 700 million zlotys. The value of unprotected company assets, on the other hand, was on the level as low as about 50 million zlotys.

Currently, the black list of entities which do not hold a permission to render bank services, especially such as receiving money deposits in order to charge them with risk, is getting longer and longer. In the end of November the list, prepared by Polish Financial Supervision Authority (KNF) had 33 entries, which constitutes a 43% increase compared to the end of September. The reason for this may be the introduction by KNF of tightened criteria for loan availability in the form of T recommendation. Implementation of T recommendation shifted the demand for bank services towards non-bank entities.

The subject of this chapter is an analysis of the market of high risk financial services, the reasons of its fast growth as well as supervisory activities undertaken by Polish Financial Supervision Authority (KNF) related to this phenomenon.

Keywords: *shadow banking, financial pyramid, T recommendation, high risk financial services.*

8.1 Introduction

History of both saving and lending is as long as the history of humanity. The first humans already knew that they could not eat the whole food they had and they realized they needed to spare some of it for later[63]. The processes of saving and lending money constitute one of the most important financial behaviors which are closely related to certain aims and motives such as: increase of

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[62] Masters, Brook, Shadow banking surpasses pre-crisis level, *The Financial Times*, October 27th 2011, available 16.01.2012[in:] ft.com
[63] M. Pachucki, Piramidy i inne oszustwa na rynku finansowym, KNF, Warsaw 2012, p. 6.

consumption, increase of tangible assets or securing future financial stability for yourself and your close ones *(commonly referred to as saving for the rainy hour)*. These processes are determined by many factors, which in turn are affected by cultural, social and psychological influences[64]. Finally, these processes are also related to risk tolerance towards the choice of their form. Allocating your financial resources safely (*or taking out a loan or a mortgage*) requires: elementary financial knowledge, knowledge of deposit and loan products and compliance to certain rules such as choosing an offer of such a financial institution which is authorized to provide financial services. Nowadays however, customers more and more frequently turn to services from outside the regulated market, namely to 'near bank' institutions. The exclusion of 'near banks' from the necessity to comply with regulations and prudential norms facilitates their expansion in the deposit and loan sector. Not only are they serious competitors for respected banks but also they pose a threat for their customers.

Despite high level of risk related to depositing funds in shadow banking sector, 'near banks' market has been constantly growing for the last 20 years. Its current global value amounts to 60 milliard dollars (Figure 8.1). According to some sources the dynamic growth of this sector was driven, among other factors, by regulatory arbitrage[65], demand on the side of institutional cash pools[66], financial engineering[67] and development of financial intermediation[68]. In Poland, however, this market is much smaller, amounting to 2 billion zlotys in 2011.

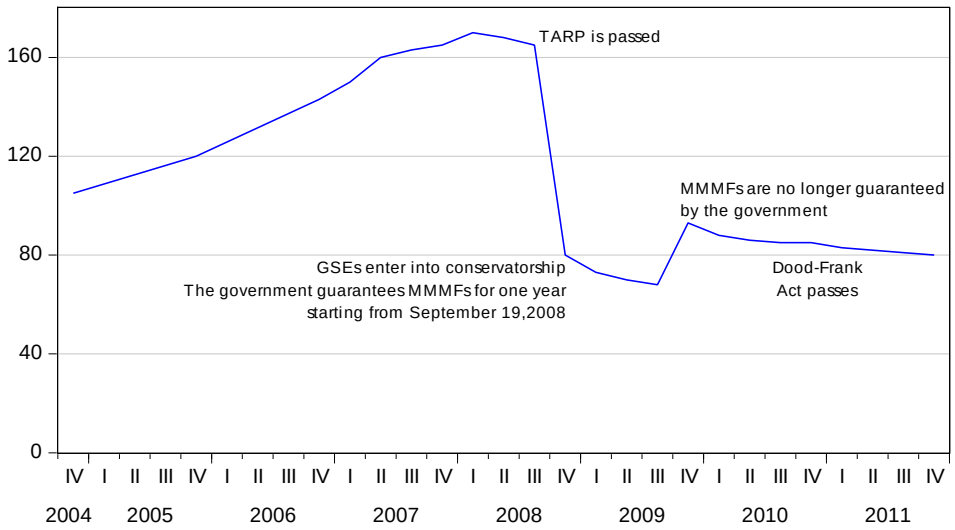

Figure 8.1 Deloitte shadow banking index for the USA, period between 2004 and 2011

Source: Report: 'The Deloitte Shadow Banking Index, Shedding Light on Banking's Shadows', Deloitte Development LLC, 2012

In the period between Q4.2004 and Q1.2008 the Index increased by 62.5%, to reach its peak value of 162.5 in Q1.2008 with the balance sum on the level of 20.73 billion dollars. During financial crisis the Index plummeted and in Q4.2011 landed on the level of 75. The value of the market fell to as low as 9.53 billion dollars, which meant a result 25% worse than in Q4.2004.

[64] Więcej w: B. Szopa, Zmiany dochodów ludności w Polsce na tle uwarunkowań systemowych, Wydawnictwo AE, Kraków 2005.
[65] S. L. Schwarcz, "Regulating Shadow Banking," Duke University School of Law, February 2012.
[66] Z. Pozsar, "Institutional Cash Pools and the Triffin Dilemma of the US Banking System," International Monetary Fund, 2011
[67] S. L. Schwarcz, "Regulating Shadow Banking," Duke University School of Law, February 2012.
[68] G, Gorton, "The Panic of 2007," Maintaining Stability in a Changing Financial System, Proceedings of the 2008 Jackson Hole Conference, Federal Reserve Bank of Kansas City

The global financial crisis and its influence on Polish financial market brought about tightening of rules concerning granting loans and mortgages. Prudential recommendations introduced by Polish Financial Supervision Authority (KNF) within its supervisory activities have double nature: T recommendations (*on good practices in risk management of retail credit exposures*) and S recommendations (*on good practices in managing credit exposures for financing real estate investments and mortgages*). These new regulations effectively limited the access to loans and mortgages and caused instant boom on services offered by 'near banks' institutions. Bank customers with bad credit standing and with no proper securities turned to parallel financial market and started to borrow money in the *shadow zone*, outside the reach of regulators and supervisors.

8.2 The notion of 'near banks' market

'*Near banks'* are most frequently defined as non-bank financial institutions operating without permission of Financial Supervisory Authority or a valid bank license but granting loans and pooling financial deposits as if they were real banks[69,70]. *Polish Financial Supervisory Authority (KNF) points to the basis of 'near* banks' activities which includes: accepting money contributions from customers and promising high interest rates and high returns from investments through making profitable but very risky deals and investments[71,72]. 'Near banks' do not need to comply with prudential regulations, capital restrictions or guarantee requirements to protect the accumulated financial resources which makes their activity extremely risky for customers. Shadow banking is also defined as a group of institutions and markets performing traditional banking functions but standing outside the system of regulated deposit institutions[73].

In literature there are also other definitions which refer to 'near banks' as financial institutions rendering services similar to bank services and acting upon specific acts[74]. A good example of such an institution is the Polish credit union SKOK - a cooperative insurance and credit intermediation company[75, 76]. Because of high demand for financial services offered by SKOK outlets, the company's market share considerably increased. Thus it became necessary to embrace it by a net of regulations to avoid the situation as in Great Britain, where competitive imbalance led to the transfer of credit demand towards unregulated loan market[77]. The supervisory changes over SKOK system are aimed at the protection of depositors[78] as well as assurance of security and stability of the company's operations.

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[69] See for example: K. Kliger, Parabanki nie zarobią na fikcyjnych kredytach, Dziennik Gazeta Prawna, 8 April 2010 (nr 68), p. 1; E. Stępień, Łatwiej będzie zaciągnąć kredyt Parabanki uzyskają dostęp do tajemnicy bankowej, Dziennik Gazeta Prawna, 2-3 May 2011 (nr 84); R. Grzyb Pożyczka na 31 tysięcy procent, Dziennik Gazeta Prawna, 6 July 2011(nr 129).

[70] L. Góral, Instytucje „parabankowe" w ustawodawstwie wybranych krajów Unii Europejskiej w Polsce, PUG 1997, nr 10, p.7.

[71] http://www.knf.gov.pl/Images/Piramidy_i_oszustwa_16_12_2011_tcm75-28815.pdf

[72] http://www.mf.gov.pl/_files_/aktualnoci/2012/sierpien/20120816_ksf.pdf

[73] B. Bernanke, Russell Sage Foundation and the Century Foundation Conference on "Rethinking Finance," New York, April 13, 2012

[74] Act of 5 December 2009 on Collective Credit Unions, Journal of Laws 2009, Nr 77, item 649.

[75] W. Szpringer, *Problem parabanków na tle pojęcia banku, jako instytucji kredytowej w Unii Europejskiej,* Prawo Bankowe 2004, nr 11, p. 49

[76] W. Szpringer, *Wpływ instytucji parabankowych na bezpieczeństwo i stabilność rynków finansowych,* Bezpieczny Bank 1998, nr 4, p. 24

[77] More in: S. Kasiewicz, L. Kurkliński (red.), Szok regulacyjny a konkurencyjność i rozwój sektora bankowego, Warszawski Instytut Bankowości, Warsaw 2012.

[78] Deposits placed in SKOK: data for the end of 2Q 2012 amounted to 15 319 864 zlotys

Extending Polish Financial Supervisory Authority's control over SKOK credit union assures its stability and the benefits coming from stable cooperative credit sector can be felt by all: for SKOK itself (*lack of disturbances in company's operations*), for members of this cooperative union (*safer financial offer*) and for the state (*SKOK plays an important role in counteracting financial exclusion*).

The advantage of state supervision relies on following aspects[79]:

- *Rule of independence (objective evaluation)* - public supervisor has no interest whatsoever to affect the image of supervised entities. In case of public supervision we can notice lack of direct relation with the supervised entity;
- *Rule of equal treatment* - each and every entity receives identical treatment and is subject to identical supervisory regulations;
- *Rule of transparency* - transparent and supervisory activities so that supervised entities could be aware of objectives of these activities;
- *Rule of formalized actions* - decisions are taken in accordance with administrative code. Supervised entities have the right to appeal from supervisory decisions;
- *Rule of proportionality* - taking into consideration the size and profile of entities operating on different markets. Unconditional application of agreed norms but recommendations and requirements of realization dependent on the scope of activity of the supervised entity;
- *Rule of collaboration* - supervisors engage in extensive collaboration with entities both while agreeing on specific activities for a single entity and while preparing guidelines and recommendations for the whole financial sector. Supervisors meet regularly with the participants of the financial market;
- *Rule of discretion and non-disclosure of information concerning the condition of a particular entity* - the supervisory body does not speak publicly about individual entities under its supervision only about the issues relating to the situation of financial sectors as a whole. The data are presented in an aggregated way and no ratings are ever prepared.

Supervisory changes also create new obligations on the part of SKOK –to name just a few:

- conducting an external audit and passing the results on to KNF (within 3 months from the date of entry into force of the act);
- updating the statutes and applying to Polish Financial Supervisory Authority (KNF) for approval of their content (within 9 months from the date of entry into force of the act);
- applying to KNF for approval of presidents of the board (within 9 months from the date of entry into force of the act);
- maintaining the capital adequacy ratio on the level of 5% (entry into force of this regulations after 18 months from passing of the act);
- obligation to keep the resources on stabilization fund and to maintain liquid reserve in the form determined by KNF.

From the author's point of view the supervisory changes should also include:

- access to the national system of guaranteed deposits, currently the deposits are insured by mutual insurance companies, however, the sum of resources is limited when compared to the system of deposit protection guaranteed by the state,

[79] K. Broda, Zasady działania nadzoru publicznego, http://www.knf.gov.pl/Images/KNF_SKOKi _13-09-2011_tcm75-27669.pdf

- verification of minimal capital adequacy ratios for SKOK, at the moment the level of this ratio equals about 3%, while the new act introduces minimum threshold at 5%. Both values are much below international standards which prescribe maintaining the capital ratio on the level of at least 8%, however the method of its calculation is different, thus there is a strong need to unify the methods,
- verification of capital sources, nowadays the only source of SKOK's capital are: net income, entry fees and shares of the union members, in order to increase the capital other sources should be considered, for example deferred shares (they can be sold but not withdrawn) and/or subordinated debt[80].

The catalogue of financial institutions offering services similar to bank services was enlarged upon the Act on Payment Services by national payment institutions and payment service centers[81]. The first one acts upon permission granted by Financial Supervision Authority (KNF), the second is registered in the records of Financial Supervision Control Office.

Regardless of definitions quoted herein, shadow banking institutions shall be treated here as business entities other than banks and SKOK outlets whose catalogue of basic activities embraces pooling money contributions from general public but with assured *provision liquidity on demand*.

The processes of deregulation, liberalization and bigger scope of activities conducted by entities led to a situation in which non-bank organizations develop and offer bank services to general public. Thus, it becomes vital to cover the shadow banking sector with an efficient network of supervision. The main objectives of the supervisory activities should be: assuring high level of security of deposited money, making sure that all activities are conducted in accordance with banking law regulations and, in case of irregularities, implementation of remedial actions.

8.3 Protection of financial resources

'Near banks' may attract customers by offering them opportunity to invest money in potentially profitable but very risky ventures. These may include investment in gold, real estate or precious metals. It should also be noted that shadow banking institutions, for some reason, are trusted and respected by a lot of people and are treated as regular public trust organizations such as real banks. Security of 'deposits' in 'near banks' is very often unjustifiably emphasized using terminology reserved for core banking activities. These activities range from pooling money contributions with liquidity on demand or after a fixed date, to granting cash loans and credits. It should also be noted here that using such wording is regulated in the Banking Law Act, article 5, item 1 on *core banking activities* and requires permission from KNF[82]. Another commonly used practice of 'near banks' aimed at increasing security of deposits is covering them by an insurance policy issued by an insurer acting upon Financial Supervision Authority's permission. Such a solution is apparently satisfying for the customer as it gives him or her an impression that his or her financial resources entrusted to 'near bank' are safe and well protected. However, provisions of most insurance policies exclude the insurer's liability in case when the entity whose customers are to be covered, conducts activities which

[80] World Bank Report Credit Unions in Poland: Diagnostic and Proposals on Regulation and Supervision, http://www.knf.gov.pl
[81] Act of 19 August 2011 on Payment Services (Journal of Laws 2011, Nr 199, item 1175.)
[82] Journal of Laws 1997 Nr 140 item 939, of 29 August 1997, Banking Law

are unlawful. It refers to situations when business activity is conducted without valid permission to, for example, render credit services or open deposit accounts. Taking into consideration all what was stated above, we can assume that the security of funds deposited in 'near banks' which remain outside any control of financial supervision bodies, is only guaranteed through mutual trust between both parties based on client-institution relation.

The fundamental difference in the level of security of funds placed in shadow banking sector and in respected banks is the guarantee of Bank Guarantee Fund. This guarantee extends the capital accumulated in clients' personal accounts and receivables resulting from other bank activities as for the day of fulfillment of guarantee conditions proved by all necessary documents issued by the bank in the client's name (art. 2 point 2)[83].

The provisions of Bank Guarantee Fund Act assure the return of all capital together with interest rate earned up to the value of 100,000 Euro within 20 working days. This regulation applies also to the capital accumulated in joint accounts by each of the co-holders of this account[84]. The compensation rule does not apply here, which means that the customer is paid all accumulated funds up to the guaranteed limit without diminishing them by the value of credits contracted in a given bank. The time of payment of guaranteed funds is determined after guarantee condition is fulfilled (art. 26g, paragraph 1, point1. of Bank Guarantee Fund Act) according to the art. 2 point 4a of the Act i.e. upon issue of Financial Supervision Authority (KNF) decision on suspending bank operations and setting up litigation trust and upon application for commencing bankruptcy proceedings to the court of local jurisdiction[85].

The deposit guarantee schemes constitute an important instrument safeguarding financial system against crisis situations (for instance announcing bank bankruptcy or mass deposit pay-outs) and loss of trust. It takes on a new meaning with respect to deposit market which is an important source financing credit institutions, and in social aspect-ensuring financial security of individual and corporate customers. For this reason the guidelines for EU deposit guarantee schemes were unified (*directive 2009/14/EC of 11 March 2009 amending Directive 94/19/EC on deposit-guarantee schemes)*. The coverage level was raised to 100,000 euro, the provision on own contribution of depositors was deleted, the time of pay out of deposits was shortened to 20 days, and the group of entities covered by the guarantees was extended. The practice of raising the guarantees of deposit protection by some member states was thus stopped what resulted in reduction in the number of deposits in countries with lower guarantee requirements. The regulatory and supervisory activities over bank system are aimed at limiting excessive competitive practices (*for example moral hazard*) between banks. The victim of such practices would, of course, be customers. Another goal here is protection of 'weaker entities' – the service buyers against putting on them the risk related to financial operations[86].

Since the introduction of Bank Guarantee Fund Act in 1995, the Fund has accomplished guarantees for depositors of 94 banks in bankruptcy (5 commercial banks and 89 cooperative banks). Made by BGF payments of guarantees represented 814.4 million zlotys and accounted for almost 319

[83] Journal of Laws 2009 no 84 item 711, Text valid from 14 July 2011
[84] Journal of Laws 2010 Nr 257,item 1724
[85] Journal of laws 2009 no 84 poz. 711, Text valid from 14 July 2011
[86] R. Kaszubski, A.Tupaj-Cholewa, Prawo bankowe, Warsaw 2010, p. 166.

thousand of authorized depositors[87]. The number of banks in bankruptcy between 1992-2011 shows Table 8.1.

Table 8.1 Number of banks in bankruptcy between 1992-2011

Year	Commercial banks	Cooperative banks
1992	0	1
1993	0	10
1994	0	23
1995 before BGF Regulation	1	9
1995 after BGF Regulation	2	48
1996	1	30
1997	0	6
1998	0	4
1999	1	0
2000	1	0
2001	0	1
2002 -2011	0	0
Total:	**6**	**132**

Source: http://www.bfg.pl

SKOK Credit Union owns savings protection system set up as supervisory activities carried out by Safe National. The objective of Safe National activity is to ensure the financial stability of all the associated cash departments and supervise their activity in order to guarantee security of the accumulated savings. It also monitors compatibility of SKOK activity with Act Regulations. In order to reach this objective Savings Protection Scheme has been formulated which secures the savings of SKOK members up to 100,000 Euros. Moreover, SKOK Credit Unions are obliged to keep in Safe National the stabilization fund consisting of deposits made by affiliated safes representing at least 1 % in value of all the assets and increased by balance surplus of Safe National[88]. The stabilization fund according to Safe National's statute can be allocated to stabilization loans that are granted to SKOK Credit Unions on preferential terms, providing safes with grants to cover their financial issues and offer other assistance for example covering the costs of preparation and realisation of recovery programs. None of "shadow zone" institutions guarantees such level of security; the example is bankruptcy of Secure Safe Savings (BKO) functioning between 1989-1990. As a result of this activity the trustee paid to the clients only 1/4 of the amount invested. Shadow banking institutions cannot offer attractive high interest rate investments or guarantee return on capital with interest earned. However using loopholes they can offer *'deposit contracts'* which are a type of civil contract similar to a private loan. The mentioned contracts 'work' in the same way as deposits however they are not called "deposits". These investments can be misleading for customers, and wrongly mistaken for secure deposits that banks offer. The investment is not regarded as a deposit according to the banking law, and "shadow banking" is not covered by national guarantee money return. Additionally,

[87] http://www.bfg.pl

[88] Value of stabilisation fund on 31th December 2010 was equal to 425,907,923.52 zlotys. Out of the fund in 2010 there were stabilisation credits granted in the total amount of 20,030,126.00 zlotys, and total involvement in stabilisation service was equal to 70,930,311.86 zlotys, www.skok.pl

money allocation can be very risky which means the possibility of losing the part of it or even the whole of invested capital by the depositor.

The employment of deposit contracts by near banks does not conflict with Bank Law Acts, due to lack of regulations that would forbid the public to lend money to companies particularly whose that do not have any guarantees of Bank Guarantee Fund. The future of entrusted money depends on near banks activities and market fluctuations. It is worth mentioning that if the entity receives funds for deposits or deposit contract, which poses risk on them, the bank requires obtaining permission for banking activity from Polish Financial Supervision Authority. Otherwise the regulations of criminal liability are employed The Banking Act 1 Article 171.*'Whoever carries out, without authorization, the business of accepting funds from other natural or legal persons or organizations without legal personality in order to extend loans or cash advances or expose such funds to risk in another way shall be liable to a fine of up to 5.000,000 zlotys and to imprisonment for a term of up to 3 years'*[89].

The fact of lending money to institutions (including near banks) by the public is questionable as well as the way of allocating funds by businesses. Near banks within their basic activity not only invest in precious metals, foreign exchange or real estate but also grant cash loans and consolidated loans to their customers. Here we can talk about some discrepancies with *Banking Law* Regulations.

Summing up, the high risk of 'shadow banking system' activity is mostly connected with shortage of law regulation concerning financial supervision, often lack of current financial reports and guarantee scheme, finally insufficient capital to the scale of business operations.

8.4 'Loans' costs offered by ‘near banks’

Near banks' flexible approach to the customers as well as attractive offers with much higher deposit interest compared to other banks, attract attention to this form of banking. There is a dynamic increase observed not only in the number of shadow banking institutions but also in the number of people using shadow banking offers. In Profi Credit Poland, company limited by guarantee, the number of granted loans and credits rose in a third quarter of 2011 from 16,876 thousand to 26,276 thousand in a third quarter of 2012 which indicates percentage increase of 156%. Value at par of granted credits and loans increased by about 164% in that time[90].

According to Polish Financial Supervision Authority report, there are 33 companies on Polish market that conduct banking activities without permission for accepting deposits and risk exposure (including Amber Gold and FinRoyal FRL Ltd , both declared bankruptcy). The businesses employ the latest ways of reducing the distance between business - customer, for example by granting loans by phone or via Internet. To use such business services generally the customer's registration on the banking site is necessary as well as transfer from customer's bank in order to confirm the identity. Other loan activities such as amount of loan are set by phone, text massage or web site. Positive lender's acceptance is demonstrated by the funds transfer to the appointed during registration bank account.

Despite using cheap and common communication channels (text message, phone, Internet), incurred costs of shadow banking institutions loans are fairly high. Though interest does not exceed

[89] Act of 29 August 1997 Bank Law, Journal of Laws. year 1997 , No 140, item. 939.
[90] http://profirealgroup.com/images/Financni_zpravy/EN/credit_pl/2012/Raport%20kwartalny%20na%2030%20wrzesie%202012.pdf

27 percent that is quadruple of lombard rate of Polish National Bank (6.75 %[91]), which is the result of limitation imposed by anti-usury act; the total loan cost consists of arrangement fee, non- refundable in case of loan refusal, fee for home customer service, commissions and premium. Frequently, the total loan cost in near bank is increased by additional costs resulting from excessive insurance *(for example, promissory note, mortgage, the cost of credit check in National Debt register).*As a result, Annual percentage rate (RRSO) of granted loan exceeds value of 20000% (*EkspresKasa - 23000%, Kasomat - 819%, SMS365 - 8348%*)[92], which is presented in Table 8.2. High total costs of granted by near banks loans do not have a negative influence on number of potential customers.

Table 8.2 Part of annual percentage rate (RRSO) of cash loan in Kasomat.pl Company (Rate as at 2012-09-13)

Annual percentage rate (RRSO)	100.00 zł	110.00 zł	120.00 zł	130.00 zł	140.00 zł	150.00 zł	160.00 zł	170.00 zł	180.00 zł	190.00 zł	200.00 zł
1 day	4944.41	4813.65	4854.15	4888.67	4918.45	4824.42	4854.15	41311.99	4904.09	4830.66	4854.15
2 days	4752.92	4792.48	4752.92	4786.38	4752.92	4781.90	4752.92	13811.61	4752.92	4775.78	4752.92
3 days	4683.23	4667.88	4655.12	4687.57	4675.18	4664.47	4655.12	9442.46	4670.72	4662.50	4655.12
4 days	4560.61	4560.61	4560.61	4560.61	4560.61	4560.61	4560.61	7726.02	4583.32	4582.12	4581.05
5 days	4485.09	4490.87	4469.24	4475.33	4480.56	4485.09	4489.07	6767.05	4478.04	4481.75	4485.09
6 days	4380.86	4392.51	4402.25	4390.72	4399.19	4389.40	4396.89	6175.93	4395.11	4387.60	4393.68
7 days	4306.01	4300.19	4313.14	4307.66	4302.96	4313.14	4308.68	5754.16	4301.27	4309.39	4306.01
8 days	4230.72	4229.07	4227.69	4226.53	4225.53	4224.66	4223.90	5431.47	4222.64	4222.11	4221.63
9 days	4140.24	4143.09	4145.47	4147.48	4138.00	4140.24	4142.20	5172.01	4145.47	4146.85	4140.24
10 days	4068.48	4060.99	4066.19	4060.03	4064.56	4068.48	4063.33	4955.62	4062.38	4065.59	4068.48
11 days	3985.58	3993.30	3989.62	3986.51	3992.51	3989.62	3987.09	4770.07	3989.62	3987.49	3991.64
12 days	3917.39	3916.41	3915.59	3914.89	3914.30	3913.78	3913.33	4607.50	3918.59	3917.96	3917.39
13 days	3840.70	3842.47	3843.94	3845.19	3846.25	3847.18	3847.99	4456.09	3843.94	3844.79	3845.56
14 days	3776.01	3779.21	3774.55	3777.37	3773.51	3776.01	3778.21	4325.98	3776.99	3778.79	3776.01
15 days	3712.63	3709.72	3707.31	3711.40	3709.21	3707.31	3710.63	4207.13	3711.74	3710.11	3708.64
16 days	3643.32	3642.65	3642.10	3647.24	3646.44	3645.74	3645.14	4097.61	3644.13	3643.70	3643.32
17 days	3583.30	3583.91	3584.41	3579.70	3580.44	3581.07	3581.63	3995.94	3582.56	3582.95	3583.30
18 days	3518.48	3520.71	3522.58	3519.42	3521.11	3522.58	3520.01	3900.97	3519.16	3520.42	3521.55
19 days	3461.63	3459.56	3462.57	3460.75	3463.25	3461.63	3460.21	3811.81	3461.00	3459.83	3461.63
20 days	3406.08	3405.12	3404.32	3403.65	3403.07	3402.57	3402.13	3727.74	3404.32	3403.86	3403.45

Source: https://www.kasomat.pl

According to Credit Information Bureau data, fall in the number of granted by banks installment credits and cash loans have been observed. In the first half of 2012 banks granted just 2 million 972 thousand of installment credits and cash loans which shows the worse result compared to the same time period in 2011 by 17%. This situation means that there is a group of people financially excluded by banks and reinforcing concurrent shadow banking market. This view is supported by Credit Information Bureau estimates based on a number of granted by banks loans - about 80 thousand per month.

[91] valid from 10 May 2012
[92] Data obtained from web page information site

8.5 The customer and financial services market

According to Credit Information Bureau data there is a dynamic increase in the number of people applying for credits yet financially excluded by other banks. It creates conditions for the development of the concurrent financial market. However this market lacks significantly customers' trust. With the reference to CBOS survey (Public Opinion Research Centre) researching functioning of this market, 73% of the respondents showed distrust towards shadow banking institutions, with 12% of the respondents presenting moderate level of distrust. The results indicate that over 85% of questioned individuals demonstrate limited trust towards near banks. Only 4% of the viewers declared confidence towards shadow banking institutions irrespective of lack of safety guarantee on deposits made[93].

These results were confirmed by TNS OBOB survey where 75% of the respondents showed no interest in near bank's loan and only 3% of the people had opposite opinion. It should be mentioned that over 22% of the surveyed subjects had no opinion regarding this issue (Figure 8.2)[94].

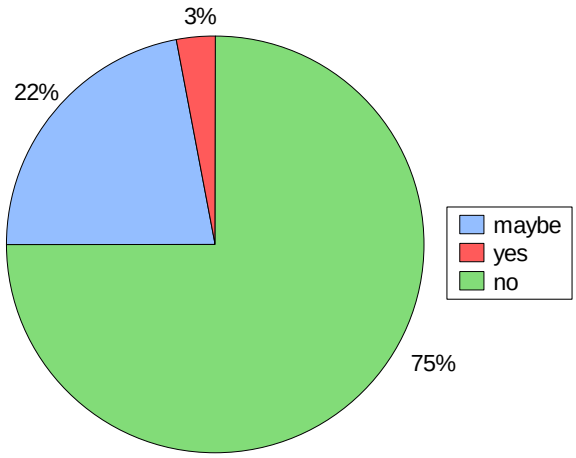

Figure 8.2 Respondents' interest in near bank's loan

Source: data from „Konsument na rynku usług finansowych", Raport TNS Poland for UOKiK (Office of Competition and Consumer Protection) August 2012

The respondents who showed interest in having a loan were representatives of people with vocational education (5% of the respondents) and people in poor financial situation, with monthly income between 1501-2500 zlotys. The similar customer profile was created with the CBOS survey[95]. The respondents' age was irrelevant to the results relating to trust in shadow banking market. Among people up to 24 years of age, and people living in agglomerations of population between 20 and 100 thousand and over 500 thousand only 6% of the respondents showed trust which is consistent with the results of TNS Poland survey.

The confidence analysis to shadow banking is concluded by presentation of the results according to professional groups. It shows that the greatest trust is declared by self-employed people (about 10% of the respondents) followed by administrative and clerical staff (9% of the respondents) and unemployed (7% of the respondents).

[93] Survey conducted by CBOS „Aktualne problemy i wydarzenia", August 2012.
[94] Survey conducted by CBOS . „Aktualne problemy i wydarzenia", August 2012.
[95] „Konsument na rynku usług finansowych", Raport TNS Polska for UOKiK, August 2012

TNS Poland survey indicated respondents' main interest reasons in having a bank loan. 36% of the respondents pointed out to the possibility of obtaining credit rating faster compared to other banks, 16% of the surveyed subjects specified lack of fixed income or illegal work, bank credit refusal due to low income was mentioned by 12% of the respondents ,and 8% of people listed former debts as reasons.

It was also confirmed that society presents poor knowledge regarding future of deposited funds in case of bank bankruptcy. Half of the respondents were not able to provide an answer, 7% of people claimed that deposits with earned interest would be paid by Banking Guarantee Fund, 4% of subjects believed they would recover funds without interest. Only 39% of the respondents provided the right answer. The last group was represented by individuals between 40-49 years of age (47%), people with higher education (53%) and active population (46%).

8.6 Summary

Summing up it should be mentioned that the shadow banking system has indicated the need for modification of Polish banking system and sealing Polish Law regulations. In case of banking system excessive security measures for example S and T recommendations created space for near banks activities. The modification of Law system is connected with removal of loopholes in the control area (*range of activities*), competence area (*appointment of authorities responsible for this part of financial market*) and organizational (*effective supervision*)[96]. Particularly, the last area requires immediate changes, lack of possible interference of Polish Financial Supervision Authority in relation to shadow banking system supports this point.

Polish Law and European Union Law harmonization leads to integrated supervision of all the institutions that have repayable funds assigned. This fact obliges all near banks [97] to obtain permissions for their activity. Such course of action not only influences public safety improvement and the savings but also the whole financial system. Due to recent events concerning Amber Gold, company limited by guarantee, creating supervisory body seems necessary. However it is essential to develop uniform and detailed regulations concerning 'near banks' range of authorizations or type of offered instruments. This course of action corresponds with European Union Policy and actual integration of financial market.

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IV.

Eurozone Perspectives

Chapter 9

THE CRISIS OF EURO'S GOVERNANCE: INSTITUTIONAL ASPECTS AND POLICY ISSUES

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THE CRISIS OF EURO'S GOVERNANCE: INSTITUTIONAL ASPECTS AND POLICY ISSUES

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Abstract

The European Monetary Union is characterized by a crisis of governance, this has become more evident with the crisis of the euro which has shown the weaknesses of the European institutions and stressed the heterogeneity of member countries.

The global financial crisis struck the euro area very severely because it coincided with the lack of appropriate policy tools to handle it and with a period of weak political leadership which have made crisis management even harder. Europe needs to build the institutions of its monetary union to avoid similar crises in the future. But it is necessary a greater European integration, with a central fiscal entity at European level which requires a transfer of sovereignty from the individual Member States. This contribution first discusses the issue concerning rules and discretion in the governance of the euro. In the following section it describes the euro crisis and examines the remedies put in place, noting that despite the statements and the efforts of the European authorities the confidence in the euro is diminishing. Thus the exit of Greece from the euro or even the breakdown of the single currency has become a hypothesis discussed more frequently among economists, politicians, central bankers and businessmen. The last section of the chapter focuses on what's wrong in the governance of the euro and examines the institutional aspects and the economic policy issues suggesting that the European integration allows to ensure the European citizens independence and protect their historical freedom, but also to influence and thus affect the choices from which may depend the future prosperity of European nations involved.

Keywords: Euro, crisis of governance, European integration, European institutions, economic policies.

9.1 Introduction

The European Monetary Union is characterized by a crisis of governance, this has become more evident with the crisis of the euro which has shown the weaknesses of the European institutions and stressed the heterogeneity of member countries; heterogeneity - according to Martin Feldstein (2011) - that includes not only economic structures but also fiscal traditions and social attitudes.

The members of the European Monetary Union are independent states which have given up their own currencies in favor of a joint currency, the euro. Stability of the euro can be assured if the economies of the member states tend to be similar in competitiveness, economic growth and fiscal policies. Otherwise imbalances between these countries tend to occur, create tensions in the currency area and, in the end, endanger the currency union, as Mundell (1961) had already maintained. In any case, since its inception the European Monetary Union has shown a preference for a political approach to decisions to admit a country as a member of the euro area instead of looking exclusively to its economic fundamentals.

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Undoubtedly, the global financial crisis struck the euro area severely because it coincided with the lack of appropriate policy tools to manage the crisis and with a period of weak political leadership which have made crisis management even harder.

Barry Eichengreen (2009) has correctly underlined the need for Europe to build out the institutions of its monetary union that can avoid similar crises in the future, because the economic governance of the European Monetary Union has remained incomplete and weak.

But apart from building the appropriate institutions and complete the architecture of the system, it is necessary a greater European integration, which inevitably has a political character. However, the European integration serves to ensure the European citizens - at a time when only the giants make the law and have political power and wealth - that they can enjoy independence and protect their historical freedom, but also to influence and thus affect the choices from which may the future prosperity of European nations involved may be dependent.

This contribution first discusses the issue concerning rules and discretion in the governance of the euro. In the following section it describes the euro crisis and examines the remedies put in place, noting that despite the statements and the efforts of the European authorities the confidence in the euro is diminishing. Thus the exit of Greece from the euro or even the breakdown of the single currency has become a hypothesis discussed more frequently among economists, politicians, central bankers and businessmen. The last section of the work focuses on what's wrong in the governance of the euro and examines the institutional aspects and the changes required and the economic policy issues. All proposals require a stronger European political integration, in which the European institutions are able to implement the economic policy for the entire euro area.

9.2 Rules and discretion in the governance of the Euro

The governance of the euro has been characterized by the centralization of monetary policy and by decentralization of fiscal policy. The advent of the single currency has involved the transfer of monetary sovereignty to the European Central Bank (ECB). The ECB has in any case a limited liability and a very narrow remit, which is to look after the stability of the euro. In order to fulfill the maintenance of stability of prices, the Maastricht Treaty, signed in 1992, has given to the ECB a complete institutional independence[99]. This institutional independence is, according to mainstream economic theory (e.g. Barro and Gordon, 1983), a prerequisite to ensure the credibility of monetary policy.

Thus the peculiar feature of the setting of the European Monetary Union is that in the face of a single monetary policy, which is established at the level of the euro area as a whole, the fiscal policy remains under the direct responsibility of individual member states and is, therefore, inevitably fragmented. In fact, the EMU has followed an original design: it has a common currency, the euro, but does not have a federal budget and a major form of integrated financial supervision. This because the Maastricht Treaty has embodied a conscious political choice not to create a fully-fledged economic union to accompany monetary union, thus creating a fundamental asymmetry in the institutional structure (Schilirò, 2006). For this Eichengreen and von Hagen (1996) argued that EMU is an incomplete system, as it is based on a monetary union without fiscal union.

[99] The independence of ECB derives from Art. 282 of the EU Treaty.

It is well known that due to strong economic heterogeneity among member states of the European Monetary Union being formed, the Maastricht Treaty made the participation of a country into the European Monetary Union to a sufficient degree of convergence, compared to other countries, of certain financial and fiscal criteria. Actually the Maastricht criteria constrained governments in few aspects of heterogeneity only. More specifically, the sovereign debt of a country should not be more than 60 percent of its GDP and the annual increase in debt should not exceed 3 percent of GDP. In addition, the inflation rate should not be higher than that of the three most stable countries by more than 1.5 percent, the yield to maturity of long term-government bonds should not exceed that of the three most stable countries by more than 2 percent and the country should have been a member of the European Currency System for at least two years without devaluation of its currency. Of course, the creation of the single currency has led to the loss of exchange rate flexibility.

Another essential rule of this institutional setting was the no-bailout clause, so that a member state in heavy financial difficulty or with liquidity problems could not be helped by other member states or by the European Central Bank. This no-bailout clause, which precludes the sharing of liability for government debt across Member States, has been codified in Art. 125 of the Treaty on the functioning of the European Union (TFEU)[100] and by Art. 104, which rules out that national central banks or the ECB provide direct credit to public authorities, defined in a comprehensive sense. Once a country has joined the EMU, the two essential criteria became the 3 percent criterion regarding the deficit and the sovereign debt criterion[101]. Furthermore, to establish specific constraints to individual member states and precise rules that restrict the actions of the national governments in addition to the fiscal criteria of the Maastricht Treaty, it was introduced the Stability and Growth Pact[102], which would have further limited the discretionary action of the member states of European Monetary Union. But in the subsequent revision of the Pact in 2005 the strictness of the 3% limit and the time frame for correcting excessive deficits were relaxed, while procedural deadlines were extended (Schilirò, 2006). This revision of the Pact has shown the operative difficulties to reconcile strict and flexible rules.

Yet, the European monitoring mechanism focused itself exclusively on sovereign indebtedness, whereas other warning signals like wage increases, international competitiveness, etc. were ignored. This was probably due to the prevailing conviction that the convergence between national economies would be enforced by the market mechanism and by European directives which then would homogenize laws of the member states.

The theoretical foundations that have justified the presence of specific criteria of fiscal discipline in the design of the EMU are not strictly related to the theoretical paradigm of optimum currency areas (Mundell, 1961). An important aspect concerns the fact that the existence of independent monetary policy authority from political power is a necessary and sufficient condition to ensure stable prices, but that this condition is actually strictly related to the behavior of fiscal

[100] However, Art. 122 provides an exception to this clause. When a member state is in difficulties or is seriously threatened by natural disasters or exceptional occurrences beyond its control, on a proposal from the Commission, the Council of the Heads of the national governments may grant financial assistance to the member state under certain conditions. This clause is a way to make enter the political discretion in a crisis resolution.

[101] If new debt is likely to exceed 3 percent of GDP, then the European Commission issues an early warning. If it actually exceeds 3 percent, then the Commission starts a deficit procedure. (For more details see Schilirò, 2006).

[102] The Pact was established by the Resolution of the European Council held in Amsterdam on 17 June 1997. Later in the EU Council in Brussels on 22 and 23 March 2005 the Stability and Growth Pact was amended (Schilirò, 2006).

authorities. Thus, to avoid problems of fiscal dominance or avoid adverse effects on the price level of potentially expansive fiscal policy is necessary to introduce a discipline with strong ties in the conduct of fiscal policy (Schilirò, 2006, 2011). Another aspect, already highlighted by Tabellini and Alesina (1990), concerns the opportunistic behavior of democratic governments elected in office that, following fiscal policies inconsistent and shortsighted, might prefer to leave excessive deficit to potential successors who will come to power, thus creating imbalances in debt policies among member countries of the EMU. Such opportunistic behavior makes it hard for the ECB to ensure stability. The Stability and Growth Pact has been designed just to ensure a supranational budgetary discipline, and that short-sighted and opportunistic behaviors of the member States should be avoided or otherwise sanctioned. On the other side, Krogstrup and Wyplosz (2010) pointed out that although theoretically supra-national rules are welfare improving relative to merely national regimes, they cannot fully eliminate the deficit bias, which calls for strong national rules in addition to the supra-national ones. Yet the literature argues that the effectiveness of fiscal rules with respect to fiscal performance is not assured (von Hagen and Eichengreen, 1996). Some authors have shown that such effectiveness depend on the mechanisms established to enforce conformity with the rule and on the type of rule. Others, in particular Buti *et al.* (2007), have shown fiscal rules to be effective, but also to lead to significant creative accounting aimed at their circumvention.

Regarding the sanctions in case of violation of the debt criteria, the implicit assumption of the Maastricht Treaty appears to be that the sanctions are sufficient to force states back on a trajectory satisfying the Maastricht criteria, although there was a weak enforcement mechanism, even in the Stability and Growth Pact[103]. The weakness of the Pact was due, however, to its weak enforcement provisions (ECB, 2008). Just consider that the provision of a qualified majority was required in the ECOFIN Council in order to approve further procedural steps. So countries with excessive deficits retained the right to vote and needed only a few additional countries - prospective deficit countries among them - to block such steps.

In a monetary union such the EMU is obvious that coordination problems arise among member states, since these member States are independent states that must decide about their wage and labor market policy, their industrial policy, the monitoring of their banking system, etc. The coordination is doomed to be ineffective if there are conflicts of interest among the States, thus leading to imperfections in internal coordination. Actually, the institutional framework of the EMU is based on decentralized policymaking, soft coordination and an insufficiently stringent enforcement of common rules. So the institutional framework established in the European monetary union has given the national policy a wide range of discretion, despite the Maastricht criteria and the Stability and Growth Pact. For instance, wage and price increases can be much higher in one state relative to the others. Another case is that a State may run a strong currency account deficit. Furthermore, the issue of monitoring by capital markets is never mentioned in the Maastricht Treaty. Therefore, if a State has a bad debt rating, no political action needs to be taken. Lastly, the issue of financial stability was not included in the governance of the euro, while all the emphasis has been placed by the ECB with regard to price stability.

[103] The 2005 reform of the Stability and Growth Pact has increased the degree of discretion of the national governments of the euro members, since it implicitly accepted to tolerate possible fiscal deficits systematically higher in all countries of the euro area, but it also undermined the role of institutions.

9.3 The crisis of the Euro and the remedies put in place

In 2007, when the global financial crisis broke, the European Monetary Union had already deprived member governments of the monetary and exchange-rate instruments of macroeconomic management and, through the Stability Pact, it also tried to constrain the adoption of fiscal instruments. But since the euro area was not an optimal currency area, the imposition of one-size-fits-all ECB interest rates produced asymmetric impulses in EMU economies, with effects above- average or below-average in terms of rates of growth and inflation. In particular, the economies of the "GIPS" (Greece, Ireland, Portugal and Spain), taking advantage of very low real interest rates, have spent and lived beyond their means by accumulating private and/or public debt and running large current account deficits. In fact they have relied on state spending to drive growth, so they have recorded high deficit/GDP ratio and rising public debt, in addition "GIPS" countries have fueled credit-financed economic growth and employment, but also rapid increases in unit labor costs that reduced export competitiveness (Baldwin *et al*., 2010; Schilirò, 2011). The resulting rise of current-account deficits was accommodated by equally rising capital inflows from investors in surplus economies leading to rising external debts accumulated primarily in the private sector. As a consequence, the economies of the "GIPS" were becoming extremely vulnerable to potential disturbances in international financial markets that might induce capital flight - followed by potential liquidity and solvency crises.

This has created deep concerns about the fiscal sustainability and the credibility of whole euro area, especially because the GDP in the euro area has been growing much less than budget deficit and public debt, in fact over 2011, GDP increased only by 1.4 per cent.

Table 9.1 shows that the average value of deficit/GDP ratio for the whole Eurozone was 6.0 per cent in 2010 double than the 3 per cent fixed in the Maastricht Treaty, whereas the average value of debt/GDP was 86.1 per cent, much higher than the 60 per cent benchmark.

In particular, Greece has accumulated a huge sovereign debt, mainly due to public finance mismanagement[104], so that its financial exposition prevented the Greek government to find capital in the financial markets, therefore Greece has become at risk of sovereign default. Also Ireland has become at risk because of the large private debt due to the mismanagement of its banks, thus the country cannot find finance in the markets. Portugal was the third country of the euro area with an high deficit, for whom the access to liquidity in financial markets was denied. These countries were forced to seek financial support. Lastly, Spain (like Ireland) is now suffering the most serious recession, since its real estate bubble is deflating with the related problems that ramify through the financial systems, while its budget deficit has greatly worsened. In this situation international capital markets reacted by demanding higher risk premiums for continuing holding public debt of "GIPS", but also of Italy, so the bond spreads have shot up.

Growing current account imbalances were recorded between the countries of North and South of the euro area over time (Holinski *et al.* 2010). The crisis, actually, has exposed flaws in the peer review process which put disproportionate emphasis on fiscal discipline at the expense of equally relevant criteria such as current account deficits.

[104] Greece has reported incorrectly the data on government finances, which have aggravated concerns.

The problem of current account imbalances between the "GIIPS" (Greece, Ireland, Italy, Portugal and Spain), that is the countries with strong deficit of current accounts, on one side and Germany and other surplus countries, on the other, has been recently stressed and criticized by Werner-Sinn and Wollmershaeuser (2011)[105].

Table 9.1 Government balance and debt in euro area countries in 2010

	Deficit/GDP	Debt/GDP
Belgium	-4.1	96.8
Germany	-3.4	83.2
Ireland	-32.4	96.2
Greece	-10.5	142.8
Spain	-9.2	60.1
France	-7.0	81.7
Italy	-4.6	119.0
Luxembourg	-1.7	18.4
Netherlands	-5.4	62.7
Austria	-4.6	72.3
Portugal	-9.1	93.0
Finland	-2.5	48.4
Euro area	-6.0	86.1

Source: Eurostat (2011)

The debt crisis of the euro area has highlighted that the euro system lacks the mechanism to resolve the crisis. In addition, the crisis has led to a more robust pursuit of the national interest, which usually comes to the fore in times of crisis. At the same time the bail-out clause (Art. 125 TFEU), devised to instill market discipline on policymakers through differentiated risk assessment in sovereign debt markets, proved to be ineffective and far from reality since the countries, although opposed to the bailouts, have been forced by events to accomplish them. But the debt crisis has also pointed out, according to Paul De Grauwe, that "there is no mechanism to ensure convergence of members' competitive positions and thus to prevent major trade imbalance. This stems from the fact that economic policies (spending and taxation, social policies, wage policies, etc.) remain firmly in the hands of the member governments and members do not coordinate such policies". Moreover, "there is no mechanism to resolve crises caused by these imbalances and divergent competitive positions. Consequently, Eurozone crisis management is ad hoc, time-consuming, and hindered by a lack of credibility." (De Grauwe, 2010).

The crisis of the euro also showed the weaknesses of the banking system in the euro area. The banks demonstrated not to be strong enough, but they are at the same time interconnected with the sovereign debts. The fragility of banks and its interconnectedness with the debt crisis created severe macroeconomic problems, and also the risk of failure of banks in several countries of the euro area. Thus a pressing need has become to ensure the euro area a unique system of banking supervision and coordination[106]. In short, the governance of the euro area revealed the lack of a coordinated banking policy, which is crucial for crisis management.

[105] They argue that ECB and the European System of Central Banks has played a huge and improper role as lender of last resort to the banks of the euro area, in particular those of the countries with a current account deficits, since the crisis in the euro area has become above all a balance of payments crisis.

[106] A first step, but still insufficient, was the creation of the European Banking Authority (EBA) by the European Parliament and the Council of 24 November 2010.

In order to establish a new institutional framework to manage the crisis of the "GIIPS" but also and more generally the crisis of the euro, the European institutions have taken several decisions during 2010 and 2011. First, in Spring 2010, the EU together with the IMF have decided a program of financial aids to help Greece since the country was on the verge of insolvency. To overcome the no bail-out clause the European Council approved the financial aids in the form of "coordinated bilateral loans" at non-discounted interest rates[107].

Second, ECB adopted an important measure, called "securities market programme" (SMP) by which ECB decided to buy government debt of fiscally challenged countries; in this way the ECB purchases government bonds, in secondary markets, in order to provide liquidity to alleviate pressures from sovereign debt risk [108]. Also the member banks of the European System of Central Banks started buying government debt. This measure aimed at improving liquidity, reducing volatility in the financial markets so to reduce the spreads on the sovereign bonds[109]. The SMP was mainly active during 2 periods. The first started after the ECB Governing Council meeting on May 14, 2010 and lasted until the week of July 9, 2010. The second period began the week of August 15, 2011 and at the end of 2011 was still underway.

Third, another very important decision to shape a new institutional framework to manage the crises was taken on May 9, 2010 when the 27 Member States of European Union agreed to create a comprehensive rescue package, a legal instrument aimed at ensuring financial stability in Europe: the European Financial Stability Facility (EFSF), a Luxembourg-registered company owned by Euro Area Member States, that has become operative in August 2010 and started to give credits to countries in financial difficulties[110]. But EFSF can also intervene in the debt primary and secondary markets; in particular, the intervention in the secondary market will be only on the basis of an ECB analysis recognizing the existence of exceptional financial market circumstances and risks to financial stability. The ESFF is devised in the form of a special purpose vehicle that will sell bonds and use the money it raises to make loans to Eurozone nations in need. In practice the EFSF may issue bonds or other debt on the market in order to accumulate funds with whom to lend to Eurozone countries in economic difficulties, recapitalizing banks, or buying government bonds. EFSF is backed by guarantee commitments from the euro area Member States (in proportion to their paid-in capital to the European Central Bank) for a total of €780 billion and has a lending capacity of €440 billion[111]. The bonds also will be backed by guarantees given by the European Commission representing the whole EU and the IMF (that can provide loans up to a maximum of €250 billion). The EFSF will sell debt only after an aid

[107] Actually the interest rate paid on the loans to Greece (loans approved by the European Council in April 2010) by the Members States was 5 per cent, lower than the 7 per cent demanded by the markets.

[108] To sterilize this move the ECB conducts liquidity absorbing operations of the same magnitude. In fact, the ECB is buying risky assets issued by a fiscally troubled government of the Eurozone and, via its sterilization operations, selling its claims on banks, which is equivalent of selling new assets, a move that has been viewed by some economists and financial analysts as an improper risk transfer.

[109] The creation of the SMP was closely related to the Greek debt crisis, but then it was helpful for sovereign debts of Spain and Italy.

[110] The EFSF has been used to help the governments of Greece, Ireland and Portugal. The Fund bases its rules of the crisis management regime on the principles and procedures of the "IMF doctrine". The EFSF operates in case of unattainable fiscal policies and sovereign debt crises.

[111] EFSF has been assigned the best possible credit rating by Moody's (Aaa) and Fitch Ratings (AAA). EFSF has been assigned a AA+ rating by Standard & Poor's. The capacity of EFSF of achieving these "good" ratings depends on *overcollateralization* (that is by a shared assumption about the distribution of possible outcomes), which takes the form of guarantees by other Eurozone countries. However, only France and Germany have a rating of AAA.

request is made by a country. In 2011 the EFSF issued securities for about €18.0 billion and granted loans to Ireland and Portugal, respectively, for €7.6 and € 6.9 billion. The EFSF has also issued € 35 billion of bonds for the activation of the scheme repurchase designed to support the quality of securities issued or fully guaranteed from Greece. The EFSF is tasked to provide emergency financing until 2013 (Schilirò, 2011). At the same in 2013 it should become operative the European Stability Mechanism (ESM) a permanent organization that will provide financial assistance to members of the euro area in financial difficulty, replacing the existing temporary funding programmes such as EFSF and EFSM (the European Financial Stabilization Mechanism). The agreement reached by the leaders of the euro area concerning the EFSF was a typical political compromise. Unfortunately, compromise could not necessarily work in a debt crisis. There are, in essence, two ways to solve a debt crisis: through a bail-out or through default. The leaders of the euro area got itself an arrangement that represents only an emergency facility and constitutes a scarcely credible intermediate solution between bail-out and default[112].

On 16 December 2010 the European Council agreed an amendment to Article 136 of the TFEU[113] that says: "The member states whose currency is the euro may establish a stability mechanism to be activated if indispensable to safeguard the stability of the euro area as a whole. The granting of any required financial assistance under the mechanism will be made subject to strict conditionality." Later, on 11 July 2011 the European Stability Mechanism itself has been established by a treaty among the Member States of the euro area: the Treaty Establishing the European Stability Mechanism. The European Stability Mechanism becomes an intergovernmental organization under public international law, located in Luxembourg. It would be led by a Board of Governors. Each Member States would appoint a governor and the board would either be chaired by the President of the Euro Group or by a separate elected chair from amongst the governors themselves. There is a disagreement among member States concerning the funding of ESM, since for the rescue of three countries Greece, Ireland and Portugal over two years of crisis between 2010 and 2011, euro area countries (Germany above all) have had to intervene for a total of 273 billion euros, plus other 130 billion for the second loan to Athens. However, the worsening of the crisis of the euro, the risk that Greece could leave the euro area, seem to influence a decision to bring forward to 2012 the birth of the ESM, but nothing looks taken for granted.

Fourth, again in March 2011 the European Council agreed on a new plan, named the 'Pact for the Euro', which tries to design a new governance of the EMU and to achieve a better economic policy coordination for leading to a higher degree of convergence. The plan was advocated by the French and German governments and it is firstly designed as a more stringent successor to the Stability and Growth Pact, which has not been implemented consistently. In fact the 'Pact for the Euro' constitutes an attempt to give new and effective national budgetary rules. Actually the Pact has come out with four broad strategic goals along with more specific strategies for addressing these goals. The four goals are: fostering competitiveness, fostering employment, contributing to the sustainability of public finances, reinforcing financial stability. So this 'Pact' contains crisis management and resolution principles and procedures, that did not exist before, but also a wider economic policy framework to the

[112] To deepen the technical aspects of the financial rescue mechanisms and their ineffective solutions see Schilirò (2011).

[113] The amendment will not come into force until it has been ratified by each member state according to their respective constitutional requirements, and cannot come into force until 1 January 2013.

Member States of the euro area. While the 'Pact' comes with specific strategies, these are not seen as compulsory, the choice of the specific policy actions necessary to achieve the common objectives remains under the responsibility of each country. The aims and strategies of the 'Pact' are to be updated yearly with the following procedure: each year participating Member States will agree at the highest level on a set of concrete actions to be achieved within 12 months.

A positive aspect included in this new economic policy framework is the recognition that not all crises are rooted in a lack of budgetary discipline. It is now agreed that financial stability and macroeconomic stability also matter. Yet several questions remain open, as for instance the true capacity and the will of each Member State to adopt the necessary measure to fulfill the requirements of the 'Pact', thus it remains an agreement on principles without a real enforcement. Daniel Gros (2011) correctly pointed out that the 'Pact' contains a list of desirable policy goals but no means to implement them. In particular, the employment and competitiveness goals remain too vague, and are not really embedded in a framework which is clearly oriented to growth. As Darvas, Pisany-Ferry and Sapir (2011) have argued a success of any program to overcome a debt crisis is conditioned by the capacity of a country (like Greece) to meet the fiscal adjustment targets and also by the ability of the country's economy of triggering the growth, since without stimulating growth any fiscal consolidation program will not succeed[114].

Finally, it is well known that the ECB has the restricted mandate of look after to price stability in the euro area and has not the possibility of printing money to help the member countries in financial difficulties, so that it cannot be a lender of last resort as the Federal Reserve in the United States. However, in December 2011 ECB has launched a *Long Term Refinancing Operation* (LTRO), a program of making low-interest loans with a term of 3 years (36 months) and 1 per cent interest to European banks accepting loans from the portfolio of the banks as collateral[115]. This is unconventional measure taken by ECB to offset the lack of liquidity that has occurred in the credit market.

Despite the quite frequent meetings of the European Council in 2010 and 2011 (the Heads of the Government of the euro area made 13 meetings over the two years) and the three Euro Summits (one in 2010 and two in 2011), which produced the set of decisions above cited, the confidence in the euro is diminishing, because the markets and many observers (economists, opinion makers, businessmen, etc.) have the feeling that the European authorities still do not have governance mechanisms capable of making important decisions and also implementing them. Moreover, the single currency, that should force the countries of the euro area to respond to the crisis in a unitary manner, has created, on the opposite, a situation in which all countries seem unwilling to act. Thus the hypothesis of breaking the euro has become real, despite the constant reassuring statements of European authorities that deny this hypothesis.

In the next section I examine the institutional aspects and the economic policy issues that have determined the crisis of the governance of the euro area.

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[114] Greece is an economy which is recession since four years and the fiscal consolidation does not seem to lead the country on a virtuous path that allows the economy to get out of debt crisis and absence of growth.

[115] In particular, on December 21 2011, the ECB has placed an auction with about 489.19 billion euros expiring on January 29, 2015 (and early payment option in a year) at an audience of 523 bidders in Europe. The rate of supply of liquidity was fixed on the reference 1 per cent and was expanded the range of assets that European banks could put as collateral for these loans. This LTRO is primarily designed to provide greater bank liquidity, but it should also lower sovereign yields since euro area countries can use their own sovereign debt as collateral, which, in turn, increases demand for the bonds and lowers yields.

9.4 What's wrong in the governance of the Euro? Institutional aspects and economic policy issues

The euro area is characterized by a crisis of governance. This is caused by many factors, but an important role has been played by the European authorities, who have pursued a strategy of small steps and not short times in the management of the crisis of the euro area. But now that the times of the economy and financial markets have become even more fast it is necessary to think about a different method. From this consideration it follows that the timing of the policy and its procedures, at European level but also at the level of the individual Member States, are too long compared to those of the economy and the markets. Moreover, there were two ways to proceed in the face of crisis: muddling through or adopting radical solutions. The European institutions have preferred to follow the first, thus following their traditional way of proceeding. In addition, the new governance of the euro, which is laboriously carried out by the European institutions and by the individual Member States, takes time; however, the path has been characterized by the statements of the European authorities that are often contradictory and contribute to uncertainty. This behavior has caused negative reactions in the markets and makes more difficult to resolve the crisis. The European authorities showed instability in their decisions. At first they were very patient in financial terms, after too they became too much demanding with financial discipline. At the same time all the countries of the euro area seem unwilling to act against the crisis. The virtuous members States do not want to pay for those in difficulty, while the weaker countries are certainly not pleased with the sacrifices that Europe asks.

The crisis also revealed some new facts about the governance of the euro area. Firstly, a greater intrusion of European institutions (European Council, Ecofin, Eurogroup, ECB) in the lives of citizens of the Member States. Secondly, the crisis has caused the de-commissioning of the European Union: in fact, the European Council decides on its own the political and economic strategies without answering before the Commission and the European Parliament. Another aspect of the emptying of the role of the Commission is represented by the fact that the Commission counts less while France and Germany are more influential. Thus, it has been established a kind of duopoly in the European governance. The France-Germany duopoly that has characterized the management of this crisis in the euro area has, de facto, changed the rules of governance[116].

A governance of the euro area that is effective requires that the member states should adopt a coherent strategy made of three steps: coordination, decisions and actions. Coordination problems obviously arise among member states of a currency union, however a policy in which there is a high degree of coordination is crucial in the governance of the euro. But coordination must be followed by appropriate decisions where the cooperative attitude should prevail. Actions are also necessary, otherwise decisions remain wishes without effects, consequently, effective mechanisms of enforcement of decisions are needed.

Unfortunately the EU is a hybrid system, on some issues the governments of various countries are willing to accept the decisions at European level, on the other they claim national sovereignty. The institutional framework of the European Monetary Union, in particular, appeared, since its inception,

[116] One consequence of this duopoly could lead to a change of governance of the ECB, where the vote of the governors should be weighted by their GDP. This implies a shift from democratic governance to management based on the credit strength of the member countries.

clearly incomplete and inadequate. Examples of inadequacy of the institutional architecture are: the relationship between the Member States of the euro area and the EU institutions is unclearly defined, because of the strong interests of the Member States. Thus, national interests still prevail over the interest of Europe and within the European institutions. But also important problems are the mismatch between the growing number of policies decided by the European Union and the policies carried out at national level, and also the lack of a effective policy at European level that is able to decide on economic issues and to implement them. These problems create an unstable environment and negative consequences, which have become more evident in the euro crisis.

And yet, it looks awkward the position of the ten Member States of non-euro area, who sit in the European Council but do not express themselves on the issues concerning the euro area. Although such decisions influence as well the non-euro area members. There is, therefore, a problem of transparency and legitimacy in the decision process at institutional level (Schilirò, 2011).

I firmly believe that a set of policy measures should be taken to enable the euro area to survive. First, an immediate and credible program to deal with excessive sovereign debt and achieve debt sustainability particularly in the economies of the PIIGS, since the creation of EFSF or of ESM do not appear in the current state a convincing answer to solve the problem. Moreover, the eurobonds may be not the correct solution to the sovereign debt crisis since they tend to solve the problem through the socialization of the debt[117]. Instead it is more appropriate to adopt a policy, based on coordination, to overcome the dysfunctional politics across the Member States and to avoid the negative external effects of the macroeconomic imbalances. This policy, aiming at the creation of a fiscal union in the euro area, should offer reciprocal insurance to Member States and reduce income volatility within the region, so to affect the root of the problem. In any case, it is necessary a far more aggressive plan to reduce budget deficits with binding fiscal rules for the Member States, that even the 'Pact for the Euro' does not guarantee, therefore it is required the introduction of mechanisms that credibly achieve medium-term fiscal sustainability. But it is very crucial, make the economies of the "PIIGS" more competitive in the near future with structural reforms that are framed or bound at EU level. In fact - as Kirkegaard (2011) also emphasized - "without improving external competitiveness and, at the same time, increasing exports/reducing imports, the euro area periphery will not be able to restore domestic economic growth during their prolonged period of fiscal consolidation". Of course, a supportive monetary policy from the ECB is needed, while the ECB should become *de jure* or *de facto* a lender of last resort with respect to the governments and the banks. This wider role of the ECB will allow a more strong and effective monetary policy and economic policy of the euro area on the whole. Furthermore, it is very important the good health of the banking system, since many European banks still have in their balance sheet too many "toxic assets" and risky sovereign bonds. Lastly, an institutional change must be implemented, that reduces the instability in the financial sector.

I also believe that, since the euro area have shown during its crisis strong macroeconomic imbalances, it can be helpful to envisage a new economic policy strategy. To avoid that the euro area becomes a transfer union, Carfì and Schilirò (2011) have suggested a policy strategy based on competition. First, they have pointed out the primary role of competitiveness in determining growth and the relation between competitiveness and macroeconomic imbalances. Carfì and Schilirò have

[117] Although the "Blue Bond" proposed by Delpla and von Weizsäcker (2011) is a sensible proposal.

argued that to overcome macroeconomic imbalances it is necessary a medium term strategy for competitiveness and growth, based on innovative investments and a process of structural change of the production system. Within this broad strategy, current account imbalances, in particular, can be addressed through a competitive strategy, which implies a cooperative attitude aiming at growth among the member countries of the euro area, despite their divergent interests. The competitive strategy will provide a *win-win solution* to the actors of the game and can constitute a new macroeconomic policy tool to help solving the imbalances problems and contribute to overcome the economic crisis in a medium-run perspective.

The euro area is therefore characterized by strong imbalances, and the governance of the euro appears inadequate to address these imbalances. The experience of the current crisis where every Member State fights alone against its disequilibrium in sovereign debt or in current account demonstrates the failure of this policy strategy. The competitive strategy is a viable and effective way to overcome the isolation of individual countries before the crisis. However, a more stable and comprehensive solution for the governance of the euro area requires a deep change at institutional level. This change of governance demands a greater European integration, with a central fiscal entity at European level which requires a transfer of sovereignty from the individual Member States and the European Central Bank that becomes lender of last resort. But also a different relationship between the member countries of the euro zone that, barring the duopoly France and Germany and, *de facto*, the German leadership, give to the Commission the role of coordinator and of third party, return to the European institutions such ECB, Ecofin, Eurogroup their proper and independent role and give to the European Parliament its centrality.

9.5 Conclusions

The euro crisis has made the pessimism regarding the euro area more prevalent. For over two years European authorities and political leaders have promised to do whatever it is needed to save the euro area, but problems remain unsolved and solutions seem quite far. The euro area is currently in recession with high unemployment and strong macroeconomic imbalances between the various Member States. Moreover, the prolonged stand-off over the rescue plan for Greece, the corresponding risk of a sovereign default which could spread to Portugal, Spain and Ireland and the financial difficulties of Italy have definitely brought a gloomy picture of the European currency union. All this, in turn, highlighted the profound weaknesses in the governance of the euro area, the uncertainties of the European authorities, and posed the issue of German leadership.

In this work I have analyzed the institutional framework of the euro area, discussing the issue of the rules and of the discretion in the governance of the euro. I have also examined the remedies put in place by the European authorities to overcome the crisis and their flaws. The last section of the work has focused on institutional aspects of the governance of the euro and on economic policy issues that the crisis in the euro area have stressed, suggesting some basic outline for the new institutional architecture and feasible economic policy solutions. These solutions imply a more strong European political integration where the European institutions coordinate and are capable of implementing the economic policy for the whole euro area, with a central fiscal entity at European level and the European Central Bank that becomes lender of last resort. Only in this way it is possible

to restore credibility in the euro area, create a stable macroeconomic environment, stimulate the economic growth so to overcome this long and hard crisis.

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Chapter 10

MONETARY UNION AND THE ROLE OF THE MONETARY POLICY FROM THE POINT OF VIEW OF SELECTED THEORETICAL APPROACHES

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Abstract

The effective international monetary system is an important precondition to a successful fulfillment of international economic transactions. The existing development of international monetary systems indicates the need of one strong currency, at most a small number of national currencies to ensure international transactions. It has to be a currency (currencies) that would be based on a strong national economy, especially in the current period that is marked by the strengthening of the long duration of international economic transactions. The instability of the national currency that would take place of the international (world) currency is connected to depreciative as well as revaluation processes, which does not contribute to the development of the world economy. In the chapter we provide a brief overview of key milestones in the process of the European monetary integration. We also evaluate positive and negative aspects of this process in the view of selected theoretical approaches.

Keywords: monetary union, monetary integration, euro.

10.1 Monetary Union

The effective international monetary system is an important precondition to a successful fulfillment of international economic transactions. The existing development of international monetary systems indicates the need of one strong currency, at most a small number of national currencies to ensure international transactions. It has to be a currency (currencies) that would be based on a strong national economy, especially in the current period that is marked by the strengthening of the long duration of international economic transactions. The instability of the national currency that would take place of the international (world) currency is connected to depreciative as well as revaluation processes, which does not contribute to the development of the world economy.

A form of the economic integration of two or more states with the free movement of goods, services, capital and labor force in which national currencies are replaced by one single currency

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effective in the whole territory and the national currency sovereignty of member states is fully shifted to the supranational level is the *Monetary Union.*

The establishment of the monetary union results according to *Kunešová and Cihelková et al.* (2006) following *advantages*:

- Improvement of the budgetary discipline of member states;
- Decrease of the level of inflation;
- Savings of direct transaction costs related to the conversion of national currencies and hastening of bank transfers;
- Savings of indirect transaction costs (simplifying of accounting, decrease of the possession of different foreign currencies);
- Decrease of the exchange rate risk;
- A stronger currency stability on international financial markets;
- Decrease of the average unemployment rate assuming a higher mobility of the labor force,
- Decrease of the amount of required foreign currency reserves.

Basic reasons for favorable attitudes towards the single currency are according to *Šíbl and Šáková* (2002) and *Baláž et al.* (2010) the following:

- *Economic advantages* (decrease of the inequality between national currencies, the economic convergence, the economic stability and development, the growth of productivity and competitiveness to the rest of the world, the growth of esprit de corps and the economic integration);
- *Political advantages* (the need of the monetary union as a support of the European unification, the growth of the cooperation among member states, the reduction of nationalism and the development of l' esprit communautaire, the decrease of the dominance of one state of currency above others);
- *Commercial advantages* (limiting or exclusion of exchange rate fluctuations, the need to completely establish the joint market);
- *Monetary reasons* (the exclusion of monetary speculation, the decrease of inflation and interest rate, the increase of the financial and monetary discipline, stable currency rates and the improvement of the control of capital markets).

Disadvantages of the establishment of the monetary union are according to *Kunešová and Cihelková et al.* (2006):

- The loss of the national monetary sovereignty (member states of the monetary union have no opportunity to enact independent monetary policy);
- The loss of the currency rate as a means of the economic policy;
- The loss of the possibility to regulate the economy through interest rates;
- The loss of a certain autonomy in the field of the fiscal policy (the fiscal policy is still realized by national governments but the country is required to exercise such fiscal policy that ensures the abidance of fiscal convergence criteria);
- Huge financial costs related to the introduction of the single currency.

According to *Šíbl and Šáková* (2002) it is possible to classify arguments of those opposing the single currency to the same groups as the supporting ones. Stated are mostly practical problems, including the lack of convergence between member states, the unpreparedness of the country for the

single currency and the existence of huge technical problems with its introduction. Among economic problems, there are: the imbalance between national economies, the impairment of individual national economies and risks that it will result in the "too centralized and socialist economy". Political arguments of opponents of the single currency include the loss of countries to maintain the control of their own economy and the fiscal policy and the loss of sovereignty.

10.1.1 Convergence criteria

In order to approximate the economic development of countries of the monetary union it is necessary to fulfill convergence criteria by these states. In the case of the European Monetary Union, they are the following *convergence (the so-called Maastricht) criteria* formed by specific *monetary* and *fiscal criteria.* The common characteristic is the closer mutual interrelatedness of economies that will participate in the single currency.

Monetary criteria:[121]

- *Criterion of the price stability*.

The average inflation rate monitored during one year must not exceed *more than 1.5 percent* of the average annual inflation rate of three most price stable countries (countries with the lowest rate of inflation). The inflation is measured according to the harmonized index of consumer prices on a comparable basis that takes into account differences in national definitions.

- *Criterion of the convergence of interest rates.*

The average long-term nominal interest rate must not during one monitored year exceed *more than 2 percent* of the average interest rate in three most price stable countries. Interest rates are surveyed on the basis of the long-term state bonds or comparable obligations allowing for different definition in individual member states.

- *Criterion of the membership on the mechanism of exchange rates of the European Monetary System.*

The exchange rate of the national currency is necessary to be kept in the allowed fluctuation zone in the mechanism of exchange rates (*Exchange Rate Mechanism II* – ERM II) without devaluation during the *period of 2 years.* The exchange rate can fluctuate in the zone of ±15 per cent but close to the central parity of the Euro without the devaluation to any currency of any member state.

Fiscal criteria:[122]

- *Criterion of the deficit of public finances.*

The planned or the actual deficit of public finances must not exceed *3 per cent of the GDP* in market prices with exceptions when:

- The proportion decreased significantly or was constantly decreasing till the level that is approximating the recommended value,
- The exceeding of the recommended value was only exceptional and temporary and the proportion still approximates the recommended value.

- *Criterion of the public debt.*

[121] Article 109j, Title VI of the Treaty establishing the European Community and the Protocol on the convergence criteria.
[122] Article 104, Title VI of the Treaty establishing the European Community and the Protocol on the excessive deficit procedure.

The proportion of the public debt to the GDP in market prices *must not exceed 60 per cent* except for cases when the proportion is decreased significantly and approximates by at a satisfactory rate the recommended value.

The term debt is understood as the gross sum of debts in nominal values at the end of the year consolidated within the state sector and between individual branches (government, regional and local authorities or social security funds) with the exception of commercial transactions. During the unfavorable progress of public finances, the European Council issues a recommendation for the improvement of proportions in the field. If these are not implemented into the economy of the state it can result in the reassessment of the credit policy of the European Investment Bank (EIB) towards the member state or the infliction of an interest rate-free deposit in the EIB for the period of the excessive deficit, or there can be established appropriate penalties (*Kotlebová* & *Chovancová*, 2010)

Maastricht criteria represent the so-called *nominal convergence,* i. e. the fulfillment of criteria mentioned in the Maastricht Treaty. From the perspective of member states, the actual convergence is also important, i.e. the approximation of the standard of living of the population to developed member states of the European Union. From the perspective of the process of the introduction of the Euro, the key factor was the inflation rate since the country with significantly lower prices would rapidly close onto neighboring countries with higher prices. The actual convergence is measured mainly according to the indicator of the GDP per inhabitant in the Purchasing Power Parity (PPP). The process of approximation of the price level between countries with different standards of living was studied by Balassa, B. and Samuelson, P.A. Their studies indicate a thesis according to which the growth of prices in the marketable sector is cause mainly by the growth of the labor productivity, and in the unmarketable sector it is caused by the growth of salaries and prices and thus the inflation. This phenomenon is labeled as the ***Balassa-Samuelson Effect*** and the established inflation differential is also called a dual inflation (*Benčík at al*., 2005; *Vladová*, 2007; *Vincúr*, 2008; *Muchová*, 2008).

10.1.2 Process of the establishment of the European Monetary Union

The process of the establishment of the European Monetary Union can be divided into three phases. The first phase that lasted from July 1, 1990 to December 31, 1993 started the first stage of the economic and monetary union. Its aim was to eliminate last barriers of the free movement of the capital within the European Community. Member states narrowed the fluctuation zone of national currencies and strengthened the cooperation of individual national banks during this stage. Capital movements started to be fully liberalized in the member states of the European Union. The decision of the introduction of the single currency was passed by member states of the European Union in Maastricht in February 1992.

The Treaty of the establishment of the European Community (Treaty of the European Union) signed in the Dutch Maastricht in 1991 that came into effect on November 1, 1993 started the second phase. The second phase lasted from January 1m 1994 to December 31, 1998 aimed at the establishment of the European Monetary Institution, to strengthen procedures focused on the coordination of economic policies on the European level and to fulfill convergence criteria that conditioned the acceptance into the European Monetary Union. Member states of the European Union

decide to confront the "applicable deficit" and reach the economic convergence. The European Union Commission passed on May 31, 1995 the Green Paper on the Single Currency that represented the script of the transition to the single currency. The European Council agreed upon the fact that the new currency will be called the "Euro" and passed the definite script of its introduction in Madrid on December 15 -16, 1995. The Treaty on the European Union obliged the Council to at latest till December 31, 1996 decide by a qualified majority whether:

- The majority of member states fulfills conditions of the introduction of the single currency;
- It is convenient for the European Union to enter the third phase and if yes, to set the date for the start of the third phase. The Treaty of the European Union stated that if the date of the third phase will not be set till the end of the 1997, the third phase will start on January 1, 1999 for those member states that would fulfill convergence criteria. In this case, the Council is obliged to confirm in the structure of heads of states or leaders of governments which member state fulfills conditions of the introduction of the single currency until July 1, 1998 (based on convergence criteria and in the light of economic data for the year 1997).

Since by the end of 1996 the majority of member states did not fulfill convergence criteria, the start of the third phase was set on January 1, 1999.

The third phase started on January 1, 1999 by the establishment of the European Monetary Union. Its members became 11 of member states of the European Union (Belgium, Finland, France, the Netherlands, Ireland, Luxembourg, Germany, Portugal, Austria, Spain, Italy) with exceptions of the Great Britain, Denmark, Sweden and Greece. The Great Britain and Denmark opted-out of the entrance into the third phase and negotiated the so-called opt-clause in the Maastricht negotiations. Sweden refused to participate in the third phase (without negotiating the opt-clause) because of political reasons. Greece that at that time did not fulfill required convergence criteria entered the European Monetary Union on January 1, 2001.

On January 1, 1999 fixed exchange rates of national currencies of member states were established. The Euro was established as an independent currency and the ECU was exchanged to Euro in the ratio of 1:1. The European Central Bank started its function and became responsible for the single currency policy, the European system of central banks was established.

The third phase of the process of the establishment of the European Monetary Union was divided into two stages. In the scope of the first stage (January 1, 1999 to December 31, 2001) the Euro was used exclusively as a cashless currency. National banknotes and coins of member states of the European Monetary Union stayed in circulation and were used in the cash payments. Each subject could decide for the cashless payments whether the national currency or the Euro will be used. Since January 1, 1999, transactions on capital markets and financial transactions of Institutions of the European Union were made exclusively in the Euro. Since January 1, 2002, when the second stage of the third phase started, the Euro banknotes and coins were introduced into circulation and gradually national currencies of member states were moved from the circulation. In this stage, each subject could decide whether the Euro or the national currency will be used in cash transactions. Cashless transactions were realized exclusively in the Euro. The Euro was supposed to be introduced in all market transactions in January 2002 and national banknotes and coins should have been moved from the circulation at latest on February 28, 2002. Since March 1, 2002, there is only the Euro in the

circulation in member countries of the European Monetary Union and the process of the establishment of the fully operational monetary union was completed.

Table 10.1 Conversion rates of national currencies of the Eurozone member states to the Euro

EMU Member state	Conversion rate (national currency /1 EUR)	Year of the introduction of the Euro
Belgium	40.3399 BEF	1999
Cyprus	0.585274 CYP	2008
Finland	5.94573 FIM	1999
Estonia	15.6466 EEK	2011
France	6.55957 FRF	1999
Greece	340.750 GRD	2001
The Netherlands	2.20371 NLG	1999
Ireland	0.787564 IEP	1999
Luxembourg	40.3399 LUF	1999
Malta	0.429300 MTL	2008
Germany	1.95583 DEM	1999
Portugal	200.482 PTE	1999
Austria	13.7603 ATS	1999
Slovakia	30.1260 SKK	2009
Slovenia	239.640 SIT	2007
Spain	166.386 ESP	1999
Italy	1 936.27 ITL	1999

Source: European Central Bank. Available at: http://www.ecb.int, 12.6.2012.

The Euro as the single currency of the European Monetary Union received an established a three-figure IOS (*International Organization for Standardization*) code *EUR*. As the symbol for the Euro a double horizontally crossed out Greek letter epsilon (€) is used. The letter epsilon should symbolize Greece as the cradle of the European civilization and the letter E as the initial letter of the European continent. The double crossing of the letter should symbolize the stability and the strength of the Euro.

While the original member states (the old 11 states and Greece) the Euro was introduced into circulation through *gradual transition* at first in cashless transaction (since 1999) and later in cash payments (since 2002), the *Big Bang Method* - the simultaneous introduction of the Euro in cash and cashless payments - was used in countries that were accepted in the European Monetary Union and introduced the Euro on January 1, 2007 - Slovenia, a year later January 1, 2008 - Cyprus and Malta, on January 1, 2009 Slovakia as the 16th member of the European Monetary Union and on January 1, 2011 - Estonia.

10.2 The aspects of the secession from the European Monetary Union

The European Monetary Union is considered, according to the rule of law, to be a permanent union and the Maastricht Treaty does not reckon on secession or exclusion of a member state. The Article 56 of the Vienna Convention coming under the international contract law valid since January, 1980 states that such termination or withdrawal from the contract that does not include this measure is possible only after being proven that during the signing of the contract the parties involved intended to

allow such measure, or if the nature of the contract allows this possibility. Based on this treaty, countries assenting to it might state that at the time of the signing of the Maastricht Treaty they intended to allow the secession from the European Monetary Union. They could possibly requisite the right to secede from the Eurozone based on substantial changes in circumstance. However, the legal resolution of the problem would probably not simple. Based on this, it is possible to assume that countries would aim for the secession from the Monetary Union only in extreme cases of unsustainability of the current situation. According to *Palacková* (2007, pp. 126-127) this problem is linked with the German Supreme Court decision from 1993 according to which Germany is allowed to secede from the European Monetary Union in the case of not achieving the aim of stability (see further: *Cornelius, Trimbur*, 2000). Contrary to the non-existence of the defined plan of the dissolution of the European Monetary Union, the risk of the dissolution is high enough for serious consideration. According to *Scott* (1998, pp. 207-228), there existed an assumption of not negligible probability of the dissolution of the EMU even during the third phase of its introduction. Scott considered the three-year period during 1999-2002 as a kind of probation period with the Euro being introduced only in the cashless form with national currencies in parallel circulation.

10.2.1 Economic reasons for the secession of the European Monetary Union

In spite of the fact that the dissolution of the European Monetary Union is legally disputable, the monetary disintegration is theoretically conceivable. In relation to the monetary disintegration, there are following scenarios categorized as *(*see further: *Cornelius, Trimbur,* 2000*)*:

- Specific country secedes from the European Monetary Union;
- Specific country is excluded from the European Monetary Union;
- Dissolution of the whole European Monetary Union.

A specific country can decide to secede from the European Monetary Union on several grounds. Among them, the perception that according to its own interests the economic policy in the common monetary area is too restrictive (*hypothesis of excess demand*); or it is disappointed with the lack of stabilization efforts of other member states of the Monetary Union (*dissatisfaction hypothesis*).

Similarly to the decision on the admission to the Monetary Union, the decision of secession from the Monetary Union is based on the evaluation of relative advantages and costs resulting from this measure *(Palacková,* 2007, pp. 130-132*)*. That means that for the country to remain in the Monetary Union, advantages of the continuing membership have to outweigh advantages of its possible secession. The secession of the Monetary Union advantage is the regaining of the control over the own monetary policy as an instrument of protection from outer economic shocks as well as the regaining of control of incomes from money issues that would to a certain extent lighten the state budget of the country. The disadvantage of the secession would be the loss of benefits in the form of decreased transaction costs and the elimination of the exchange rate risk and similarly in the form of the price stability.

In the case of the dissatisfaction hypothesis, the insufficient efforts for stability in many countries of the Monetary Union would result in the disproportionate growth of the debt, which would raise the pressure on the European Central Bank to loosen the inflation and thus indirectly reduce the value of the debt. The acceleration of the inflation could, in countries of the European Monetary Union

long accustomed to a monetary stability, raise a general disappointment and disapproval. In that case, according to *Fels* (2005) it would be only a question of time for some political party to come with the agenda to lead the country out of the inflation and back to the monetary stability of its own national currency.

The return to the national currency would not be entirely possible mainly for small open economies. The monetary policy of these countries cannot afford to be completely independent not even in the case of the country not participating in any of monetary unions. Anyways, the secession of the country from the Monetary Union would not represent a simple return to the original state before the admission concerning the difficulties with the re-introduction of the national currency, with the legal uncertainty concerning the denomination of existing obligations, with the unexpected "strength" of the new currency, with the control of the money supply, with the reluctance of other countries to officially recognize the newly established currency, and relating to, according to *Scott* (1998, pp. 207-228) the so-called "*Euroization*" as the effort to suppress the use of the common currency in the process of the introduction of the new weaker currency, which would isolate the seceding country even further.

A successful secession from the Monetary Union would require a certain form of cooperation with other countries remaining in the Monetary Union. Similarly, the exclusion of a country from the Eurozone would not be possible without the cooperation; the exclusion can result from the constant disregard of the budgetary discipline. Without the consent of the country concerned with its exclusion from the Monetary Union, this country could continue to create the deficit payable in the common currency, thus constantly affecting all states of the Monetary Union. The probable solution would only be the introduction of a new common currency for remaining countries, which would result in the exclusion of the non-cooperating country of the original Monetary Union.

In the case of a strong country's effort to secede from the Monetary Union (e.g. Germany or France), it can be assumed that this could lead to the dissolution of the whole Monetary Union. In this case, the re-introduction of national currencies would be easier mostly for countries with weaker currencies. Inflationary pressures could threaten countries with stronger currencies. Indeed, if the dissolution of the Monetary Union was realized through the introduction of fixed exchange rates of new national currencies to the Euro, subjects would try to sell Euros for the highest price possible, which would result, according to *Scott* (1998, pp. 207-228) in the fact that the specific Central Bank would be pressured to increase the amount of the money in circulation.

Despite the absence of a defined plan of the dissolution of the European Monetary Union, the risk of the dissolution is according to several authors significant enough to be considered seriously. The preservation of national payment systems, as well as the preservation of national central banks and debt instruments of national governments is considered by these authors as an "insurance" in case of the failure of the Monetary Union.

In the scope of the widely used principle of subsidiarity, the creation of common foreign reserves was limited. National central banks surrendered only a part of their reserves to the ECB; however, they still maintain the right for these reserves. In the case of the dissolution of the European Monetary Union, national central banks would have a share of foreign reserves directly and the rest would have to try to be recovered from the ECB. According to *Scott* (1998, pp. 207-228), the question is whether it was really the principle of subsidiarity or, in fact, the intended protection of individual

states in the case of the failure if the Monetary Union through retaining of all required structures for the possible return to their own currencies.

10.2.2 Negative consequences of the secession from the European Monetary Union

The following problems would have to be addressed in case of the secession of the country from the European Monetary Union, or its dissolution *(Palacková,* 2007, pp. 132-133*)*:

- Contracts continuity - the enforcement of the fulfillment of contracts in newly denominated national currencies might be problematic, mainly in combinations of: debtor from seceding countries and foreign creditor. The conversion of Euro liabilities to the new currency would surely be recognized by domestic courts. However, foreign courts could hold a different opinion, most probably based on the lex monetae legal maxim. It is a rule based on which it was possible to replace the Mark for the Reichsmark in Germany, since Germany was their issuer. The application of the said legal maxim results in the fact that governments of countries seceding from the European Monetary Union would not be allowed to simply exchange the Euro for the new currency, since they were not its issuers. This means that regardless of the decision of national governments, all contracts denominated in Euros issued in individual countries prior to their secession from the European Monetary Union would remain payable in Euros. The lex monetae legal maxim would not be possible to apply reliably even in the case of the dissolution of the European Monetary Union as a whole. In this case, the original issuer of the Euro as the common currency would cease to exist. This would result in the problem of who should be considered as the original issuer since all countries would try to introduce own currencies at the same time. The issues would arise concerning the enforcement of liabilities, mostly concerning their denomination.
- Conversion of debts - the differences of opinions on conversion of Euro debts to the new national currency lies in the fact whether these are public or private debts. If the government of the country wields an unlimited power over the management of the public debt, it could decide to convert the public debt into the new currency, in case its new currency after the secession of the Monetary Union would be weaker. This would result in the decrease of the public debt. Creditors would consider this measure as a breach of the obligation - the so-called default.
- Country's rating - the secession from the European Monetary Union or its dissolution would be visible in the rating of individual countries, thus, in the cost of their future debt. The confidence of investors in the new currency would not be too high in the beginning, which means that the cost of the debt would reflect the risk of the possible inflation.
- Operation of business systems - threats of representatives of some countries on possible efforts in the secession from the Eurozone results in apprehensions of many software engineers. The introduction of the Euro required a re-programming of the software to operate with the new currency. This was the change between countries and their currencies. Prior to the introduction of the Euro, the valid rule stated that one country = one currency that had to be replaced by the rule - several countries = one currency. The transition of business systems to the Euro was planned and introduced gradually, in case of a country's secession from the Eurozone the operation of business systems might be disrupted.

10.3 The position of the Central Bank and the role of the monetary policy from the point of view of selected theoretical approaches

The European Central Bank's representatives declare that the European Central Bank does not monitor more objectives, the key objective is just provision of the price stability in the medium-term horizon. The first pillar does not represent the objective for the growth of money stock, the second pillar does not represent the inflation targeting. Both pillars represent just two different aspects of the inflation analysis, namely the monetary and nonmonetary approach. The first pillar of the monetary analysis becomes the subject of the criticism of quite a number of experts, predominantly by the reason that the European Central Bank did not explained the formal connection of money in the inflation process nor the causality of money and prices more particularly (see in research studies of Svensson, L.E.O., Bean, Ch., Bofinger, P., Eijffinger, S., Wyplosz, Ch. and others).

Baldwin and Wyplosz (2008) promote the opinion that the monetary policy of the European Central Bank carried out on the basis of the principle "one size fits all" that does not have to suit all countries at the same time in such heterogeneous economic field as the euro area actually is (and upon the enlargement in the larger extent it really will be). This "one size" is represented by a single nominal (short-term) interest rate for the whole euro area. The problem is that the monetary policy does not influence the economy by a nominal interest rate, the essence is a real interest rate (i.e. the nominal rate without expected inflation). As well, they restore the question why the team of experts preparing the Maastricht Treaty did not pay attention to the Optimum Currency Area Theory (OCA).

According to *Sojka* (2010), the common requirement of the independency of the central bank, along with the transparency and trustworthiness of its monetary policy based on the "new consensus" applied by the European Central Bank, resulted in the inappropriate accent of the antiinflation monetary policy (which is, in addition, equipped by high level of independency at monitoring of currency objectives) at the expense of economic growth and employment.

Korda (2010) points out the fact that the relation of a growth of monetary aggregate M3 and the reactions of the European Central Bank is not clear by its basic interest rate. The annual growth of M3 exceeding 4.5% is interpreted repeatedly by the European Central Bank as non-risky for price stability[123]. It is questionable, to what extent the monetary analysis is relevant in the European Central Bank. It is possible to consider the revision of the monetary pillar of May 2003 as the decrease of its significance. In addition to the shift of the monetary analysis to the second place in introductory statements of the European Central Bank's governor, the periodical annual revisions of the reference value for M3 growth have been cancelled. It is possible to state that the active task of money is not the matter either in the European Central Bank, only a paradox is confirmed that the inflation is a monetary phenomenon in the long-term period (which the monetary analysis is focused on), while in the short-term period (which the monetary analysis is dealt with) money is not used in the explanation of the inflation at all. The use of money in the monetary policy of the European Central Bank thus corresponds rather to pragmatic use of information provided by monetary aggregates (similarly as for other central banks) while it differs rather just by a detachment of monetary analysis into a special

[123] Authors' remark: The European Central Bank regularly releases more detailed M3 development in its quarterly bulletins since January 1999.

pillar, the generation of which can be regarded as a heritage from German Bundesbank, where the effort apparently consisted in a transfer of its reputation to the European Central Bank.

According to *Iša and Okáli* (2008), it is not possible to ignore a slow growth of economic performance of the euro area and lagging in the dynamics of its key indicators of the supply side (i.e. labor productivity, employment and potential product) which are often assigned to a rigid economic and political and social environment. After all, not all members of the European Monetary Union are satisfied with a single monetary policy which cannot take needs and interests of particular Member States into account. Some difficulties of the European monetary Union have their roots in the very process of its origination and other are connected with its asymmetric architecture and with considerable economic heterogeneity. In addition, *Iša and Okáli* (2008) call attention to the fact that a special significance has, from the point of view of forming of monetary policy and its expected effects, the disputes about foreign exchange rate and "trade-off" inflation - unemployment. The Eurosystem does not directly intervene the managing of these thorny problems, however its decisions are one of the keys to the macroeconomic stability, sustainable growth and thus to the managing of specific economic and political questions. According to authors, the Eurosystem has no (as opposed to the American Fed) strong support in the aims included in the Maastricht Treaty. While Fed is characterized by a balance of basic macroeconomic objectives, the European system of central banks define the price stability as the primary objective and very equivocate about the secondary objectives (economic and social advance, high unemployment). The price stability takes high priority over the secondary objectives, which are more or less ignored by the European Central Bank. In practical decision-making, it may be expressed by a motto "Price stability by all means". Therefore it is not surprising that not all members of the euro area agree with such an approach.

10.3.1 The position of the Central Bank and the role of the monetary policy from the point of view of the new classical macroeconomics

The new classical macroeconomics, in both its development stages, has significantly influenced the formulation of the requirement for independency of the central bank. The important theoretical argument was the Lucas' interpretation of the Phillips which implies the non-existence of substitution relation between inflation and unemployment. According to Lucas, the economic subjects that create their expectations take into account all available information which can influence the given variable influence in the future so as to benefit as much as possible. On the basis of this fact, it is possible to suppose a correctness of their forecasts and non-recurrence of the systematic errors. The economic subjects try to include the information into their decisions, what is reflected by relative economic variables (wages and prices) and inflation. The representatives of the classical macroeconomics suppose that as a result of influence of market forces, economy generates, in the formation of the rational expectations, a natural rate of unemployment in the long term. The unemployment is (considering the unexpected changes of money supply) higher or lower in the short term than the natural rate of unemployment. If the central bank increases the aggregate demand by the monetary policy, the economic subjects will immediately adjust their rational expectations and take the expected rate of inflation into account by making the changes of prices and wages. Thus, the expected rate of inflation shall be the same as the real inflation rate. The real product and

unemployment rate remain unchanged. In the case of the rational expectation, there is no short-term Phillips curve (or it is the same with the long-term one). In this case, it is not possible to conclude a substitution relation between the inflation and unemployment rate (*Koderová, Sojka & Havel*, 2008; *Soukup*, 2007).

The argument of the independency of the central bank has been further supported by the matter of time inconsistency[124] of the discrete economy policy (Kydland and Prescott), which is generated by the reason that the creator of the monetary policy has a certain benefit from the strategy at which the announced procedure does not correspond with the procedure later really applied. So as to avoid this phenomenon (decreasing the economy performance), the economy policy must have the form of rules and to be as transparent as possible. The central bank must be independent so that not to be subject to political influences and the monetary policy is to be based on a simple and clear rule. The independent central bank would consistently use the given rule and not to deviate from it under any circumstances. Thus, the monetary policy would become sufficiently trustworthy and create the conditions for the formation of correct rational expectations in short as well as in long terms (*Koderová, Sojka & Havel*, 2008).

10.3.2 The position of the Central Bank and the role of the monetary policy from the point of view of the post-keynesian theory of the endogeneity of money

The post-Keynesian money theory has arisen in the 1970s as the critical response to the monetarist counterrevolution. At the turn of the 20th and 21st century, it was already developed in the form of the full-valued alternative of the monetarist theory of neoclassic as well as new Keynesian direction in the mainstream economy (*Sojka*, 2010).

The basis of the post-Keynesian money theory consists in the thesis there is no general theoretical model that can solve all economic problems for all historical periods and all situations. The significant role belongs, in this relation, to monetary institutions and their evolution. The development of institutions reflects the major characteristic features of money, since the monetary institutions and the banking ones are closely interconnected. In this relation, the role of credit is significant (money is credit-driven) and a demand determination of money (*Sojka*, 2002).

Money plays the significant stabilizing role in the post-Keynesian money theory as an instrument for overcoming the uncertainty. It is credit-driven and demand-determined. The thesis that money is determined by demand for credits means that, according to the post-Keynesians, the

[124]In general, time inconsistency in economy means a situation where the preferences change over time, i.e. the preferences of a politician at one point in time is inconsistent with he/she prefers at another point in time. A discrete decisions policy (the selection of the best decision in the given situation at correct assessment of status at the end of given period) does not lead to the optimization of a purpose-built function of the society. The reason of the paradox is the fact that the agents with rational expectations enter the game and that in that case there is no explicit manner of application of the management theory in economics. More exactly, the optimum management can be used only under the condition that only current and past policy is taken into account and the expectations of agents do not depend on future plans. It is possible to say that as a result of the fact that a politician feels a temptation to communicate the policy of monetary rule to public but to abandon it in the practice, the problem of time inconsistency and inflation deviation occurs. The solution of the problem of time inconsistency is to entrust an institution which works with longer time horizon than politicians and is not so exposed to similar problems and temptations to use the monetary policy for short-term influencing of real economic quantities with the implementation of the monetary policy. This institution shall be an independent central bank. Governor and members of the central bank management are usually appointed the periods that are longer than terms of office of politicians so as to be protected against possible political pressure and efforts to use the monetary policy for long-term political objectives.

demand for credits is the source of supply of money that is either, during the economic cycle, endogenously generated (during a conjuncture) or destroyed (during a recession). The thesis that money is credit-driven formulates the manner in which money is created by the process of credit creation in response to the development of the demand for credits incurred by the investment goals or by the increase of demand for working capital and destructed in the case of a decrease of the demand for credits. These create the basis of the theory of so called endogenous nature of money supply, according to which money is generated and destroyed as a response to the aggregate demand changes and related demand for credits. The basis of considering the endogenous money nature for the post-Keynesian economists was the thoughts of John Maynard Keynes developed in his work *Treatise on Money*, in which Keynes emphasizes the role of bank money, which has developed from money proper (Sojka, 2002; *Svoboda*, 2001). Theoretical working out of endogenous money within the post-Keynesian stream was comparatively careful, the empirical literature lacks. The most important contributions in this respect were from Lavoie, Fontana and Palacio-Vera, Arestis and Sawyer (*Korda*, 2010).

The theory of the endogenous money has considerable consequences for formulation of a monetary and credit policy as well as for the position of the central bank in the market capitalistic economy. In this concept, the money multiplier is not stable and causal relations are not directed unambiguously from the money basis to bank money (even the contrary relation is more important). Under these conditions, the central bank is not able to directly determine the amount of money in circulation, it is able, at the most, to influence it, however, the effectiveness of the monetary and credit policy is limited and has rather asymmetric consequences. The restrictive policy is usually more effective.

In the post-Keynesian view, the main goal of the central bank is not the currency stability, since the central bank is not able to enforce adequately this goal and its appropriate effectiveness in the battle against inflation is used to be paid by high price of a loss of macroeconomic performance.[125]. In this respect, the main problem is a fact that instruments, the central bank has at disposal are suitable for the battle against demand inflation only. Taking into account the fact that after the World War II the advanced capitalistic economies face predominantly cost inflation, this policy has very problematic impacts. In the post-Keynes concept, similarly as for the European version of new Keynesian economics (theoretical conceptions of so called negotiated economy), the income policy has become the effective instrument of the battle against the cost inflation. The role of the central bank consists in the attention paid to stability and sound development of the banking sector. The monetary and credit policy, as well as all administrative instruments used by the central bank to control the banking sector, would be as much as possible coordinated with other economic and political measures oriented to full employment (*Koderová, Sojka & Havel*, 2008).

According to current post-Keynesian authors of theory of relative money endogeneity (Dow, Rodríguez-Fuentes, Lavoie, Monvoison, Rochon, Palley and others) there is a certain interval of the credit creation. It is given by the conduct of the central bank and of the commercial banks. In this

[125] The key role of the monetary policy in the post-Keynesian theory is represented by control and supervision of the banking (more widely also financial) system. Post-Keynesians always draw the attention to the fact that the central bank is to fulfil especially its microeconomic function. This approach penetrates into the monetary policy. It is possible to observe in recent years that the central banks pay increased attention to stability of financial system in addition to inflation and economic growth.

approach, the central bank plays more active role in the existence of the endogenous nature of money supply as well. According to the supporters of this conception, the monetary policy does not include just quantitative (traditional) instruments (open-market operations, determination of obligatory reserves, discount rate and so on), but also qualitative (administrative) control instruments (bank control and supervision). According to their opinion, the significance of quantitative instruments is even decreasing and on the contrary, the role of administrative instruments in the stabilization of bank sector that have behavioral impacts on economic subjects increases (*Sojka*, 2010).

10.3.3 The position of the Central Bank and the role of monetary policy from the point of view of New Keynesian Economics ("New Consensus")

The new Keynesian economics has arisen during 20th century as a response to the emerging of neoconservative orientations (especially of the monetarism and new classical macroeconomics) and the crisis of neo-Keynesian macroeconomics (large neoclassical synthesis). In the area of the monetary policy and the theory of money, the theoretical conceptions become the basis of the "new consensus", which is the basis of the monetary policy focused to the inflation targeting. The changes of interest rates are, according to the theory, to provide non-inflation development of the aggregate demand, therefore it is possible to understand the inflation targeting also as the monetary policy of fine-tuning of the aggregate demand in the interest of reaching the determined inflation target. The given fine-tuning is based on the Phillips curve interpreted as a relation of the inflation and the production gap and including the inflation expectation. In a simplified fashion, the explanation of the new consensus can be interpreted as the model with three equations, by which it is possible to identify main differences between the new Keynesian theory of money and the post-Keynesian monetary theory of production. For the purpose of a simplification, the instants of time are provided. It is possible to encounter its various options. The following model describes the closed economy (*Koderová, Sojka & Havel*, 2008; *Sojka*, 2010).

Equation (10.1) is the equation of the aggregate demand, in which the output gap is given by the past and expected output gaps and real interest rate. It is based on the inverse-proportional relation of the aggregate demand and real interest rate (modified Fisher equation).

Equation (10.2) is an equivalent of the Phillips curve, in which the inflation is based on the common output gap and on the past and future inflation rate.

Equation (10.3) represents the central bank monetary policy rule (commonly used term for so called Taylor rule), in which the nominal interest rate is set as the response to deviation of inflation and product from their requested levels. In this equation, the creation of expectations is based on the rational expectations (*Sojka*, 2010) in the original versions of the "new consensus" (e.g. Clarida, Gall and Gertler, Taylor and others).

$$y^g = a_0 + a_1 y^g{}_{-1} + a_2 (E_t y^g{}_{+1}) - a_3 [i - E_t (\pi_{+1})] + s_1 \quad (10.1)$$

$$\pi = b_1 y^g + b_2 \pi_{-1} + b_3 E_t (\pi_{+1}) + s_2 \text{ (with } b_2 + b_3 = 1) \quad (10.2)$$

$$i = r_0 + E_t (\pi_{+1}) + c_1 y^g{}_{-1} + c_2 (\pi_{-1} - \pi^T) \quad (10.3)$$

where:

y^g - output gap,

i - nominal interest rate,

π - inflation rate,
π^T - inflation target,
r_0 - „equilibrium real interest rate", which is compatible with a zero output gap,
s_1, s_2 - stochastic shocks,
E_t - expectations in time t.

In the "new consensus" models, it is formally working with the cost-push inflation, but the conclusions for the monetary policy are made in such a way as only demand-pull inflation was relevant. The fact that money contained in them are not neutral in the short-time, is the result of small adjusting of nominal and real variables, what represents the characteristic feature of microeconomic bases of the new Keynesian economics. However, in the long term, the quantitative theory of money and resulting money neutrality remain valid. Actually, the inflation targeting supposes that low inflation rate is also harmful to economic development and that only very low inflation rate will provide the successful macroeconomic performance (the inflation rates amounted to 1 to 2% are regarded to be acceptable). According to new Keynesians, the introduction of the rule of monetary policy changes the behavior of the economic subjects (*Koderová, Sojka & Havel*, 2008).

In these models, there is no room for cost or wage inflation, despite the fact that the entire majority of inflation pressures after the World War II has been caused just by the increase of wage costs or oil prices and the demand inflation practically did not occur. The utilization of equilibrium real interest rate points out so called wicksell roots of the "new consensus" (*Koderová, Sojka & Havel*, 2008; *Korda*, 2010).

10.3.4 The European Central Bank, the example of its dual strategy

The European system of the central banks has two levels from the formal point of view, the European Central Bank and national central banks of particular Member States of the European Union. The statute of the European Central Bank and the European system of the central banks was established by the Treaty on European Union of 1992 and the Protocol on Statute of the European system of the central banks and the European Central Bank.

Thus, the European Central Bank became the component part of the specific legal and institutional framework of the European Community. The legislation, statutes and frameworks of the monetary policy of the American Federal reserve system and the German central banking based especially on the traditions of the German ordoliberalism become the source of inspiration of these documents. The European system of central banks has no legal personality (the legal entity is the European Central Bank and the national central banks), the participants of the monetary policy is the European Central Bank and the national central banks of the Euro area countries, which, on the basis of the Decision of the Board of Governors is called Eurosystem. The European Central Bank commenced its operation on July 1, 1998. The mandate of the central bank has also been influenced by the residues of the monetarism which could be found in the "new consensus" and its theoretical bases (*Sojka*, 2010).

Owing to these influences, the European Central Bank primarily focuses on the maintaining of the currency stability (Art. 105 of the Treaty and so called Maastricht criteria)[126]. While, it is based on the fact, that the European Central Bank can best contribute to "balanced and sustainable noninflationary growth" and "high level of employment" by monitoring of the monetary policy focused to the price stability. The ability of the monetary policy to ensure the price stability in the medium-term horizon is based on the dependency of the bank system on money issued by the central bank (identified as the "currency basis"), which is needed for:

- satisfaction of demand for money in circulation;
- settlement of interbank balances;
- keeping the obligatory minimum reserves at which their deposition in the central bank could be requested.

Taking into account the monopoly for the formation of the currency basis, the Eurosystem dominantly influences the conditions and interest rates at the money market. The changes of the interest rates on the money market produced by the central bank, initiated a whole series of mechanisms and reactions of economic subjects, which, in the upshot, influence the economic indicators, such as production or prices. This process is called as the "transmission mechanism of the monetary policy" (*Scheller*, 2006).

The European system of central Banks may support "general economy policies in the European Community with the intention to contribute to achieve the Community objectives" specified in the Treaty (economic and social advance, its balance and stability, improvement of economic and social cohesion, high level of employment).

According to *Scheller* (2006), there are three main political and economic reasons, why the function of the central bank for euro is held by the system of banks instead one central bank:

- establishment of one central bank for whole euro area (with the possibility to concentrate the functions of the central bank into one place) would be unacceptable by political reasons;
- conception of the Eurosystem is based on the skills of the national central banks, preserves their institutional arrangement, infrastructure and operating capacities and relies on their professional knowledge. In addition, the national central banks also performs the tasks, which do not directly relate to the Eurosystem;
- taking the expanse of the euro area into account, it was needed to enable the credit institutions to access the central bank in every participating Member State. Taking the fact into account that there are many countries and cultures in the euro area, the domestic institutions considered to be better access point to the Eurosystem than one multinational institution.

Based on the Treaty on European Union and the Statute of the European system of central banks and the European central bank, the European Central Bank fulfills the following basic tasks:

- forming and implementation of single monetary policy of the euro area;
- implementation of foreign-currency operations;

[126] Despite the fact that the Maastricht Treaty establishes unambiguously the main objective of the European Central Bank – maintaining of price stability – it did not define, what the price stability in fact means. Therefore, the Board of Governors of the European Central Bank has published a quantitative definition of price stability in October 1998 where it is defined as "interim increase of harmonized index of consumer prices (HICP) in the euro-currency area by less than 2%". At the same time it established that the price stability is "maintained in a medium-term horizon".

- holding and administration of official monetary reserves of the countries of the euro area;
- provision of continuous operation of payment systems;
- exclusive rights to permit the euro notes emissions;
- compilation of monetary and financial statistics;
- consulting activity for national central banks in the matters falling into its competence.

The Eurosystem is distinguished by high degree of independency (now probably highest degree of independency in the world). The European Central Bank as well as national central banks of the euro area are strictly protected against any political influence. The institutional independence of the European Central Bank from any influences (including influences from the part of governments) is guaranteed in Article 108 in the Treaty. This provision specifically provides that the European Central Bank or any member or his decision-making bodies will not ask for instructions or receive the instructions from other institutions or bodies of the Community, or from any government of a Member State or from any other body. The institutional independency of the European Central Bank is supplemented by its own legislation powers and consulting task at proposing the national legislation provisions.

According to the European Central Bank, money has a privileged role in its monetary policy. The decision to assign money the special position was based on the recognition of the fact that the money stock and inflation increases are closely related in the medium- and long-term horizons. The monetary and political strategy of the European Central Bank is based on two, mutually complementing analytical views, called pillars:

- economic analysis
  and
- monetary analysis.

Economic analysis (the first pillar) - for evaluation of short-term and medium-term factors of development emphasizing the real economic activity and terms of financing in the particular economies of the Union. This approach considers the fact that price development in these time horizons is influenced to considerable extent by mutual influencing of demand and offer on the market of goods, services and production factors.

Within the economic analysis, the European Central Bank periodically evaluates the following:

- development of total production;
- demand and conditions at the labor market;
- wide scope of price and cost indicators (e.g. influence of economic shocks on cost and price formation influence);
- fiscal policy;
- balance of payment of the euro area.

Also other indicators are monitored - the indicators of financial market, real estate prices, exchange rates of shares and movements of currency exchange rates. The macroeconomic projection elaborated by the Eurosystem's experts plays the important role in the economic analysis. The projections assist to classify and synthesize economic data with the aim to provide their consistency. In this respect, the projections have the key significance in specification of assessment of prospects of

economic development and short-term up to medium-term fluctuations of the inflation from its general trend.

Monetary analysis (second pillar) is focused on a long-term perspective and uses the long-term relation between money and prices. It is based on the assumptions that the inflation is a money phenomenon in the medium-term and long-term periods and the increase of money stock and inflation are closely interconnected in the medium-term and long-term horizon. The monetary analysis predominantly applies as the comparison device (from the part of development in the medium-term up to long-term horizon) of short-term up to medium-term indicators of the monetary policy resulting from the results of the economic analysis. It is focuses on the estimations of the money demand equations, real and nominal money gap, money overhang, utilization of money aggregates[127] as the advance indicators and their counter-entries. According to the research of the European Central Bank, the money aggregates include information about future price development. The subject of the analysis also includes the counterparties (counter-entries) M3, especially credits (*Iša*, 2008).

The aim of two-pillar approach is to ensure so that not to forget any relevant information in the risk assessment for price stability and to pay appropriate attention to various points of view and comparison of information, in the effort to come to general conclusion about the existence or risks for price stability. Two-pillar approach represents and appears to be as a system of diversified analysis, which is to provide, according to the European Central Bank, so as any relevant information to be omitted in the assessment of the risks influencing the inflation. The analysis of the development and mutual control of economic and monetary indicators (cross-check) is to provide the diversified analysis and to guarantee the consistency of the decision-making based on various analytical approaches.

10.4 Integration process of Slovakia into the European Monetary Union in perspective of selected macro-economic theories

The future of the national currencies of the European Union members is linked to the development of the European economy at present time. The single currency "Euro" (EUR) was introduced to world markets on January 1, 1999 and currently represents the main component of the Economic and Monetary Union (EMU) of the EU member states, the so-called Eurozone.

The single currency and Eurozone create many economic advantages for all economic subjects effective in member states of the EMU, but on the other hand, they represent considerable risks affecting macro-economic or micro-economic sphere. These risks are connected to the degree of preparedness of a new member to introduce the single currency and thus accept commitments arising from the membership in the Eurozone. The minimization of these risks is assisted by the high level of

[127] The key element of the monetary analysis is the analysis of money aggregate M3, which includes an amount of money in circulation, demand deposits, deposits with agreed maturity within two years including and deposits redeemable at notice up to three months including, repurchase agreements, units/shares of mutual funds of money market and debt debt securities with maturity within two years including. Selection of M3 aggregate is base on the evidences based by several empirical studies that just this aggregate fulfils the requirement of stable demand for money and is relevant indicator of future price development in the euro-area. The reference value of M3 growth was deduced in such a way so that to comply with reaching the price stability in the medium-term period and it was established on the level of 4.5%. A deduction of M3 is based on the quantitative equation of exchange (a change of money stock in economy (ΔM), inflation (ΔP), growth of real product (Δ YR) and velocity of money circulation (ΔV)). There was considered the growth rate of real GDP around 2 - 2.5%, the growth of price level below 2% and the decrease of money circulation velocity to 0.5 - 1% per year. The reference value is not the objective for M3 growth it should serve as equilibrium value of the growth of money aggregate and for identification of possible variations with possible risks influencing the development of inflation.

convergence of the economy of the country to the economy of countries of the Eurozone (*Lebiedzik, Tuleja & Pauhofová*, 2008).

The admission to the EU pushed the question of forming of the basic monetary and exchange framework into the forefront of economic and political decision-making in the transitive economies. The question of admission of candidate countries to the EMU is closely related to the future formation of the basic framework to sustain the macro-economic stability. With a high capital mobility and significantly limited conditions of execution of an independent interest policy, the decision on joining the euro is connected to accounting for potential consequence of relinquishing of the flexible exchange rate as a stabilizing instrument, e.g. for absorption of macro-economic shocks (*Mirdala*, 2008).

The admission of Slovakia into the Exchange Rate Mechanism (ERM II) in the late 2005 was perceived rather positively. It was mostly positively received by bank analysts, members of the Club 500 and then government officials. Entrepreneurs anticipated mostly the elimination of exchange rate risks and costs connected to insurance thereof as well as the reduction of costs of currency conversion. However, there were voices that pointed out that the accelerated admission to the ERM II was motivated more politically than economically. When discussing the admission to the Euro in Slovakia, the discussions usually narrowed down to whether Slovakia fulfills convergence criteria. A little attention was paid to their sustainable fulfillment, a sound concept of the optimum conversion rate of the Slovak crown was absent, even the key issue of the actual convergence was pushed to the background (*Iša & Okáli* , 2008).

The outbreak of the economic crisis in the end of 2008 significantly affected Slovakia and facilitated the emergence of a legitimate question whether the situation would be different in certain European economies if they were or were not members of the EMU at that time. The answer is not universally applicable to all countries of the EU that have not joined the single currency.

A reliable answer has to take into consideration possible advantages as well as disadvantages of such admission to the Eurozone with subsequent specifications of the monetary policy and its impact on the economy.

10.4.1 Impacts of the Eurozone admission

History shows that if the Slovak Republic wanted to join the single currency it had to fulfill the so-called Maastricht convergence criteria (the stability criterion, the long-term interest rate criterion, the public deficit criterion, the public debt criterion and national currency stability in the European Exchange Rate Mechanism ERMII criterion).

Concerning the joining of the single currency, the often-mentioned fact is the need to gain on the economic as well as price level of the developed member states of the EU prior to the admission to the Eurozone.

The economic level is the process of the actual convergence that is possible to acquire through a higher rate of the real GDP growth or the real valorization of the national currency, or the combination of both above-mentioned variables.

The price level is the process of the nominal convergence the country is possible to reach through two different methods, either through the nominal valorization of the national currency (the so called

exchange rate channel) or through a higher inflation of the national economy (the so called inflation channel), or through combination of both above-mentioned variables.

The inflation targeting with the flexible exchange rate is considered according to *Komárek et al.* (2010) as the most suitable and safest monetary-political regime for rapidly converging countries. Since if the real appreciation of the currency is administered exclusively through the channel of the higher inflation it results in low real interest rates, growth of inner and outer imbalance, which further results in a higher vulnerability of such a country during the time of crisis or turbulence. Other economic policies are overextended or are unable to balance this disequilibrium.

Each national economy anticipates mostly positive effects after joining the Euro. Positive expectations are logical, since every new country admitted to the EU pledges to join the Monetary Union and till the admission has the status of a member state with a temporal exemption for the joining of the Euro.

Slovakia joined the single currency on January 1, 2009. The admission of the Slovak Republic to the European Monetary Union resulted in termination of the national currency – the Slovak crown, which in principle resulted in the termination of the autonomous monetary policy. The loss of the autonomous monetary policy is a cost of a country's admission to the Monetary Union.

The passing of the monetary sovereignty by the admission of the EMU does not necessarily result in a heightened risk of the negative impact of macro-economic shocks on the progress of the output. The use of flexible exchange rates as a stabilizing mechanism for the absorption of negative impacts of macro-economic shocks is presented as less effective in the research of *Mirdala* (2008).

It is important to state that the admission to the Union and joining of the single currency has its benefits. One of the significantly positive effects is the elimination of risks of the exchange rate towards the Eurozone countries, which usually results in decreased transactional costs and lessening of the investment insecurity; another positive effect is the stabilization of the long-term interest rates on the lowest level and the access to more liquid Eurozone markets; the next important advantage is the heightened stability of the financial sector and lessening of risks of monetary turbulence; at last and in my opinion the most valuable advantage is the requirement to fulfill the demand of the balanced public budget, which at present represents one of the most important problems of the Eurozone countries.

The admission to the Monetary Union will always be accompanied by advantages and disadvantages. What will prevail in the time of the economic crisis cannot be generalized for each and every member state of the European Union, only time will show what represents an advantage (assets) and disadvantage (costs) for the Slovak Republic.

The existence of the single currency anticipates the unified monetary policy which direction is determined by the European System of Central Banks implemented by the European Central Bank in Frankfurt on the Main. Since national central banks are only implementing the policy of the European Central Bank, they are unable to lower interest rates during the time of crisis (recession) or raise these rates as an attempt to prevent inflation. As a supranational authority, the European Central Bank has to consider broad and wide-ranging objectives of the Monetary Union, the most important objective from the perspective of a national economy is to synchronize the national economic cycle with objectives of main trade partners in the Eurozone.

In case of such synchronization on the highest possible level, there is a high probability that objectives of the national economy will not be in contrast with the monetary policy of the European Central Bank.

10.4.2 Restrictions and obstacles of monetary policies

In the time of the current economic crisis, central banks lower their interest rates in an unprecedented extent, indicated by historical minimums (USA the level of 0 – 0.25 per cent) trusting that such inexpensive finances will lead to a higher lending which should result in higher spending and investments.

Main aims of the monetary policy are conflicting in a sense that the accomplishment of one prevents the accomplishment of another objective. The effort for the price stability in the time of a rapid economic growth or in the time of the economic crisis (recession) elicits the so-called central bank dilemma. This dilemma consists of the decision-making process and whether it will follow the stability of the money offer (the interest rate has to change) or the stability of the interest rate (the money offer has to change).

On the other hand, politicians as well as economic subjects ascribe a massive emphasis on effects of the monetary policy that not always fulfills these expectations. Among basic but fundamental restrictions of the monetary policy belong:

- The control of the amount of money in the economy is not an easy task (the control is not as accurate and finite because of the free movement of finances across borders and a relatively easy conversion from one national currency to other);
- Effects of changes in the discount rates have only anticipated and not absolutely certain impact, this being influenced by either pessimistic expectations (negative influence of the lowered interest rate) or positive expectations (weakening of absorbing influence of the heightened interest rate);
- The increasing of the interest rate (in order to confront the inflation pressure) usually results in the widening of the interest differential which leads to influx of speculative capital from foreign countries that depreciates the effort of the central bank in a restrictive monetary policy;
- The decreasing of the interest rate in order to stimulate investments can lead to reflux of the capital to foreign countries that depreciates the effort of the central bank in an expansive monetary policy;
- The self-financing of investments by companies also contributes to the weakening of the monetary policy with large companies usually self-financing their investments – i.e. out of the undivided profit resulting in the part of economy spraining free from the immediate influence of the monetary policy (in Czech, as well as in the Slovak Republic this factor was not very important in the latter years since companies do not dispose of large amounts of capital);
- The influence of the monetary policy have almost always delayed impact on the real product and employment/unemployment in the economy (2-18 months), which is a strong argument against the use of monetary instruments in the anti-cyclic policy.

The failure of the monetary policy in the time of recession can be imputed on one of the most probable scenarios, this being the lowering of interest rates to such an extent that they become

completely insensitive to heightening of the money supply which is in theory usually labeled as the so called "liquidity trap". In this situation, economic subjects are willing to sustain all finances until their real valorization or effective use. In such environment, the traditional expansive monetary policy is ineffective according to the economic theory.

In the last 30 years of the 20th century, the relatively strong position in the economic policy was held by monetarism. Currently, there is the view that precisely the effectively implemented monetarist experiment of the USA during 1979-1982 which main goal was to determine the stable growth of the money supply (the so called monetary rule) regardless of changeable conditions of economy undermined the very effectiveness of the monetarism in the future. The speed of money in circulation changed, thanks to the experiment, and became highly unstable till the point in the early 2000 when the Federal Reserve Fund in the USA ceased to implement "the monetary rule" for its monetary policy (since monetarism anticipates a constant level of speed of money circulation, which is unable to be ensured at present resulting in the shifting of the relatively compact theory into the sphere of dead ideas).

In spite of the above-mentioned restrictions, the monetary policy is in principle the primary instrument used in balancing economic cycles. The monetary policy uses other key macro-economic variables, e.g. the progress of real and nominal production (the real and nominal GDP), unemployment and the labor force indicator that significantly expose the state of the economy.

According to the macro-economic results, there is usually an illusion present that the membership in the Eurozone itself absorbs the progress of the global recession. The successfulness of the monetary policy in the solution of cyclic fluctuations of economy can encounter the above-mentioned restrictions and other obstacles whether it is the national central bank or the European Central Bank the one responsible for the monetary policy.

The admission to the Monetary Union will always be accompanied by discussions on advantages and disadvantages of such country's integration into the protection and monetary policy of the European Central Bank. What prevails in the time of the current economic crisis cannot be generalized and only time will show what formed an advantage (assets) and disadvantage (costs) for the Slovak Republic.

In favor of the membership in the Eurozone speaks the fact that all countries admitted had to rigidly fulfill the Maastricht Convergence Criteria leading to the medium-term guarantee of a healthy and long-term sustainable economy.

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Chapter 11

FORCED CHANGES IN BANKS FINANCING GROWTH IN EAST EUROPEAN COUNTRIES

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Abstract

The effects of the Great Recession so far had numerous negative consequences reflected primarily in strong recession and rising unemployment. They have varied from country to country and from region to region. The sample of the analyzed countries includes: the group of eight Central and East European (CEE-8) countries (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) and the group of eight South East European (SEE-8) countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYR Macedonia, Montenegro, Romania and Serbia). The experience during the Great Recession shows that excessive reliance on foreign capital inflows makes a country vulnerable. For CEE-8 and SEE-8 it is very important to increase domestic savings. Due to the lack of domestic sources of financing banks in CEE-8 and SEE-8 were faced with the following alternatives: to opt for the equity financing of their subsidiaries or for debt financing arrangements through cross-border credits (CBCs). Banks opted for CBCs, because it was not covered by the provision to deposit required reserves (RR). This also suited banks' head offices because, due to the crisis, they also had to consolidate their balances and ensure the appropriate level of capital adequacy.

The analyses show that CEE-8 and, in particular, SEE-8 are heavily dependent on the availability of foreign sources of finance. During the crisis lending interest rates (LIRs) in CEE-8 declined from 8.24% to 6.64% and in SEE-8 countries from 11.50% to 11.00%. In each group are five countries which succeeded in reducing LIRs during the crisis period and the two ones which increased them (Slovenia and Slovakia in CEE-8, and Serbia and Bosnia and Herzegovina in SEE-8. During the Great Recession, changes of LIRs were mostly influenced by credit risk, required reserves and withholding tax.

Keywords: *country risk, interest rate, foreign source of financing, European emerging markets*

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11.1 Introduction

The effects of the Great Recession affecting the world economy since 2008 have so far had numerous negative consequences reflected primarily in strong recession and rising unemployment. They have varied from country to country and from region to region.

In those processes, Central (CEE) and South East Europe (SEE), as the European emerging markets (EEM), have experienced very difficult times. Although CEE and SEE countries recorded a GDP growth of 3.56% during the analyzed period (2001-2011), their GDP declined by -0.72% during the crisis (2009-2011).

The sample of the analyzed countries includes two groups of countries: the group of eight Central and East European (CEE-8) countries (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) and the group of eight South East European (SEE-8) countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYR Macedonia, Montenegro, Romania and Serbia).

In these countries, during the analyzed period the level of gross national savings was about 15% of GDP on average, while the level of gross domestic savings was about 8% of GDP or, in other words, it was lower by about 7 percentage points (pp). Since CEE-8 and SEE-8 countries were trying to catch up with the EU, it was necessary to achieve high GDP growth rates and thus there was a pronounced need for investment. According to the IMF (2012) and UNCTAD (2011) data, the rate of capital formation in these countries was about 25-30% of GDP. Thus, the difference between available savings and investments had to be covered using foreign sources of finance, primarily the inflow of foreign direct investments (FDIs), cross-border credits (CBCs), portfolio investment (PIs) and workers' remittances (REMs).

Since both groups of countries relied on foreign sources of finance during the past decade, the aim of this chapter was to analyze the causes of changes of importance of various foreign sources of financing in the analyzed period. The need to analyze CBCs, in particular, was derived from the fact that they represented the largest source used by banks to grant credit (Savić, Barjaktarović and S. Konjikušić, 2012). In this regard, we will especially analyze the levels of deposit and lending interest rates, and their structures.

11.2 Literature review

The sudden stops of foreign capital inflow exposed these countries to the unexpected risks of asymmetric reduction in their access to credit and uneven availability of government policy and fiscal support during the crisis (Vujovic *et al.* 2011). According Josifidis *et al.* (2011), CEE countries with rigid exchange rate regimes (Baltic countries) were forced to accept internal devaluation, accompanied by significant output and employment losses. On the other hand, CEE countries with flexible regimes allowed significant currency depreciations, thus accepting the role of exchange rate as a shock absorber. Savić (2012) argued that the current economic crisis pointed to an even greater need to improve competitiveness on the road to increase employment and GDP per capita.

Allen and associates (2011) argued that the key benefit of CBCs was reflected in the effects of the diversification of bank assets, so that they were increasingly less exposed to country-specific

shocks. This also reduced the risks caused by non-performing loans (NPL). When domestic banks are hit by some shock, foreign bank presence can have a stabilizing effect on the credit market. All things considered, foreign banks and CBCs were the drivers of financial deepening and credit boom. CBCs in the euro zone amounted to €152 billion in 1999 and to €361 billion in 2006, thus accounting for about 5% of GDP in CBCs lender countries and for 10% of GDP in CBCs borrower countries.

Revoltella and Mucci (2011: 67-68) argued that the evolution of cross-border lending revealed that the group of countries characterized by a high degree of foreign ownership and presence of large international players, experienced a relatively higher stability of CBCS inflows relative to countries with a smaller presence of foreign banks (e.g. Russia, Turkey and Kazakhstan). It is an indirect proof that international banks generally do have a long-term horizon in funding their local CEE-8 and SEE-8 subsidiaries.

According to Calvo (2006: 2), the reason why banking crises have greater and more persistent effects on developing economies and countries in Eastern Europe lies in the fact that these countries are more vulnerable to a sudden stop of capital inflows.

Simor (2011: 27) gave evidence that the inflow of CBCs offered tremendous opportunities for Western banks to earn outstanding profits across Eastern Europe. During the period 2004-2008, the average ROE of banks in the EU was 15%; in some East European countries (the Czech Republic, Bulgaria, Estonia, Poland, Hungary, Latvia), it was higher than 20%, while in some other ones (Lithuania, Romania and Slovakia) it was higher than 15%.

According to Takáts (2010: 49-51), supply factors drove a fall in CBCs to emerging markets during the crisis. The demand for CBCs also declined, but it played a much smaller role. This contrasts to a much more balanced impact before the crisis. A 1% increase in output is associated with about 0.2% higher CBCs.

Countries that relied to a greater extent on external funding seemed to grow faster than other East European Countries. However, the crisis showed that countries with higher debt suffered much more severely during the crisis and that they would continue to do so after the crisis, as opposed to countries that had not built up such a large debt (Simor, 2011:29).

The experience during the Great Recession shows that excessive reliance on foreign capital inflows makes a country vulnerable. For CEE-8 and SEE-8 it is very important to increase domestic savings, reduce fiscal expenditures, eliminate crowding-out effects and deepen the domestic capital market, so that commercial banks can rely to a greater extent on long-term funding in local market.

Before the start of the Great Recession financial markets were characterized by the presence of strong CBC flows to Europe's emerging markets just due to the described lack of savings in those countries. When the crisis started in 2008, banks opted to a greater extent for an increase in deposit interest rates (DIRs) with a view to encouraging savings and collecting the greatest possible amount of deposits. However, since they were increasing DIRs, they were forced to increase lending interest rates (LIRs) as well. This increase in LIRs under crisis conditions, which implies a decrease in aggregate demand and lower capacity utilization, coupled with an increase in speculative investments, brought about an increase in non-performing loans (NPLs) and standard risk cost (SRC), which was also reflected in a decrease on the return on equity (ROE), coupled with an increase in the cost of income. The result was a significant aggravation of the performance of the banking industry. Since

such a situation was unsustainable, the banking industry nowadays embarks on the adjustment process by decreasing DIRs so as to confine the operating costs within long-term sustainable limits.

Due to the lack of domestic sources of development finance, banks in CEE-8 and SEE-8 were faced with the following decision alternatives: to opt for the equity financing of their subsidiaries or for debt financing arrangements through CBCs. Banks opted for the latter channel, through CBCs, because it was not covered by the provision to deposit required reserves. This also suited banks' head offices because, due to the crisis, they also had to consolidate their balances and ensure the appropriate level of capital adequacy.

Bearing all this in mind, we tested the following two hypotheses in our chapter:

H1: Due to insufficient savings, CEE-8 and SEE-8 were forced to attract the foreign sources of financing, including CBCs, and

H2: Apart from the EB, the levels of country risk (CR), required reserves (RR) and withholding tax (WHT) had the greatest influence on changing the sources of financing in CEE-8 and SEE-8.

11.3 Methodology

The sample of the analyzed EEM countries consists of eight Central and East European countries (CEE-8) and eight South East European countries (SEE-8). The data used in this chapter were taken from the World Bank, IMF, central banks of the observed countries, Euromoney, Bloomberg, Reuters and Deloitte. The following series were analyzed: lending interest rates (LIR), deposit interest rates (DIR), Euribor (EB) as the ECB refinancing rate - minimum bid rate which banks have to pay when they borrow money from the ECB, country risk (CR) - a collection of risks associated with investing in a foreign country, which include political risk, exchange rate risk, economic risk, sovereign risk and transfer risk (the risk of capital being locked up or frozen by government action), withholding tax (WHT) - tax paid directly to the government, and non-performing loans (NPL).

For purposes of this analysis the structure of CBC interest rates consists of the basic part (BP) and spread, i.e. credit margin (CM), which is the portion of the interest rate retained as profit by the CBC lender country:

$$LIR = BP + CM \tag{11.1}$$

The basic part (BP) consists of:

$$BP = EB + FS + CR \tag{11.2}$$

or, more precisely, the sum of the Euribor (EB), funding spread (FS), which represents the bank's profit from which the inflow of CBCs is generated, and country risk (CR) of the country for which CBCs are intended.

The credit margin (CM) consists of:

$$CM = WHT + RR + SRC + PM \tag{11.3}$$

or, more precisely, withholding tax (WHT), required reserves (RR), standard risk cost (SRC), which represents a cover for credit risk inside the borrower country, and profit margin (PM), which represents the profit of the bank in the borrower country which granted CBCs to a certain company.

Given such a structure, the break-even point of LIR for the bank is obtained by adding:

$$BEP = EB + FS + CR + WHT + RR \quad (11.4)$$

i.e. the Euribor, funding spread, country risk, withholding tax and required reserves. Should a portion of the standard risk cost of credit and profit margins be also covered, we find ourselves above the break-even point.

Different banks may apply different formulas to calculate their cost of funds, but it normally boils down to a weighted formula containing the borrowed funds and their independent rates. During the data collection process, the researchers were faced with some limitations, since it was often the question of banks' business policies, especially the funding spread and standard risk cost (SRC). In such circumstances, it was possible to precisely define EB and CR (from the basic part), and WHT and RR within the structure of LIRs. We did not disaggregate the remaining three elements of LIRs - funding spreads, standard risk cost and profit margin, since they form part of the business policy of each individual bank.

In this chapter we used the Pearson correlation to determine the significance of each component for the level of LIR. The Pearson correlation coefficient is calculated according to the following formula:

$$r = \frac{\sum_{i=1}^{N}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{N}(x_i - x)^2 \sum_{i=1}^{N}(y_i - \bar{y})^2}}$$

Elements of formula (Pearson correlation): N is the number of indicators in the relation; Xi stands for independent indicators and Yi for dependent indicators; ẋ and ẏ are the averages (of relevant indicators). SPPS software did calculations.

Explanation of Pearson correlation values:

+/-0 - +/- 0.2	no relation
+/-0.21 - +/- 0.4	weak relation
+/-0.41 - +/- 0.6	mid relation
+/-0.61 - +/- 0.8	strong relation
+/-0.81 - +/- 1	very strong relation

11.4 Empirical results

When analyzing the living standards of the population in CEE-8 and SEE-8 countries, expressed in terms of GDP per capita (in PPP), we determined that, in the period 2001-2011, CEE-8 countries recorded more dynamic growth (8.3%) than SEE countries (7.6%), achieving the average level of GDP per capita (in PPP) of $21,903 (CEE-8), as opposed to $11,585 (SEE-8) (see Figure

11.1 and Table 11.1). The level of GDP per capita (in PPP) achieved in CEE-8 countries is almost twice the level in SEE-8 countries.

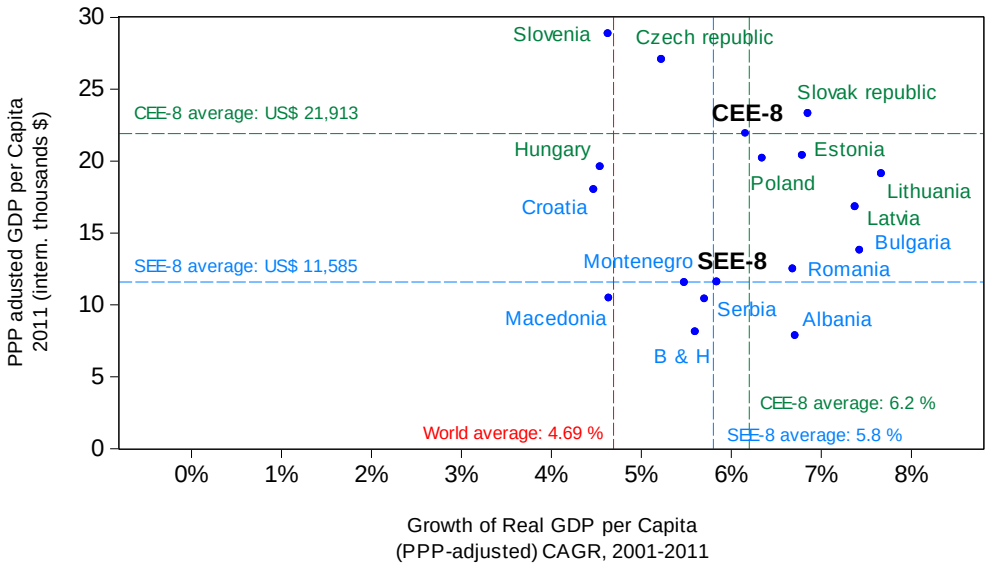

Figure 11.1 GDP per capita in CEE-8 and SEE-8

Source: N. Savic, G. Pitic and L. Barjaktarovic, FEFA © 2012

The bearers of prosperity among CEE-8 countries, which recorded the highest growth rates of GDP per capita (in PPP) during the analyzed period (2011-2011) included Lithuania (7.7%), Latvia (7.4%), Slovakia (6.9%), Estonia (6.8%) and Poland (6.3%). During the same period, the bearers of prosperity among SEE-8 countries included Bulgaria (7.4%), Albania and Romania (6.7%).

Table 11.1 GDP per capita growth rates (% in PPP)

	2001-2011	2001-2008	2009-2011
ALB	6.7%	7.6%	4.3%
BIH	5.6%	7.3%	1.3%
BGR	7.4%	9.7%	1.5%
CRO	4.5%	6.7%	-1.2%
MKD	4.6%	5.3%	2.9%
MNE	5.5%	6.7%	2.2%
ROU	6.7%	9.5%	-0.4%
SRB	5.7%	7.9%	0.2%
SEE-8	5.8%	7.6%	1.3%
CZE	5.2%	6.9%	0.8%
EST	6.8%	9.6%	-0.5%
HUN	4.5%	6.2%	0.3%
LVA	7.4%	10.4%	-0.4%
LTU	7.7%	10.8%	-0.2%
POL	6.3%	7.0%	4.7%
SVK	6.9%	8.7%	2.0%
SVN	4.6%	6.8%	-0.8%
CEE-8	6.2%	8.3%	0.7%

Source: Authors' recalculations based on WEO data base, IMF.

However, the situation changed with the outbreak of the crisis, namely during the period 2009-2011. The pace of GDP per capita (in PPP) growth changed and growth rates were dramatically reduced, while SEE-8 countries recorded a better pace (1.3%) than CEE-8 countries (0.7%). The adverse effect of the Great Recession is evident, although during the crisis, prosperity among SEE-8 countries was enhanced by Albania (4.3%), FYR Macedonia (2.9%) and Montenegro (2.2%), while among CEE-8 countries those were Poland (4.7%) and Slovakia (2.0%).

The described growth pace of GDP per capita (in PPP) shows clearly that all CEE-8 and SEE-8 countries are heavily dependent on foreign capital inflows and that during the crisis their growth was significantly slowed down due to reduced inflows of foreign financing. In some cases, the absolute level of GDP per capita (in PPP) in 2011 declined relative to 2008. Among CEE-8 countries this was recorded in Estonia, Latvia, Lithuania and Slovenia and among SEE-8 countries - in Croatia and Romania. As for Serbia, its growth is practically zero. To improve its competitiveness and prosperity and thus increase its GDP per capita (in PPP), every country must make significant investments. Table 11.2 shows total investments as a percentage of GDP.

Table 11.2 Total Investment (percent of GDP)

	2001-2011	2001-2008	2009-2011
ALB	28.0	28.6	26.6
BIH	24.5	26.3	19.5
BGR	26.4	26.9	25.1
CRO	26.7	27.9	23.5
MKD	n.a.	n.a.	n.a.
MNE	23.7	24.0	23.1
ROU	25.5	25.2	26.3
SRB	20.5	21.5	17.8
SEE-8	25.1	25.8	23.1
CZE	27.1	28.1	24.6
EST	30.1	33.5	21.0
HUN	22.7	24.3	18.5
LVA	29.3	32.1	22.0
LTU	21.5	23.8	15.2
POL	20.9	20.9	21.0
SVK	26.1	27.8	21.8
SVN	25.9	27.7	21.1
CEE-8	25.5	27.3	20.6

Source: Authors' recalculations based on WEO data base, IMF.

In the period 2001-2011, the investment rates in CEE-8 and SEE-8 countries were slightly above 25% of GDP (25.5% and 25.1%, respectively). However, these averages hide significant differences across countries. In the period up to 2008, investments in CEE-8 accounted for more than 27% of GDP, while investments in SEE-8 constituted nearly 26% of GDP. However, after 2008, a decrease in the investment rate became evident both in CEE-8 (20.6%) and SEE-8 (23.1%). As it could be seen, a slowdown in investment affected the pace of GDP per capita growth.

CEE-8 and CEE-8 countries are faced with the need to have large investments in order to catch up with the EU. However, they are unable to source more significant funds from domestic savings (see Table 11.3).

Table 11.3 Gross National Savings (percent of GDP)

	2001-2011	2001-2008	2009-2011
ALB	19.5	21.5	14.1
BIH	12.1	11.9	12.5
BGR	16.8	14.8	22.1
CRO	21.6	21.8	21.1
MKD	17.6	15.8	22.3
MNE	2.4	4.1	-2.3
ROU	18.4	17.0	22.0
SRB	10.4	10.7	9.8
SEE-8	14.8	14.7	15.2
CZE	23.5	24.2	21.5
EST	22.8	22.4	23.8
HUN	18.0	17.5	19.3
LVA	20.6	18.8	25.5
LTU	15.6	15.1	16.8
POL	16.3	16.7	15.4
SVK	20.3	20.7	19.3
SVN	24.2	25.5	20.7
CEE-8	20.2	20.1	20.3

Source: Authors' recalculations based on WEO data base, IMF.

The lack of domestic sources of financing and low domestic savings is more pronounced in SEE-8 relative to CEE-8. In SEE-8 countries the lack of domestic sources of financing amounts to about 10 percentage points due to which they were forced to rely on significant inflows of FDIs, CBCs and PIs. CEE-8 countries also face the lack of domestic sources for development finance. In these countries the gap is somewhat less pronounced than in SEE-8 countries, because they have higher savings rates. However, this is still insufficient to meet their investment needs.

An important conclusion that applies to both groups of countries is that they do not meet the requirements for so-called autochthonous development. This actually means that they are compelled to seek foreign sources of finance due to insufficient domestic savings as the source of financing so-called autochthonous development.

The previous analyses confirm the first hypothesis - according to which CEE-8 and, in particular, SEE-8 countries are heavily dependent on the availability of foreign sources of finance, since domestic savings are insufficient to achieve autochthonous development. This imposes the need to encourage savings as a long-term stable source of development finance.

The structures of DIRs and LIRs in 2008 and 2011 for a commercial bank which acquires its sources of funds through CBCs are shown in Figure 11.2. During the crisis, DIRs declined in CEE-8, while in SEE-8 they remained unchanged; the only exception was Serbia where DIRs were increased, although it already was at the top of this group of countries (due to a 9.80% increase, Serbia was immediately after Romania whose DIRs reached 10.0%). High DIRs (see Appendix Table 11.5) in

SEE-8 countries are the result of the efforts of their financial institutions to acquire the greatest possible amount of funds from domestic sources. On the other hand, this exerted influence on the level of LIRs. It can be observed that the situation in CEE-8 countries is quite different. With the exception of Hungary where DIRs are 7%, in all other countries DIRs are below 4%.

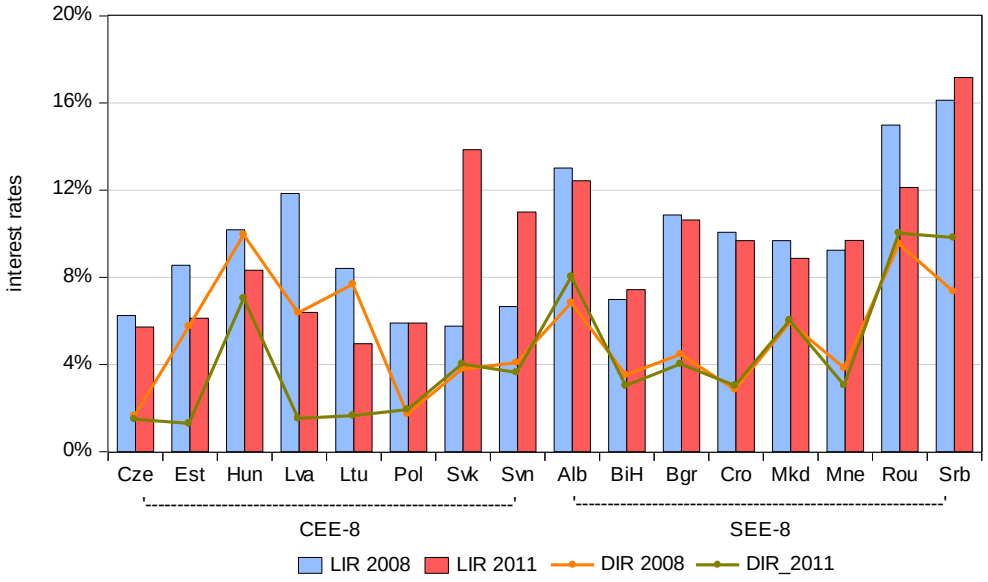

Figure 11.2 Lending and deposit interest rates in CEE-8 and SEE-8

Source: World Bank Database, World Bank

The next step was an analysis of the structure of LIRs so as to determine whether it would be possible to influence its reduction, thus making development finance based on foreign sources of financing cheaper.

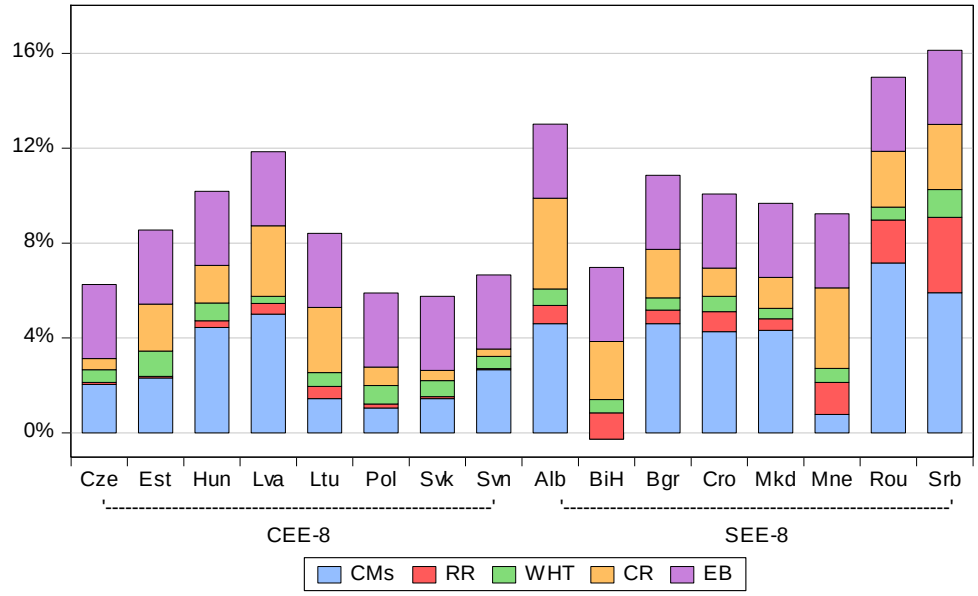

Figure 11.3 Lending interest rates in 2008

Source: N. Savic, G. Pitic and L. Barjaktarovic, FEFA © 2012

During the crisis, LIRs in CEE-8 countries declined from 8.24% to 6.64% and in SEE-8 countries from 11.50% to 11.00% (Appendix Table 11.6). The credit terms in CEE-8 countries are

more favorable than those in SEE-8 countries. During the crisis, the structure of LIRs underwent significant variation, which is shown in Figure 11.3 (2008) and Figure 11.4 (2011). In the basic part the greatest change occurred with respect to the Euribor, which declined from 3.132% in 2008 to 0.894% in 2011 (it is colored black on bars). This was the result of the ECB's efforts to encourage the exit from recession through its measures.

We already analyzed country risk on the basis of CDS (credit default swap) movements by country, which are published by Euromoney, Reuters and Bloomberg. CDS is a type of credit derivative whereby credit risk is undertaken as part of a swap transaction over a specified period of time, including appropriate pecuniary compensation. The crisis also influenced an increase in CR by more than 30 basic points (bp) in CEE-8 and SEE-8 countries. These averages hide great differences across countries, so that the highest CR ratings in 2011 among SEE-8 countries were assigned to Serbia (443 bp), Albania (383 bp) and Montenegro (340 bp) and among CEE-8 countries to Lithuania (356 bp), Hungary (268 bp) and Slovenia (256 bp).

In 2011, LIRs in SEE-8 countries were almost twice higher than in CEE-8 cuntries. In each group of these countries there are five countries which succeeded in reducing LIRs during the crisis period; by contrast, LIRs increased in Slovenia and Slovakia (CEE-8), and in Serbia and Bosnia and Herzegovina (SEE-8).

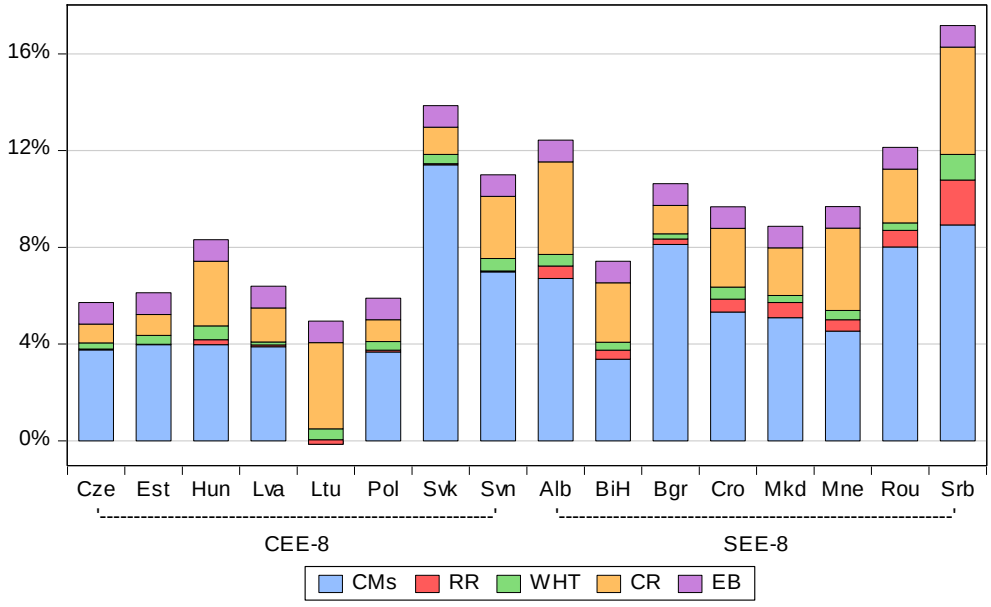

Figure 11.4 Lending interest rates in 2011

Source: N. Savic, G. Pitic and L. Barjaktarovic, FEFA © 2012

Good credit ratings, which are determined by credit rating agencies, have a great impact on attracting foreign investments to countries. This picture about a country and its banking system is transposed onto the end borrower (Jelenković and Barjaktarović, 2010).

In order to get a statistical relation between the level of interest rates and their components such as DIR, CR and other components of LIRs we applied the Pearson correlation. The results are presented in Table 11.4.

It is evident that there were not the same terms and conditions on financial market before the

crisis (2008) and after the first wave of crisis (2011). There is also a different influence of the IR components in CEE–8 and SEE–8 countries in the same period of time.

In 2008, EBs did not have an impact on LIRs. CRs did not have an impact on LIRs in CEE–8, but had a mid-relation with LIRs in SEE–8. Other components had a strong relation with LIRs in CEE–8 and SEE-8.

In 2011, EB had a very strong relation with LIR in CEE–8 and SEE-8. The importance of CR increased during the crisis in the LIR structure of CEE–8 countries (mid relation), while in SEE–8 there was no relation between CR and LIR. Other components had a weak relation with LIR in CEE–8, while in SEE–8 there were strong relation between RR and WHT with LIR in SEE-8 countries.

Table 11.4 Correlations of LIR components in CEE-8 and SEE-8 in 2008 and 2011

	CEE-8			SEE-8		
	LIR	1m EB	CR	LIR	1m EB	CR
1m EB	0.069 0.799			0.052 0.850		
CR	0.049 0.857	-0.010 0.970		0.446 0.083	-0.171 0.526	
WHT	-0.653 0.285	0	-0.639 -0.426	0.513 0.742	0	-0.154 0.516
RR	0.634 -0.313	0	0.785 0.468	0.665 0.777	0	0.138 0.343

Source: Authors' calculations.

LIRs are strongly determined by CR, RR and WHT, which proves the second hypothesis of the work. The volume and pricing of deposits are also important for the value of LIRs. The crisis has confirmed that collecting deposits on the domestic financial market is the most reliable source of financing to banks.

11.4 Conclusion

The experience during the Great Recession shows that excessive reliance on foreign capital inflows makes a country vulnerable. For CEE-8 and SEE-8 it is very important to increase domestic savings, reduce fiscal expenditures, eliminate crowding-out effects and deepen the domestic capital market, so that commercial banks can rely to a greater extent on long-term funding in local currency. Due to the lack of domestic sources of development finance, banks in CEE-8 and SEE-8 were faced with the following decision alternatives: to opt for the equity financing of their subsidiaries or for debt financing arrangements through CBCs. More attractive was channel through CBCs because it was not covered by the provision to deposit required reserves. This also suited banks' head offices because, due to the crisis, they also had to consolidate their balances and ensure the appropriate level of capital adequacy.

The analysis show that CEE-8 and, in particular, SEE-8 are heavily dependent on the availability of foreign sources of financing, since domestic savings are insufficient to achieve autochthonous development. This imposes the need to encourage savings as a long-term stable source of development finance. During the crisis, LIRs in CEE-8 countries declined from 8.24% to 6.64% and in SEE-8 countries from 11.50% to 11.00%. In each group of these countries there are five

countries which succeeded in reducing LIRs during the crisis period; by contrast, LIRs increased in Slovenia and Slovakia (CEE-8), and in Serbia and Bosnia and Herzegovina (SEE-8). During the Great Recession, changes of LIRs were mostly influenced by credit risk, required reserves and withholding tax.

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APPENDIX

Table 11.5 Deposit interest rates (%)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
ALB	8.30	7.73	8.54	8.38	6.61	5.09	5.23	5.66	6.80	6.77	6.42	8.00
BIH	14.67	n.a.	4.53	4.03	3.72	3.56	3.69	3.56	3.49	3.60	3.16	3.00
BGR	3.10	2.92	2.80	2.93	3.05	3.08	3.17	3.68	4.44	6.18	4.08	4.00
CRO	3.74	3.23	1.89	1.53	1.87	1.71	1.72	2.34	2.82	3.20	1.76	3.00
MKD	11.18	9.97	9.56	7.97	6.54	5.23	4.66	4.88	5.89	7.05	7.07	6.00
MNE	n.a.	n.a.	n.a.	n.a.	4.87	4.84	5.06	5.08	3.82	3.81	3.70	3.02
ROU	33.11	26.87	19.23	11.02	11.54	6.42	4.77	6.70	9.51	11.99	7.31	10.0
SRB	78.70	4.10	2.62	2.74	3.60	3.71	5.06	4.08	7.32	5.06	11.33	9.80
SEE-8	21.83	9.14	7.02	5.51	5.22	4.21	4.17	4.50	5.51	5.96	5.60	5.85
CZE	3.42	2.87	2.00	1.33	1.28	1.17	1.19	1.32	1.61	1.27	1.08	1.46
EST	3.76	4.03	2.74	2.40	2.16	2.13	2.84	4.37	5.72	4.82	1.11	1.27
HUN	9.49	8.40	7.41	10.98	9.09	5.17	7.45	6.81	9.92	5.82	4.92	7.00
LVA	4.38	5.24	3.23	3.02	3.27	2.78	3.53	6.06	6.34	8.04	1.87	1.50
LTU	3.86	3.00	1.70	1.27	1.22	2.40	2.97	5.40	7.65	4.81	n.a.	1.62
POL	14.17	11.80	6.21	3.71	3.75	2.79	2.20	n.a.	1.70	n.a.	n.a.	1.90
SVK	8.45	6.46	6.65	5.33	4.14	2.44	3.57	3.72	3.76	n.a.	n.a.	4.00
SVN	10.05	9.81	8.24	5.95	3.82	3.18	2.80	3.60	4.05	1.40	n.a.	3.60
CEE-8	7.20	6.45	4.77	4.25	3.59	2.76	3.32	4.47	5.58	4.36	2.24	2.79

Source: Authors' recalculations based on World Bank data base, The World Bank.

Table 11.6 Lending interest rates

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
ALB	22.10	19.65	15.30	14.27	11.76	13.08	12.94	14.10	13.02	12.66	12.82	12.43
BIH	30.50		12.70	10.87	10.28	9.61	8.01	7.17	6.98	7.93	7.89	7.43
BGR	11.34	11.11	9.21	8.54	8.87	8.66	8.89	10.00	10.86	11.34	11.14	10.63
HRV	12.07	9.55	12.84	11.58	11.75	11.19	9.93	9.33	10.07	11.55	10.38	9.68
MKD	18.93	19.35	18.36	16.00	12.44	12.13	11.29	10.23	9.68	10.07	9.48	8.87
MNE							11.15	9.20	9.24	9.36	9.53	9.69
ROU	53.85	45.40	35.43	25.44	25.61	19.60	13.98	13.35	14.99	17.28	14.07	12.13
SRB	6.30	34.50	19.71	15.48	15.53	16.83	16.56	11.13	16.13	11.78	17.30	17.17
	22.16	23.26	17.65	14.60	13.75	13.02	11.60	10.56	11.37	11.50	11.58	11.00
CZE	7.16	7.20	6.72	5.95	6.03	5.78	5.59	5.79	6.25	5.99	5.89	5.72
EST	7.43	7.78	6.70	5.51	5.66	4.93	5.03	6.46	8.55	9.39	7.76	6.12
HUN	12.60	12.12	10.17	9.60	12.82	8.54	8.08	9.09	10.18	11.04	7.59	8.32
LVA	11.87	11.17	7.97	5.38	7.45	6.11	7.29	10.91	11.85	16.23	9.56	6.39
LTU	12.14	9.63	6.84	5.84	5.74	5.27	5.11	6.86	8.41	8.39	5.99	4.95
POL	20.01	18.36	12.03	7.30	7.56	6.83	5.48	n.a.	5.90	n.a.	n.a.	5.90
SVK	14.89	11.24	10.25	8.46	9.07	6.68	7.67	7.99	5.76	n.a.	n.a.	13.86
SVN	15.77	15.05	13.17	10.75	8.65	7.80	7.41	5.91	6.66	5.95	n.a.	11,00
	12.73	11.57	9.23	7.35	7.87	6.49	6.46	7.57	8.24	9.50	7.36	6.64

Source: Authors' recalculations based on World Bank data base, The World Bank.

Table 11.7 Banking sector NPLs in CEE

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
EU	3.8	2.8	2.9	2.6	2.3	2.1	2.0	1.8	2.6	4.5	5.6	6.1
MIC	11.3	11.5	11.4	8.4	6.9	5.2	3.7	3.0	3.8	5.1	3.9	3.3
WLD	9.5	8.5	8.0	6.3	4.2	3.5	3.1	2.7	3.0	4.2	4.0	
ALB				4.6	4.2	2.3	3.1	3.4	6.6	10.5	13.9	14.4
BIH	9.9	5.9	11.0	8.4	6.1	5.3	4.0	3.0	3.1	5.9	11.4	11.7
BGR	17.3	3.3	2.6	3.2	2.0	2.2	2.2	2.1	2.5	6.4	11.9	13.5
CRO	9.5	7.3	10.2	8.9	7.5	6.2	5.2	4.8	4.9	7.8	11.2	11.5
MKD			23.1	22.4	17.0	15.0	11.2	7.5	6.7	8.9	9.0	9.1
MNE					5.2	5.3	2.9	3.2	7.2	13.5	21.0	
ROU		3.3		8.3	8.1	2.6	1.8	2.6	2.8	7.9	11.9	13.4
SRB			21.6	24.1	22.2				11.3	15.5	16.9	18.6
SEE-8	12.2	5.0	13.7	12.6	9.7	6.1	4.6	3.9	5.5	9.4	13.3	13.0
CZE	29.3	13.7	8.1	4.9	4.0	3.9	3.6	2.7	3.2	5.2	6.2	5.6
EST	1.0	1.3	0.8	0.4	0.3	0.2	0.2	0.5	1.9	5.2	5.4	5.2
HUN	3.0	2.7	2.9	2.6	2.7	2.3	2.6	2.3	3.0	6.7	9.7	10.4
LVA	4.6	2.8	2.0	1.4	1.1	0.7	0.5	0.8	3.6	16.4	19.0	18.4
LTU	11.3	6.7	5.3	2.4	2.2	0.6	1.0	1.0	4.6	19.3	19.7	19.1
POL	15.5		21.1	21.2	14.9	11.0	7.4	5.2	4.5	8.0	8.8	8.4
SVK	13.7	11.1	7.9	3.7	2.6	5.0	3.2	2.5	2.5	5.3	5.8	5.8
SVN	6.5	7.0	7.0	3.7	3.0	2.5	2.5	1.8	1.8	2.3	3.6	
CEE-8	7.9	5.3	6.7	5.1	3.8	3.2	2.5	2.0	3.1	9.0	10.3	11.2

Source: Authors' recalculations based on World Bank data base, The World Bank.

Chapter 12

FISCAL POLICY AND EXTERNAL CONSTRAINT IN THE EUROPEAN MONETARY UNION

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FISCAL POLICY AND EXTERNAL CONSTRAINT IN THE EUROPEAN MONETARY UNION

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Abstract

The European policy model was built upon the idea that state intervention has just a destabilizing role. The chapter puts in doubt this conclusion and connects fiscal crises with the balance of payments. A stylized model is presented. Its results are: 1) public expenditure can have positive effects not only on growth but also on deficit and debt if it is not accompanied by an a interest rate increase by the Central Bank; 2) when an external constraint is introduced fiscal policy can have negative effects if it comes with a balance of payment deficit. The same negative effects result from whatever shock causing negative expectation about the future growth of the national economy. The results suggest that to make a currency union work it is necessary to overcome national boundaries.

Keywords: fiscal policy, debt crisis, European Monetary Union.

12.1 Introduction

The creation of the European Monetary Union has deeply changed how economic policy is managed. The main idea is that monetary policies can be efficient only if there are rigid rules in single state interventions. The result is a subordination of fiscal policies to the *wider* objective of the stability of the Euro. This stability has been considered the necessary condition for long-run convergence towards the natural unemployment rate.

However the existence of divergences in growth rates after the shock of crisis, has dramatically shown the trade-off - at least in the short run - between the reduction in public expenditure and the interventions required to sustain income. Mainstream economists assert that there is a single strategy to reach both goals: the free operating of market forces, which, in the long run, lead to steady growth, national convergence and sound public budgets.

The theoretical underpinnings of this conclusion can be generally referred to the limits of discretionary policies and to the phenomenon of time inconsistency (Kydland and Prescott 1977) both in the field of monetary and fiscal policy. In fact - following the rational expectation hypothesis - "only unanticipated money matters" (Lucas 1972, Sargent and Wallace 1975) and therefore the monetary policy cannot have any active role in stabilizing output.

In the field of fiscal policy Barro (1974) demonstrated that public expenditure just creates expectations for greater future taxation and public debt. The intertemporal equilibrium between present and future consumption - the so-called Ricardian equivalence - tells us that there will be no increase in demand following the greater public deficit.

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These analytical conclusions have been reinforced by studies underlining the immoral behaviour of politicians. Their rarely aim to serve the public interest, but often just to be re-elected: therefore they subordinate decisions on the optimal policy to the consensus mechanism (for example Buckanan and Tullok 1962)[132].

These theoretical results have widely contributed to form what has been called "macroeconomic consensus" (see for example Arestis and Sawyer 2003 and 2005 and Arestis, McCauley and Sawyer 2001) upon which the economic and monetary union has been based.

According to this "macroeconomic consensus":

- short-term policies are not desirable because even if they could have positive effects in the short-run, the final result is just an increase of inflation;
- inflation is a monetary phenomenon. It is possible to control the quantity of money in circulation to control the inflation rate;
- gross domestic product and unemployment fluctuate around their long run value. This last one is independent from active fiscal and monetary policies;

These principles are the theoretical foundation of economic policy in Europe, whose general content is to assure that monetary variables do not alter the spontaneous convergence toward the NAIRU and to help the European Central Bank to reach the task of price stability.

However, in current recessive conditions, these constraints are likely to be counterproductive: national governments in EMU are obliged to respect rigid parameters and cannot use fiscal policy to off-set real effects coming from the crisis: deficit spending and public debt are now a policy objective rather than a policy instrument.

A huge amount of literature has been written to criticize the architecture of economic policy in Europe[133]. The common ground of it is that equilibrium income and employment is not just supply-side determined[134]. In the light of current crisis the debate has received a renewed interest, the active role of fiscal policy has been recuperated (De Long 2012, Batini, Callegari and Melina 2012) and the positive effects of austerity have been questioned (for a review of the debate in Europe see Corsetti 2012).

Beside the limits imposed to fiscal policy, the European Union shows a further flaw economists have been assigning an increasing attention: the asymmetries in the balance of payments disequilibria. Countries in difficulty are experiencing an ever increasing deficit in current account accompanied by sharp capital out-flows while virtuous countries are experiencing the opposite.

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[132] These results have been questioned and some economists have shown, also empirically, that monetary policy can be effective to reduce unemployment, without leading to higher inflation. A review of the empirical literature on the multiplier value is in Canale et al. (2008). The debate has been prompted further till to consider the expansionary effects of fiscal contraction, for opposite positions see Perotti (2011) and Alesina and Ardagna (2012). Therefore the question whether fiscal expansion increases or decreases growth did not find an univocal empirical support.

[133] A big group of economists – European economists for an alternative economic policy in Europe - each year writes down a memorandum to summarize the contents of the alterative economic policy and to collect new consensus around it. See for instance Euromemorandum Group (2012) See also Fitoussi and Saraceno (2004). Many critiques can be found on also on a special number of Oxford Review of Economic Policy (vol.21 n°4, 2005) entirely dedicated to the macroeconomic role of fiscal policy. See in particular Allsopp and Vines (2005), Krugmann (2005), Solow (2005).

[134] The NAIRU (non accelerate inflation rate of unemployment) is generally viewed as supply-side determined equilibrium rate of unemployment. In most presentations of the NAIRU, aggregate demand plays no essential role in the determination of such an equilibrium rate of unemployment. In those macroeconomic models from which a NAIRU is derived as an appearance, the nature of the models is such that the level of aggregate demand has to adjust to the level of unemployment as set by the supply-side factors" Sawyer (2002).

The reduction of liquidity resulting from this mechanism increases interest rates and provokes, in times of crisis, a downward spiral of GDP reduction and unsound public finance.

Fiscal policy necessary to counteract the effect of crisis can be considered to be effective as soon as the country belonging to EMU is not external constrained. The effects on interest rates of the balance of payments deficit crowds out fiscal policy and forces governments to reduce public expenditure and liquidity needs.

The chapter is organized as follows: the second paragraph refers about the theory of the inefficacy of fiscal policy; the third paragraph contains the issues about the relation of fiscal policy with the external balance with particular attention to EMU. The fourth paragraph presents a stylized model about the efficacy of fiscal policy in EMU countries and the eventual presence of an external constraint. As first step the efficacy of fiscal policy is evaluated as a policy instrument: state intervention can have positive effects not only on growth but also on deficit and debt if it is not accompanied by an a interest rate increase by the Central Bank. In a second stage an external constraint is introduced defined as the single country balance of payment equilibrium: fiscal policy can have negative effects if it comes with a balance of payment deficit. The final section concludes underlying the fact that to make the currency union work it is necessary to overcome national boundaries.

12.2 Does deficit spending increase growth?

The ineffectiveness of economic policy in changing the value of equilibrium income has been widely maintained in the economic literature: the intervention of fiscal authorities through deficit spending increases debt and inflation without affecting growth. This conclusion is based on three main pillars:

1) The crowding-out effect
2) The inflationary effect
3) The Ricardian equivalence extended to the non-Keynesian effects of Keynesian policies

As regards these effects on the macroeconomic equilibrium, the mainstream literature starts from a full employment equilibrium and concludes that monetary and fiscal policies only affect prices. Therefore the first general limit to be noted is that what has still to be proved is assumed as a hypothesis[135]. Indeed, if we remove the hypothesis that the starting point is the full employment equilibrium, the effects of policy intervention listed above become very weak and uncertain.

Let us examine them one by one.

1) *The crowding-out effect*

In a monetary union, the single states lose their control on monetary policy and are forced to finance public deficits through the emission of public debt. To convince the public to buy these bonds it is necessary to raise interest rates. The increase in interest rates crowds out private investment, and causes a reduction in the equilibrium income. The final result is a total or partial offsetting of the effects of the increase in public expenditure.

[135]Arestis and Sawyer (2003).

However market interest rates have as reference value the interest rates the Central bank sets so that the higher cost of refinancing the deficit with additional debt largely depends on the action of monetary policy.

In a Monetary Union, consisting of many countries with different economic weights and perceived risk could happen two further circumstances: 1) a first, during normal times, in which deficit spending in one country does not necessarily trigger a reaction of the monetary authority due to the absence of effects on inflation in the whole area and 2) a second in which, in times of crisis, single countries are subject to the external constraint of the balance of payments. In this case the crowding-out effect is determined by capital outflows: private investors request for an ever-increasing return to finance the additional debt entangling national countries, without autonomous monetary policy instruments, in a self-fulfilling process of GDP reduction and interest rates increase.

2) *the inflationary effects* of public expenditure.

Public expenditure is said to cause inflation because of its effect on aggregate internal consumption and absorption. Indeed, the injection of additional resources in the system causes an increase in private demand for both domestic goods and foreign ones. By increasing the demand for domestic goods, public expenditure directly increases internal prices and increasing demand for foreign goods imports inflation and worsens the current account balance. If the exchange rate is flexible, the second effect disappears in the long run due to both the direct increase in foreign prices and the increase in the relative prices of currencies.

However, the first effect is of major importance and requires deeper reflection. In order to state that an increase in demand causes an increase in prices - even accepting the perfect flexibility of money values - we have to formulate some additional hypotheses: a) the supply curve has a positive slope or is vertical and if so b) the increase in public expenditure does not cause a shift in the supply curve as well.

In time of crisis, the supply curve is neither positive sloped nor vertical but rather horizontal[136]: in the presence of unemployment, firms can employ the quantity of labour they want at the current wage. The average cost of production is therefore constant, as are the prices following the mark-up mechanism. Under these circumstances, inflation derives from institutional mechanisms of bargaining in the labour market, where wages and prices compete to distribute income in the way labourers and firms prefer. The potential inflationary effects of deficit spending could, in this way, become null.

3) *Ricardian equivalence*

Robert Barro, revisiting Ricardian conclusions about the intertemporal equilibrium between income and expenditure, have postulated that public expenditure in the present causes expectation of greater taxation, higher interest rates and greater public debt. These expected effects reduce current consumption, offsetting the increase in income generated by the increase in autonomous demand. In other words, in order to avoid the future decrease in consumption caused by a very probable increase in taxation and interest rates, consumers and firms save more and reduce their expenditure in the present. In the light of such argumentation, public intervention would be useless and devoid of any stabilising role.

[136] See DeLong and Summers (2012) and Batini, Callegari and Melina (2012)

Despite the extensive empirical literature on the subject, an unambiguous conclusion has not yet been found. Indeed, there are many shortcomings to be considered in this intertemporal equilibrium. The first is that life in a long-term horizon is uncertain and people may be influenced in their expenditure decision by the desire to satisfy an immediate need or *pleasure*. Secondly, due to life's uncertainties they might decide not to behave altruistically and shift onto future generations the burden of a greater present public debt. Thirdly, public debt could have wealth effects, thereby offsetting the expected reduction in disposable income.

Finally - in conditions of underemployment, when it is not possible to choose whether or not to work and therefore whether or not to increase consumption - the present expenditure could cause an increase in equilibrium income and thus an increase in tax flow without the need to increase the share of fiscal incomings as well. In recent times contributions states that the value of the income multiplier in times of crisis is positive and high (Batini, Callegari and Melina 2012 and Farhi Werning 2012).

12.3 Theoretical issues about fiscal policy and external balance: the special case of the Euro

The identities of national accounts state that the sum of private $(Y-C=S_p)$ and $(T-G=-D)$ public saving equals investments (I) plus the net value of current account (CA):

$$(Y-C)+(T-G)=I+CA$$

or

$$S_p-D=I+CA$$

So that the current account deficit covers the difference between saving (public and private) and investment.

According to the intertemporal approach to the balance of payments (Obstfeld and Rogoff 1995 which represent an extension of the Ricardian equivalence to the external balance) the external debt financed consumption today is the substitute of a current account surplus in the future. Under the rational expectation hypothesis debt or tax financed deficit spending does not alter the current account intertemporal path. Budget deficit could alter the intertemporal internal and external equilibrium if there is a lack of information about the future trend of the national economy. The increase in interest rates is therefore caused by an excess of debt that cannot be financed by internal saving.

On the other side there is the twin deficit hypothesis, related to the Keynesian framework: an increase in the budget deficit would induce domestic absorption (an expansion of aggregated demand) and hence, an increase in imports, causing a worsening of the current account deficit. Along the Keynesian framework also the reverse causality works: a lost of competitiveness worsens current account and reduces aggregate demand, increasing the needs for deficit spending and the amount of debt issued. This would alter interest rates and cause a further deterioration of the external position.

This twin deficit issue is also related to the degree of international capital mobility and to the Feldstein and Horioka (1980) puzzle according to which domestic savings and domestic investments are highly uncorrelated. Reflecting high capital mobility, budget and current account deficits are

therefore expected to move together, and it is not possible to define univocally the direction of causality.

As a matter of fact the difference between saving and investment can be financed through the inflow of capital as the balance of payment account states. In particular, under a pure floating exchange rates regime, the relative price of currency automatically puts the balance of payments in equilibrium so that:

$$BP = CA + MC = 0$$

While under fixed exchange rate regimes it holds:

$$BP = CA + MC = \Delta RU$$

It means that the decrease (increase) in foreign reserve currency covers the current account deficit (surplus) private capital does not finance. As a huge amount of literature states, a currency crisis occurs when foreign reserves exhaust (first generation models) and the monetary policy attempt to attract capital via interest rates increase becomes too costly for the internal equilibrium (second and third generation models).

The Eurosystem is comparable to a fixed exchange rate regime. However because the currency is the same there is a settlements mechanism called TARGET (evolved in recent times in TARGET2), as an alternative to the variation of foreign exchange reserves. Following TARGET2 countries with a balance of payment surplus receive, via their national central bank, the net credit coming from balance of payment deficit countries. Deficit countries, in turn, have a net debt with surplus countries whose cost is determined by interest rates ECB sets with the European Banking system. Before the 2007 financial crisis it worked as a settlement mechanism among Euro area banks, in a perfectly integrated capital market. As the framework of the Mundell-Fleming model describes, capital flew from one country to another according to interest rates differential, under the umbrella of trust in the common currency. Until the 2007 financial crisis, the difference between saving and investment was considered a good opportunity for capitals coming from surplus countries and going toward deficit ones to gain additional returns. In other terms the current account imbalances were considered to be a predictor of a uniform rate of growth (Blanchard and Giavazzi 2004). Public bonds were not considered risky and the spread were absolutely negligible.

Figure 12.1 depicts the relation between the average values 2004-2007 of ten years government bond yields and current account position as a percentage of GDP for countries considered relevant for the imbalances: Portugal, Ireland, Italy, Greece and Spain (PIIGS) for vicious ones, Finland, Germany, Netherland and Austria as representative of virtuous countries; France and Belgium as borderline.

The range of long term government bond yields is between 3.85 and 4.1 percent while the current account varies from +8% to -10%. The intuition associated with figure 1 suggests that there is not any explicit relation between long term interest rates and current account

Once the crisis hit the aggregate demand and revealed the lack of structural differences among euro-zone countries the value of current account became the proxy for financial markets to evaluate the ability to repay the debts. The direction of causality reverted: countries experiencing

current account deficit had outflows of capital and increase in interest rates. The resulting real effects further boosted capital flight and entangled countries in a self-fulfilling process of downward growth.

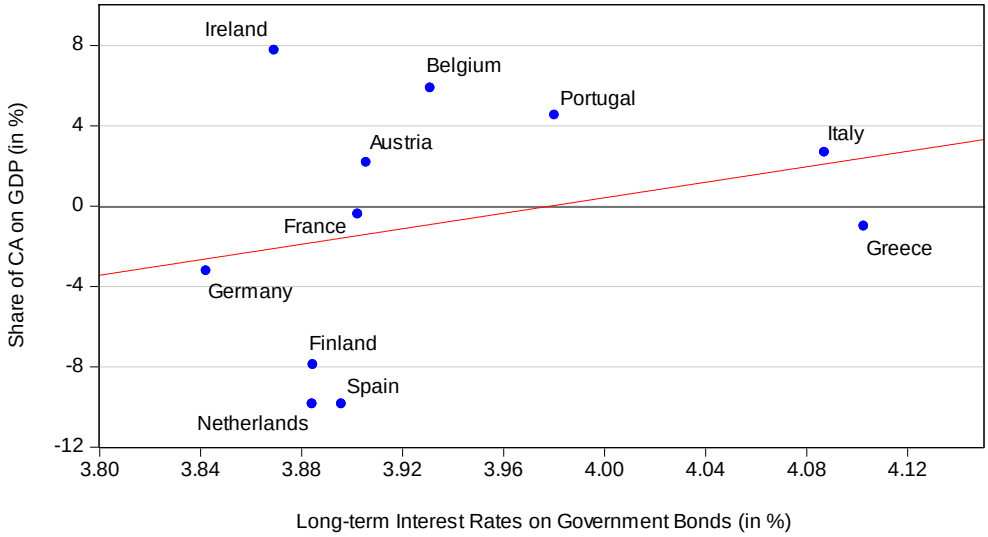

Figure 12.1 Long-term interest rates and current account as percentage of GDP in selected Euro Area countries, 2004-2007

Source: ECB for LT interest rates and Eurostat for CA

National borders turned back to be relevant and the TARGET 2 started registering discrepancies among the components of the balance of payments. It is alleged, therefore, to be a permanent mechanism supporting the deficit of peripheral countries, which substitutes private with public credit (Sinn and Wollmershauer 2011).

However, in times of crisis, it has some further flaws not occurring in a fixed exchange rate regime revealing the limits of the Euro currency area: 1) it works under a common currency so that the relative price adjustment mechanism does not work or at least it works much slower; as a general principle the increasing inflation would have to guide the core countries to a real realignment of the exchange rate. However the existence of a common currency slows down the process of adjustment and increases the burden on deficit countries; 2) it unlimitedly finances the speculative private capital shifts. In a period of missing trust it boosts capital flight from periphery to core countries increasing the needs of refinancing deficit and debt, via the increase of interest rates.

Our interpretation stems for supporting that in times of crisis there is a tight relationship between current account imbalances and the ability to finance additional public deficit. Whatever low the interest rate the ECB sets the existence of a common currency widens the differences and increases the needs of public finance adjustment (Canale Marani 2012).

Figure 12.2 shows the relation between long term interest rates and current account imbalances (average values 2008-2011) for the same selected countries as in figure 12.3.

It is just a picture providing the intuition of a negative relationship between the two variables considered. The range of long term interest rates varies from 2% to 10%, while the current account varies from a surplus of almost 6% to a deficit of 10%. Higher interest rates are always associates with higher current account deficits and vice versa.

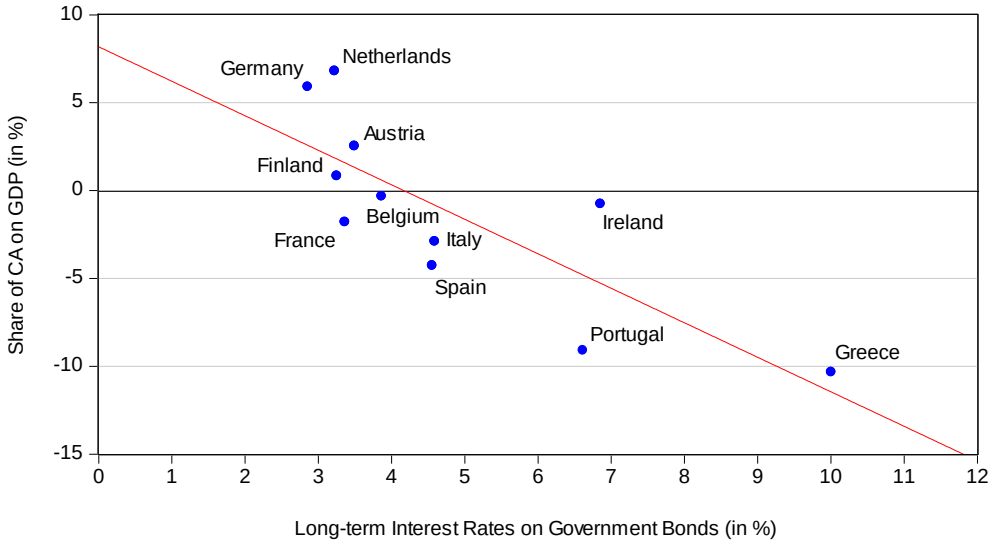

Figure 12.2 Long-term interest rates and current account as percentage of GDP in Selected Euro Area countries, 2008-2011

Source: ECB for LT interest rates and Eurostat for CA

12.4 The model

We consider the economy of a single country of the EMU and therefore that the fiscal policy is national, while the monetary policy is supranational. Furthermore the country can be subject to an external constraint due to the (un)willingness of capital markets to provide liquidity to sustain internal equilibrium.

Below the usual equations representing the equilibrium in the goods market at time t are written. We make the hypothesis that the country imports and exports from other countries of the Euro zone, but for the sake of simplicity, that the whole currency area is a closed economy. This allows us to not consider the exchange rates. We assume to be in times of crisis so that the economy is below the full capacity utilization and the supply curve is horizontal and not explicitly introduced in the model.

$$Y_t = C_t + I_t + G_t - T_t + E_t - M_t$$
$$C_t = c_0 + c_1 Y_{t-1}$$
$$I_t = I_0 - b r_t$$
$$G_t = \bar{G}$$
$$T_t = \bar{T}$$
$$E_t = \bar{E}$$
$$M_t = x Y_{t-1}$$

According to these simple equations the consumption function C_t has an autonomous part c_0 and depends on the income of the preceding year Y_{t-1}. Investments consist of an autonomous part (I_0) and a negative part related to the rate of interest r_t following parameter b. Taxes and public expenditure, in the current year - G_t and T_t - are, again for the sake of simplicity, considered autonomous. Exports at

time t depends on foreign income and are therefore autonomous. Imports depend on the income of preceding year.

Substituting each component of aggregate demand in the initial equilibrium equation, we have:

$$Y_t = c_0 + c_1 Y_{t-1} + I_0 - br_t + G_t - T_t + \bar{E} - xY_{t-1}$$

Dividing both sides of the equation by Y_t, indicating G_t- T_t with D_t and c_0, I_0 and $\bar{E}$, with A_t we have:

$$\frac{Y_t}{Y_t} = (c_1 - x)\frac{Y_{t-1}}{Y_t} + \frac{A_t}{Y_t} - b\frac{r_t}{Y_t} + \frac{Dt}{Y_t}$$

due to the fact that $Y_{t-1}/Y_t = 1/(1+g)$ where g is the income rate of growth. Solving for r we can finally write a dynamic equilibrium in the goods market:

$$r_t = \frac{1}{b_y}\left[(c_1 - x)\frac{1}{1+g} - 1 + a_t + d_t\right] \tag{12.1}$$

or in terms of g

$$g = \frac{c_1 - x}{b_y r_t - d_t - a_t + 1} - 1 \tag{12.1'}$$

where, of course, d_t is the deficit/income ratio and a_t is A_t related to GDP.

Equations (12.1) and (12.1') indicate as usual that the growth rate of income is related to the interest rate and that the public deficit influences r and g.

The second step is to detect how the rate of interest is determined.

A Central Bank sets according to a monetary policy rule known as Taylor's rule. Here it is in a very simple form:

$$r^* = r_e + a_1 g + a_2 \pi$$
$$\frac{\partial r}{\partial g} = a_1 \succ 0; \frac{\partial r}{\partial \pi} = a_2 \succ 0$$

where a_1 and a_2 represent the weight the Central Bank assigns to growth and inflation respectively. For a country belonging to a monetary union the rate of interest has two components: the first is the rate ECB sets and can be considered as an exogenous value; the second is that related to the balance of payment equilibrium expressed in term of ratio to GDP:

$$r_t = r^* - \gamma bp \tag{12.2}$$

as a monetary policy rule for a single marginal country, deriving from the Taylor rule and from the balance of payment constraint. The term γbp describes the necessity of a single country belonging to

a currency union to preserve the national balance of payment equilibrium. If the country is considered unrisky the last term is zero as proof of the perfect substitutability of internal and external assets. On contrary if there is an asymmetry among EMU countries the term γbp describes the additional or reduced returns asked to buy national bonds. In times of crisis the greater the balance of payment deficit - current account and capital flows - the greater the interest rate.

Once fixed the rate of interest we can substitute the equation determining the means of payment in circulation in the goods market equilibrium and solve for d_t. We have therefore

$$d_t = 1 - \frac{c_1 - x}{1+g} - a_t + b_y\left(r^* - \gamma bp\right) \tag{12.3}$$

Equation (12.3) indicates that the deficit d_t generates, other things being equal, the income rate of growth g and that there is a positive relation between the two. It depends negatively also on marginal propensity to consume and the other autonomous components of demand - because of the direct effect on income growth, but positively on the sensitiveness of investments to the rate of interest and to the propensity to import. Fiscal balance varies also - given the rate of interest the ECB sets - with external imbalances: negatively (reduces) with a balance of payment surplus, positively (increases) with a balance of payment deficit.

The third step is to reproduce the equation describing the public sector constraint.

$$B_t = (1+r)B_{t-1} + D_t - \Delta BM_t$$

In the EMU the monetary policy is centralized and it is very unlikely to happen that the Central Bank purchases public bonds of a single country. If it happens the additional high powered money created will be completely sterilized[137]. The public sector constraint therefore becomes

$$B_t = (1+r)B_{t-1} + D_t$$

This equation states that the public sector deficit in the EMU can be financed just through debt. Hence the current debt B_t, is equal to the debt received from the past B_{t-1}, plus interest on it rB_{t-1}, plus the primary deficit D_t.

Dividing all by Y_t, and recalling again that $Y_{t-1}/Y_t = 1/(1+g)$, we have the usual equation describing the dynamic of the debt/GDP ratio b_t through time.

$$b_t = \frac{(1+r)}{(1+g)} b_{t-1} + d_t \tag{12.4}$$

It is obvious moreover that the single country rate of interest on public bonds assumes as reference value the Central Bank repurchase rate but is hardly influenced by the specific risk conditions of the country measured as described above by the balance of payment surplus or deficit.

[137] Recent institutional agreements in EMU (European Stability Mechanism into force from October 2012) have allowed the birth of a program of public bonds purchase on behalf of the central bank on the primary market for countries in difficulty. This program however provides the complete sterilization of money issued and the acceptance of fiscal retrenchment programs.

Equation IV is a simple accounting relation and states that, in order to repay the debt, the rate of growth has to be greater than the rate of interest, regardless of the level of deficit.

To better understand what happens according to this model, we can now combine equations (12.1') (12.2) and (12.3) and (12.4) of our model and describe how it works:

$$g = \frac{c_1 - x}{b_y r - d_t - a_t + 1} - 1 \qquad (12.1')$$

$$r_t = r^* - \gamma bp \qquad (12.2)$$

$$d_t = 1 - \frac{c_1 - x}{1+g} - a_t + b_y\left(r^* - \gamma bp\right) \qquad (12.3)$$

$$b_t = \frac{(1+r)}{(1+g)} b_{t-1} + d_t \qquad (12.4)$$

This model contains four equations and four unknown variables. Once the rate of interest fixed as the result of monetary policy rule and market sentiment about the risk of the country (12.2), the rate of growth results from equation (12.1'), g and r determine the equilibrium value of the deficit (12.3). Finally debt at time t is the result of the variables r, g and dt. See above equation (12.4).

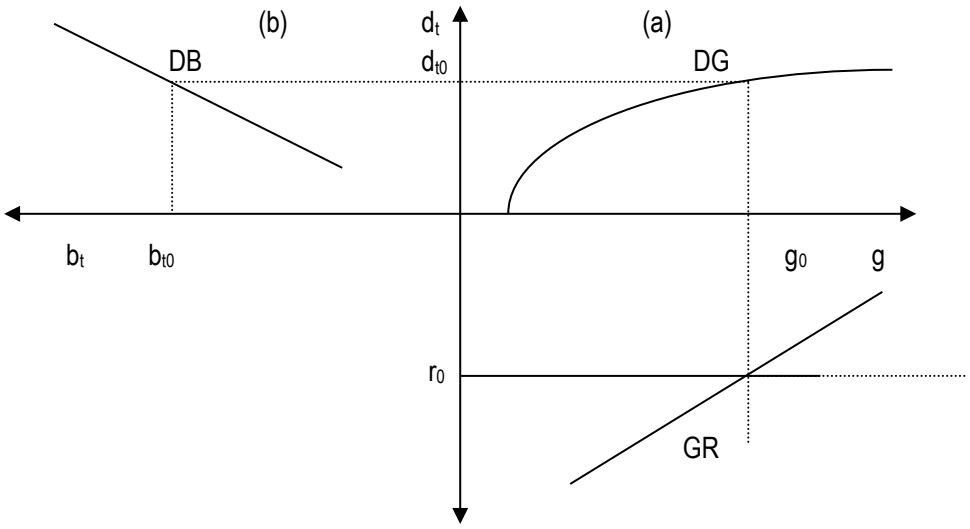

Figure 12.3 Deficit, debt and income growth

This situation is depicted in Figure 12.3. Equation (12.3) is described in panel (a) through the curve DG: public deficit influence the equilibrium growth rate positively. The curve DG shifts downward - i.e. a lower deficit is required to realize the same growth rate - whenever part of the autonomous a_t increases. An increase in the value of ($c_1 - x$)- causes a reduction in the slope. The curve shifts upward whenever there is an increase in the sensitivity of investment to the rate of

interest, an increase of the rate of interest the Central bank sets and a balance of payment deficit $bp < 0$ in condition of missing trust $\gamma > 0$.

In panel (b) the curve DB represents the relation between debt described by equation (IV). Panel (d) describes the relation between the usual goods market equilibrium in a dynamic form GR (equation I) and interest rate set both by the monetary policy rule and the balance of payment value $(r = r^* - \gamma bp)$.

12.5 Effects of fiscal expansions in the European Monetary Union

The opinion expressed in this section is that a greater deficit can influence growth and make the debt repayable. This conclusion holds if the Central bank does not change its monetary policy rule and raise the interest rate when there is a fiscal expansion and when the country is not subject to an external constraint.

Case 1: No external constraint

Suppose, as in the first case, that deficit increase causes no restriction on interest rates of the Central Bank and of external balance (figure 12.4).

Suppose that public expenditure increases without a corresponding increase in taxes but with an increase of public debt. The curve representing the goods market equilibrium GR moves rightward. If interest rates do not shift because there is no inflationary phenomenon, which is most likely for the initial hypothesis of underemployment. In panel (a) the new values of deficit and growth are shown. Because the rate of interest has remained constant, the positive effect of public spending on equilibrium income is not crowded out by the increase in interest rates.. This result is observable in panel (d) (Movement of GR curve to GR')

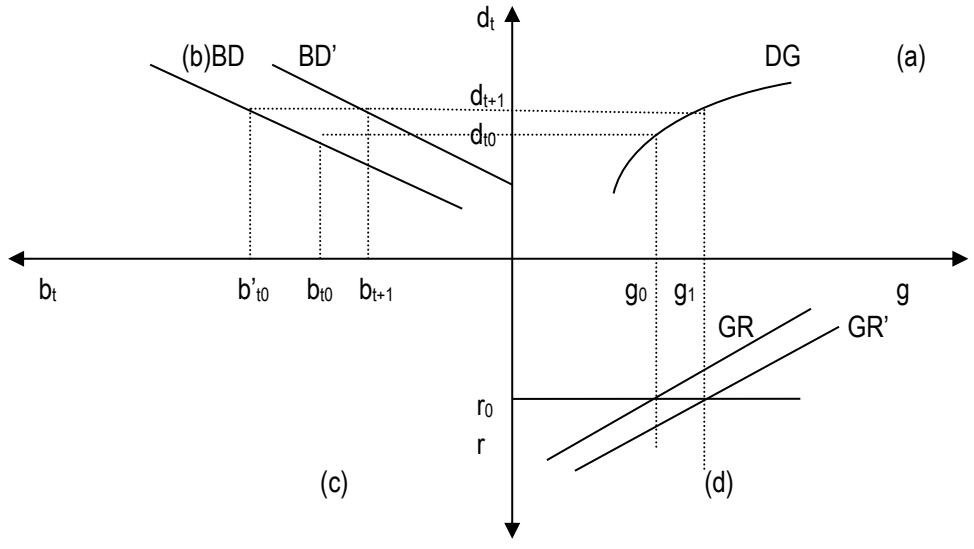

Figure 12.4 Deficit spending effects on debt and growth without interest rates increase

The line representing the relation between deficit and public debt – after the initial increase of debt in b'_{t0} - shifts upward from BD to BD' - due to the increase in growth greater than the increase in debt (panel b). The new deficit level, d_{t+1}, now corresponds to a lower debt level, b_{t+1}.

Case 2. Existence of an external constraint

The second case is that of the increase in deficit associated with a rise in interest rates due to both the unwillingness of financial markets to finance the additional current account deficit and to capital out-flows for the perceived increasing default risk (this case can be re-conduced to the case of a restrictive monetary policy rule, (Figure 12.5).

To grasp this point better, suppose that the increase in interest rates is greater than the increase in growth and such as to offset the positive effects of public spending. In panel (d) the curve representing the equilibrium in the goods market moves rightward from GR to GR', and the interest rate moves upward as a consequence of capital out-flows from r_0 to r_1. The increase in interest rates causes a reduction of growth and an upward movement of the DG curve in DG' (panel (a)). Equilibrium growth so reduces (panel a). in this case the greater deficit d_{t+1} causes a reduction in equilibrium income growth from g_0 to g_1. Debt has increased from b_{t0} to b_{t+1} and, due to the higher interest rate r_1 and to the lower growth g_1, this increase is more than proportional to the deficit increase. This circumstance is shown in panel (b) with a downward shift of the curve BD in BD'.

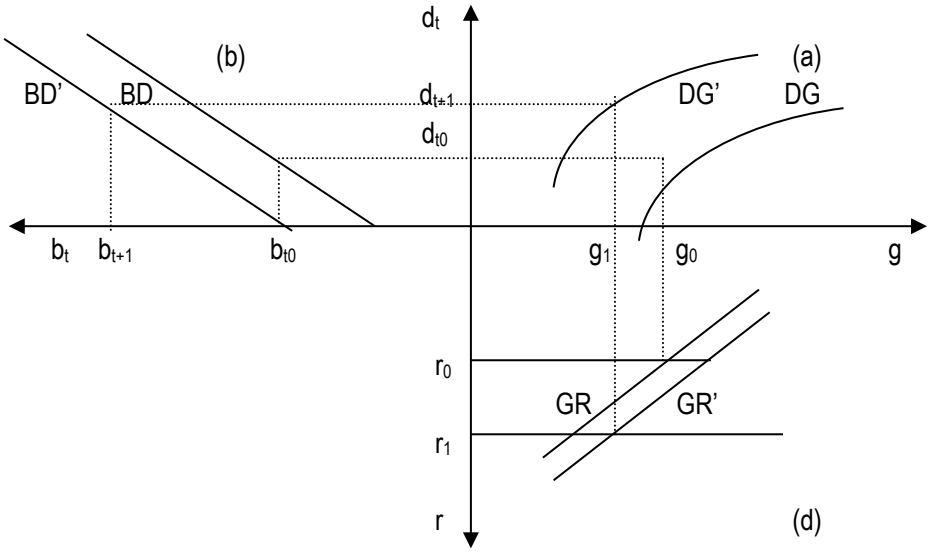

Figure 12.5 Deficit spending effects on debt and growth in presence of an external constraint

In short, if the increase in public spending is associated with a balance of payment deficit and to an increased perceived risk (the same happens if Central Bank increases interest rates), limits the positive effects of deficit. Furthermore, if this increase exceeds that of the equilibrium income, the debt increases to ever greater levels. Therefore despite a first positive effect of deficit spending on growth - the fast and faster debt increase - causes financial instability, expectations of increasing taxes and reduction consumption and income in a longer period. Opposite results are registered in countries with balance of payment surplus: the reduction effects on interest rates widen the positive effects of public spending and further reduce public debt.

12.6 Conclusions

The starting point of this chapter has been the critique to the idea that economic policy is useless. Looking at events from a different perspective, it has been concluded that deficit spending causes an increase in growth and helps to reduce debt provided that there is not an increase in interest rates coming from the external constraint. The general conclusions to draw from the model presented are: 1) fiscal policy can still be considered an instrument of economic policy and 2) monetary and fiscal policy co-ordination is desirable to achieve growth.

In addition the model, despite the limits of a stylized representation, brings the reader to reflect on the circumstance that peripheral countries, whatever their original sin, must bear in times of crisis huge costs because of their inability to reduce interest rates. EMU asymmetries cannot be solved without a shared policy action and without taking into account the systemic shock coming from the crisis. In this context, a jump of quality toward a political union is required: the absence of a shared project will pave the way to those who are convinced that rather than bear such high social costs, it would be better to grant autonomy to the national economic policy. However in the globalization era this would likely be– following the "Rodrick's trilemma"[138] (Rodrick 2011), a loser choice.

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Chapter 13

DETERMINANTS OF FISCAL CONSOLIDATION SUCCESS IN V4 COUNTRIES

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DETERMINANTS OF FISCAL CONSOLIDATION SUCCESS IN V4 COUNTRIES

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Abstract

The crisis of public finance negatively affected the overall economic development in all EU Member States, and therefore issues related to the regulatory mechanism not only of the financial sector, but the economy as a whole, are more than justified. The focus of fiscal consolidation is to a certain extent a "stumbling block" among the indebted countries. Issues aimed at defining the type of fiscal consolidation, the determination of the specific components of one sided oriented consolidation, and not least the determinants of individual components come into the spotlight. All these issues are important in order to help reduce public debt and to support persistent long-term fiscal balance in the EU. This chapter focuses on the identification and comparison of revenue and expenditure based consolidation, which would substantially contribute to the reduction of public debt in the V4 countries for the period 1996 to 2014.

Keywords: debt crisis, foreign debt, Southeast Europe, current account deficits, PIIGS.

Motto: "We don´t care for the debt! It´s big enough, to care for itself."

13.1 Introduction

The crisis of public finance negatively affected the overall economic development in all EU Member States, and therefore issues related to the regulatory mechanism not only of the financial sector, but the economy as a whole, are more than justified. The focus of fiscal consolidation is to a certain extent a "stumbling block" among the indebted countries. Issues aimed at defining the type of fiscal consolidation, the determination of the specific components of one sided oriented consolidation, and not least the determinants of individual components come into the spotlight. All these issues are important in order to help reduce public debt and to support persistent long-term fiscal balance in the EU. Preliminary research data from the AMECO database identifies factors, which have significantly reduced the country's debt, on average, by 37 percentage points. Previous research has analysed the situation of accumulation and decreases of public debt in the Slovak and Czech Republic (Jakubíková, Mihóková, 2011). The topic of fiscal consolidation and its success was also dealt within

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institutions such as the IMF and OECD. In 2003, the IMF conducted an analysis on a sample of 79 industrial and developing countries over the period of 1970-2002, based on the analysis of major public debt reduction according to previous research by Reinhart, Rogoff and Savastano (2003).

This chapter focuses on the identification and comparison of revenue and expenditure based consolidation, which would substantially contribute to the reduction of public debt in the V4 countries for the period 1996 to 2014. This analysis was performed in several stages. The first part focuses on the determination of the debt accumulation and debt reduction periods by using year-on-year comparisons with a debt-to-GDP ratio indicator. The second part of the analysis was focused on model specification based on theoretical and empirical evidence in order to identify factors, which in related periods influenced the major part of debt reduction and debt accumulation in Visegrad countries. The probability of success in fiscal consolidation described in the last part has been derived based on a logistic probabilistic model with two different equations for revenue and expenditure consolidation.

The empirical results of models are presented in two basic levels. The first level is focused on the identification of the type of fiscal consolidation, which has most successfully contributed to debt reduction. The second level is aimed at identifying factors, which determine the probability of success of major debt reduction. Several issues regarding potential future research could mainly cover the topics for the identification of described fiscal consolidation component types, which contribute to the increase of debt reduction probability in countries V4.

13.2 Theoretical and empirical aspects of systemic financial crisis and fiscal consolidation

Soros (2009) at the beginning of the crisis said, that the world has been in the middle of the worst financial crisis since 1930s of the last century. The current global crisis is mostly compared with the “Great Depression”, as is also confirmed by the European Commission in *Public Finance in EMU 2012* with the addition that the current sluggish economic development, despite the strengthening of institutional frameworks of all Member States, raises concerns also about re-slump and problems in the financial markets.

Dealing with the consequences of systemic crisis, as it is called in academic and expert circles, is the “top theme“ of most countries in the world. The academic and experts economic community, as well as, government policies supported by fundamental decisions of EU are looking for solutions to persist or slow down the negative trend marked by high levels of public debt. The need for solutions of public finance crisis, which has adversely affected the overall economic development, enhanced issues associated with regulatory mechanism, not only in the financial sector but in the economy as a whole. Therefore these issues are more than justified. International institutions, academic and economic communities are increasingly paying attention to the issue of identifying the fundamental determinants and ways of solving this problem. Empirical studies and real national governments focus on the implementation of fiscal consolidation that would reduce public debt as much as possible.

The term financial crisis is defined by a wide range of domestic and foreign authors (Goldsmith, 1982; Bordo, 1987; Mishkin, 1996; Musílek, 2004; etc.). In the theoretical analysis the definition “financial crisis” includes some basic failures of financial system, based on the theory which

defines the basic types of crises. Typology of financial crises and their characteristics are also stated in the IMF World Economic Outlook (1998), and Dvořák (2008) this typology refers to the traditional typology of financial crises.

The total number of financial crises in practice is relatively high. 69 cases of financial crises took place since 1979 in developing countries (Caprio and Klinngbeil, 1999), and a total 71 cases of financial crises took place from 1970-1995 (Kaminsky and Reinhart, 1999). 77 crises identified by Eichengreen, Rose, Wyplosz (1996) occurred in years 1959-1993 in industrialized countries. Eichengreen and Bordo (2002) identified the existing crises in industrialized and developing countries, and their total number from 1880-1997 numbered 108 in industrialized countries and 150 in developing countries. The largest number was concentrated in the same period 1973-1997.

These researches confirmed that history is full of financial and economic crises, but most of them have in terms of analysis national or local character. Only a few of these crises were attributed as systemic.

The current crisis, however, represents a historical milestone in the development of human society, which requires new approaches and recognizing connections when analyzing the causes, consequences, and especially methods of dealing with a crisis. Stanek (2010, p.7) stated: "The processes of globalization, transnational corporations, financial sector virtualization, process of outsourcing, offshoring, income stratification, but also sovereign wealth funds and the new leaders of the global economy, creating an entirely new combination of global and local systemic phenomena." The fact, that this is one of the most important historical crises confirms an increasing number of authors (Krugman, 2008; Petras, 2008; Dvořák, 2008; Vitek, 2011) and Foster and Magdoff (2009), who showed even the possibility of radical social change, as result of the crisis.

New characteristics, specific to the current crisis, categorize it to models of financial crises of the fourth generation, which are characterized by terms such as "full-fledged financial crisis"[141], "systemic financial crisis"[142] and "general financial crisis[143]."

IMF (2011) focused on identification of systemic crises in its publication *Analytics of Systemic Crises and the Role of Global Financial Safety Nets*. Based on the specifications by which idiosyncratic crisis differs from the systemic crisis, authors developed a methodology to identify systemic crisis. In this analysis they developed systemic crisis indicator, which includes financial and economic aspects of each country. Using this indicator they identified four clusters of systemic crises ranging from the crisis in 1980 and 1982 in Latin America, 1992-1993 European ERM crisis, at the end of 1990 Asian crisis, Russia's long-term capital to the current crisis. Systemic crisis is characterized by two main elements - the importance of financial and economic stress and the extent of their exposure (IMF, 2011). During a systemic crisis, the financial markets are under pressure and characterized by massive panic and investor decisions that create a general acute liquidity crisis that spreads rapidly from the center. The real impact of this shock is quickly realized by the loss of output and disruption of financial and trade ties between the countries, what will pull country trough macro financial cycles into a vicious circle (IMF, 2011).

[141] More details in Radelet Sachs(1998b)
[142] More details in Mishkin (2001)
[143] More details in Krugman (2001)

Transfer of the costs that are caused by financial crisis into the public finances was called by Rosengard (2004) as fiscalization of financial crisis. Identification of systemic crisis impact on fiscal balance of economy was carried out by Eschenbach and Schuknecht (2002), who conducted a comprehensive panel data analysis of fiscal costs on financial instability. This study on the sample of 20 industrialized countries in the years 1982-2001 pointed on the increase of fiscal balance variability in periods of financial instability. The issue of financing the increasing fiscalization of financial crisis as a way of reducing the public debt was the main objective of the study of Burnside, Eichenbaum, Rebelo (2003). They analyzed data of three currency and banking crises with the aim to identify resources and ways that counties have used for covering their fiscal costs.

Current systemic crisis is according to Nemec responsible for: "…extreme indebtedness of all segments of the economy - from households across the corporate sector, banking sector, to the countries themselves" (Nemec, 2011, p.27), and so the current crisis except for economic performance reduction, had in addition transformed into its third phase - the public finances crisis.

The evolution of European countries' indebtedness shows increasing public finance deficit tendency that had emerged from about the 70th. Fiscal consolidation realized during this period kept the deficit and public debt in the countries at the required levels. Public finance deficit tendency was explained by Jilek (2011) mainly by political and institutional factors. Previous knowledge about the political causes of budget deficits were discussed in the study *The Political Economy of Public Deficits* by authors Imbeau and Chenard (2002), which had included to the main reasons of public deficits the electoral budget cycle hypothesis, an ideological concept - hypothesis of shifting the tax burden between generations and the negative strategic behavior.

The debt problem, which has become the basis of this crisis, is the most serious consequence in the form of a large volume of unpaid loans. Limited opportunities for the banking sector in solving this problem had allowed transfer of unpaid private debt to public debt.

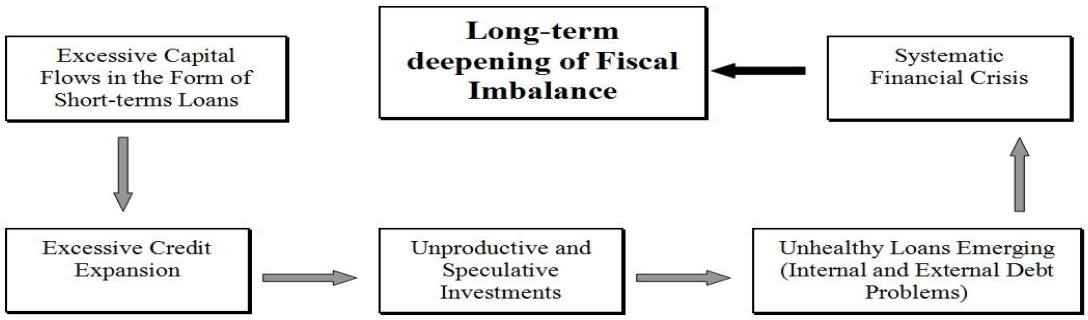

Figure 13.1 Scheme of long-term deepening of fiscal imbalance

Source: authors, according to Dvořák (2008)

The argument is enhanced by Dvořák, who refers that "... the debt problem is the cause of a common currency and banking problems in the systemic financial crisis." (Dvořák, 2008, p. 218) The next scheme illustrates the logical steps of this long-term deepening of fiscal imbalance.

These assumptions are actually reflected in the years 2007 - 2011 in all EU countries where a significant increase in the relative weight of the public debt has occurred.

According to this figure, fiscal consolidation is necessary step in each country; especially when in the long-term view are the countries public finances sustainability threatened. Therefore the justified question arises: If governments face high public debt levels, what can they do to reduce them?

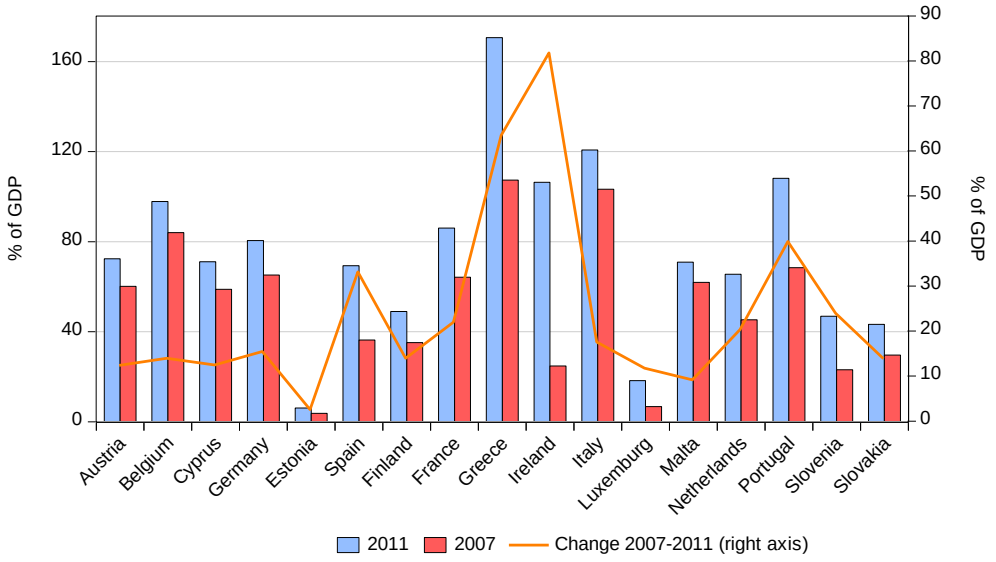

Figure 13.2 Evolution of general government debt in EU in 2007-2011

Source: authors, according to database AMECO

Literature on fiscal consolidation concentrates mainly on the identification of these basic components. The first group focuses on basic determinants that affect the start of fiscal consolidation. The original fiscal condition of the country, including the macroeconomic environment and political economy settings are considered as the most important factors determining the beginning of consolidation. Weak public finance conditions are found to be an important trigger of consolidation (Barrios *et al.*, 2010; Guichard *et al.*, 2007; European Commission, 2007; Von Hagen and Strauch, 2001; etc.).

In general, the process of fiscal consolidation and its duration is according to the literature review set, that gradually implemented consolidation tends to be more successful than quickly established consolidation. However, in cases with high and rapidly increasing levels of debt and slow economic growth may be more effective consolidations with quick impact (Barrios et al, 2010; European Commission, 2007; Molnar, 2012).

A large part of the literature and empirical studies have focused mainly on the composition of fiscal consolidation. In particular, whether it should focus on spending cuts, increasing the revenue side, or be in "optimal" combination of both parts. Composition of consolidation is considered to be one of the most important determinants of its success. Research in this area confirms that a greater probability of success have spending-based consolidations (Alesina and Ardagna, 1998, 2009; Von Hagen *et al.*, 2002; Guichard *et al.*, 2007; Barrios *et al.*, 2010; Nickel, Rother, Zimmermann, 2010; OECD, 2007; IMF, 2003; Molnar, 2012; etc.) A possible explanation for the higher efficiency of spending cuts versus tax increases is that they are often associated with reforms that increase the efficiency of budgetary procedures (European Commission, 2007). Reducing costs (particularly with respect to government consumption and transfers), indicate a greater probability of sustainable fiscal

consolidation and improved economic performance (Alesina and Bayoumi, 1996; Alesina and Perotti, 1996). The importance of expenditure based fiscal consolidation confirm others research such as Bassanini *et al.* (2001), Ardagna (2004), De Mello *et al.* (2004) and Cournède and Gonand (2006), which by using dynamic general equilibrium model with overlapping generations, argue, that raising taxes is a much more expensive way.

Researches focused on the area of public spending are not consistent when identifying the composition of government expenditure cuts. Alesina and Perotti (1995, 1997) proposed cuts in social spending and government wages, as confirmed by research Nickel *et al.* (2010). European Commission (2007) points to the positive effect of reducing primary expenditure. Molnar (2012) confirmed that the cuts in social spending and government wages are an effective instrument of consolidation, which may have only short-term effects, and should be accompanied by the reduction of subsidies.

Although, expenditure based consolidation is mostly considered as successful, revenue-based consolidation can also be effective, especially in a country, where is a space for increasing tax revenues that are less harmful to economic growth (Tsibouris *et al.*, 2006; European Commission, 2011; OECD, 2007; etc.). European Commission in *Tax Reforms in EU in 2011* emphasized the necessity to devote special attention to the quality of the tax system and ensure a positive impact on economic growth: "growth-friendly".

OECD (2007) research indicates that the increase of revenues represented in average a larger proportion of the total reduction in the basic budget position. Based on a comparison of the role of spending and revenue in consolidation episodes concluded that in nearly two-thirds of the consolidation episodes increasing of revenues contributed. Reflections on the quality of the taxes implementation and tax-based consolidation are still under discussion of academic and political sphere. Given the fact that the *Strategy Europe 2020* for intelligent and sustainable growth, emphasized the importance of the revenue side of the budget, is according to the quality taxation concept implemented the identification of tax-based consolidation potential across Europe (European Commission 2010, 2011).

In theoretical level there were specified two basic objectives, which are also the background for empirical studies in the area of reducing public debt. The first group focuses on the overall sustainability of the public debt and examines which fiscal measures can stabilize public debt. European Commission (2011) in *Public Finances in EMU in 2011* provides a basic methodology and empirical researches that are applied in assessing sovereign debt and fiscal sustainability. These are the four main groups, namely: an econometric approach (Hamilton and Flavin, 1986; Threhan and Walsh 1988, 1991; Rush and Hakkio, 1991; Wilcox, 1989; Kremers, 1989, 2005, 2007; Bohn, Mendoza, Ostry, 2008), "gap" approach (Blanchard, 1990), the threshold approach (IMF, 2002, 2004, 2010; Abiademom and Ostry, 2006), the stochastic approach (Barnhill and Kopits, 2003; Garcia and Rigobon, 2004; using VAR, Mendoza and Oviedo, 2004).

The second part of the literature focuses on reducing debt through financial analysis of fiscal adjustment programs. The problem with this approach, described by Nickel, Rother, Zimmermann (2010), is the scarcity of studies; and that the most of them are based on data from OECD countries and featured case studies (Giavazzi and Pagano, 1990, 1996; Alesina and Perotti, 1995, 1997; Afonso *et al.*, 2006).

13.3 Episodes and determinants of debt accumulation and reduction identification

The first step of analysis was the identification of periods, during which a reduction or accumulation of public debt occurred in V4 countries. The period of debt increasing represents the episode of debt accumulation or stagnation, in which the year-on-year change in the gross public debt-to-GDP ratio is zero or positive. The episodes of debt reduction represents periods, in which the year-on-year change in the gross public debt-to-GDP ratio is negative. The period of debt reduction was then divided into two subgroups. If the negative change in debt-to-GDP ratio in three consecutive years declined by more than 6 percentage points, the episode is considered as a major public debt reduction episode. Definition of the time period for major debt reduction was consulted with the literature available. The period was set for three years considering the IMF (2003), Nickel *et al.* (2010) and Molnar (2012). Major debt accumulation period, defined if the change of ratio debt-to-GDP in three consecutive years was positive and at the same time increased by more than 6 percentage points , was also deduced analogically.

AMECO[144] - European Commision database was used with the period 1995-2014 for identification of individual periods. Data was also complemented using the OECD[145] database for the period 1990-1995. Data for years 2013 and 2014 are data forecasted by EC relevant staff.

Table 13.1 Identification of major public debt accumulation

Country	Period of major debt accumulation t_0-t_n	Debt ratio		Change in debt ratio t_n-t-1
		trough t_n	peak t-1	
EU-27	*2008 - 2014*	62.48	87.19	24.71
Czech Republic	*1997 - 2004*	12.58	28.94	16.36
	2008 - 2014	28.70	44.91	16.21
Hungary	*2002 - 2010*	55.92	81.42	25.49
Poland	*2001 - 2003*	37.56	47.05	9.49
	2008 - 2011	47.11	56.34	9.23
Slovakia	*1995 - 2000*	22.08	50.30	28.22
	2009 - 2014	35.56	53.51	17.95

Source: authors, calculation according to AMECO, OECD database

Analyzing the specified time frame data using the defined methodology, we have identified altogether 47 periods of debt accumulation and 33 debt reduction periods in V4 countries. From the identified 47 episodes of accumulation were altogether 7 of major debt accumulation in V4 countries. As can be seen in Table 13.1 in Czech Republic, Poland and Slovakia were identified two periods of major debt accumulation which in average were more than 16% of GDP increase. In Hungary only one stage of debt accumulation with a total change of more than 25% was identified. Episode of major debt accumulations was clustered mostly in the time frame 2008-2013, what is in line with the general

[144] AMECO is the annual macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs (DG ECFIN). The database is regularly cited in DG ECFIN's publications and is indispensable for DG ECFIN's analyses and reports. To ensure that DG ECFIN's analyses are verifiable and transparent to the public, AMECO data is made available free of charge. Deffinition according to: http://ec.europa.eu/economy_finance/db_indicators/ameco/index_en.htm

[145] OECD.Stat includes data and metadata for OECD countries and selected non-member economies. Deffinition according to: http://stats.oecd.org/

assumption of indebtedness increase as the deepening the impacts of economic crisis. In EU 27 countries in average was a major debt accumulation episode identified for the time period 2008-2014.

Table 13.2 Identification of major public debt reduction

Country	Period of major debt reduction t_0-tn	Debt ratio		change in debt ratio t_n-t-1
		peak t-1	trough t_n	
EU-27	*1997 - 2002*	68.30	60.39	-7.91
Czech Republic				
Hungary	*1994 - 2001*	86.65*	52.65	-34.00
	2010 - 2014	81.41	78.04	-3.37
Poland	*1993 - 1998*	81.02*	38.90	-42.13
Slovakia	*2000 - 2008*	50.30	27.86	-22.44

Source: authors, calculation according to AMECO, OECD database
Note: * Data from OECD database

Identification of major public debt reduction showed a total of 4 periods. In the case of Czech Republic we didn´t recognize period of major debt reduction. Episodes of major reduction concentrated mainly in the times countries´ accession in the EU. The time span of episodes ranges from 6 years in Poland to 9 years in Slovakia. The relatively long time span of these episodes indicates that the debt reductions were remarkably large and persistent. It also reflects the need for countries to fulfill the conditions of entry into the EU, in case of Slovakia to joining the EMU. Average percentage change of reduction in V4 was 25.48%, with the biggest change in Poland with a total of 42%.

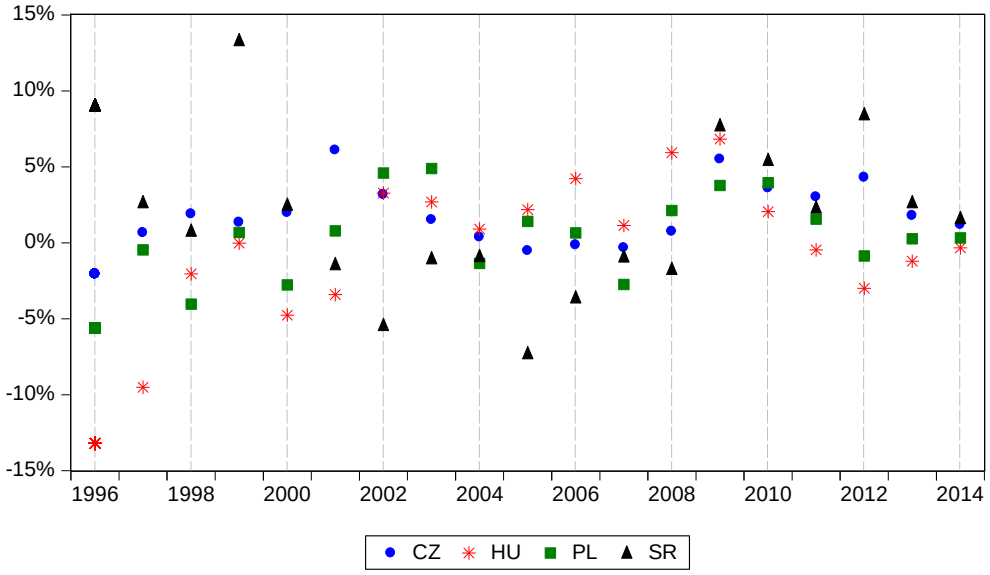

Figure 13.3 Map of debt accumulation and reduction episodes

Source: authors, calculation according to AMECO, OECD database

The figure below clearly shows visible distribution of reducing and accumulating debt in the V4 countries within a specified time frame 1995-2014. At the beginning of the period are visible scatter values. Extreme values show debt accumulation in Slovakia between 1995 and 1999 and debt reduction in Hungary in 1996 and 1997. Dispersion values dwindled over the years. Episodes of debt accumulation are concentrating especially in the years 2008-2012. The period of depression is

characteristic especially for the years 2001-2007 except for the Czech Republic, which shows stagnation or accumulation of debt. The overall trend shows a deficit slope of public finances.

13.3.1 Determinants of public debt accumulation and reduction episodes

Among the factors that contribute to changes in public debt can be generally included factors like the economic situation of the country, the political situation, fiscal rules setting, social policy setting, demography, and several other factors.

However, governments have a relatively limited number of tools and options that they can use to contribute to the national debt reduction. As reported by Dvořák (2008), from the short time view there is no fully effective and enforceable government strategy that would be actually feasible and that would help to solve the high indebtedness. To the two basic ways that governments take, are mentioned by Dvořák (2008): passive approach, based on the positive impact of exogenous factors without the active participation of government and the active approach that focuses on the use of available economic policy measures.

Among the exogenous factors that have a positive impact on the level of public debt is the "most comfortable" - economic growth. Bispham (1987), in his analysis points out the positive impact of economic growth if the growth rate exceeds the effective real interest rate on public debt. This effect can be significant especially in the time of expansion and low interest rates. Government can contribute to creation of an environment supporting macroeconomic and structural economy. It is seen in the period of economic recession, when there is a deepening of long-term fiscal imbalance. The negative correlation of economic growth and government debt are noted in the study of authors Pattillo, Poirson, Ricci (2002), who were using simple correlation between public debt and growth in emerging markets since 1990, where analysis showed a negative relationship. They determined that foreign debt is starting to have negative impact on growth, once exceed 35-40% of GDP. On the other hand, according to the results of the study IMF (2003) real GDP growth was a significant factor contributing to the decline in the debt ratio in average 8.5% per annum. These results were achieved in collaboration with other determinants as the expenditure based consolidation and inflation rate of about 5%.

Inflation is another exogenous factor; although that doesn´t reduce nominal value of public debt it reduces the real value (Dvořák, 2008). Nickel *et al.* (2010) argue that inflation may only have a short-term effect. Once agents expect further inflation increases, this will be priced in yield expectations and thus burden public finances. Moreover, such policies risk unanchoring inflation expectations and thus contributing to macroeconomic instability. Default high inflation provide a way to reduce debt, but this possibility without triggering large primary surpluses is associated with high costs, which are also difficult to measure. Authors who dealt with these issues are i.e. Obstfeld and Rogoff (1996), Morton and Lindert (1989), Özler (1993), Rose (2002), Lucas (2003) and others.

Reduction of foreign debt by creditors themselves is exogenous factor, which plays an important role, especially in developing countries, where there is a possibility of outstanding debt amount redemption.

The active government policy for solving the debt problem is influenced by three basic factors, which represent an obstacle to its implementation. Despite the fact, that these opportunities to actively

reduce the debt to GDP ratio are limited, some countries have made in the past some surprising results. IMF study (2003) provides concrete examples of countries, where there has been a significant reduction in the public debt, as well as an overview of the instruments and the factors that contributed to its reduction. As IMF (2003) explained, when the government faced high levels of public debt, they have mainly political means to reduce it. These include in particular the setting of fiscal policy and running primary budget surpluses, the efforts of economic growth increase, or sell assets to repay the debt gradually. All these options have their advantages and disadvantages.

The IMF study (2003), OECD study (2007), Nickel *et al.* (2010), Molnar (2012) econometric analysis confirms that the primary balance plays an important role at the beginning, the size, duration, and especially success of consolidation for achieving fiscal sustainability.

Regarding the size of fiscal consolidation, analysis confirmed the importance of the initial budgetary conditions. The higher initial primary deficit means the greater overall consolidation achieved during the episode. Higher values of initial deficit were also associated with a longer period of consolidation (OECD, 2007). Analysis of Nickel *et al.* (2010) in the EU has shown that debt reduction occurred mainly in periods of strong economic growth and was due to a high level of primary balances supported by spending cuts. Primary surpluses were twice as large as in the major and modest debt reducing episodes, indicating that the fiscal cuts have been responsible for the most of major changes. On the other hand, an increase in revenues did not result to debt reduction.

Indispensable factor is the composition of fiscal consolidation. Research Alesina and Perotti (1996), Alesina and Ardagna (1998), Alesina and Bayoumi (1996) and Von Hagen *et al.* (2002) shows that it is more likely to achive sustaining fiscal consolidation and enhance economic performance by restrictions on spending (especially government consumption and transfers) and by solving politically sensitive items on the budget (transfers, subsidies and government wages) support permanent fiscal consolidation and support the economic performance. On the expenditure consolidation and greater emphasis on cuts in social spending points out the study by OECD (2007). Further research carried out in the success of fiscal consolidation is given in first section.

Fiscal consolidation may not be focused on just one area. This argument confirms previous research by Von Hagen *et al.* (2002), which states that some countries have relied on the so-called "switching strategies". It means that the government begins the fiscal consolidation by raising taxes and / or reducing the investments and later this strategy is extended, which means reducing current expenditures.

OECD (2007) emphasizes and empirically derives the importance of the next determinants, which are the setting of fiscal rules, containing political mechanisms to prevent excessive spending of state budgets. Based on the empirical analysis, suggests that fiscal rules with embedded expenditure targets tended to be associated with larger and longer adjustments, and higher success rates. Fiscal rules influenced the size of fiscal consolidation as well as intensity and its duration. The results of this study also indicate that combined spending and budget balance rules helped to achieve balance that stabilized to the debt-to-GDP ratio.

Factors that are involved in influencing the debt reduction periods we consider also as the determinants of the debt accumulation period. Dvořák (2008) draws attention to four key determinants, which include: the default value of the share of public debt due to interest rate and the growth rate of GDP at the beginning of the financial year, the size of the primary deficit in the budget

period, the rate of monetization of debt (which reflects the extent to which is the public debt transformed by open market operations into the increase of the money supply), and the ratio of the interest rate paid for the debt and GDP growth.

The impact of each factor can be expressed by the equation, which shows the positive relationship of the relative weight of public debt and the value of the initial debt, primary deficit, as well as the interest rate and GDP growth ratio. With the growth of these variables there is also a relative growth of the debt. Decrease in the relative weight of debt can cause the debt monetization:

$$\overline{d_1} = \overline{d_0} * R + \overline{pd_1} - \overline{dM_1} \quad [146] \qquad (13.1)$$

It is important to note that none of these factors, with the exception of the primary government deficit, can the government affect, as mentioned in the determinants of public debt reduction.

Based on theoretical and empirical analyses we introduce the basic determinants of the public debt reduction and accumulation episodes (Table 13.3). Data on individual factors are used from the EC annual database AMECO and OECD statistical database.

Table 13.3 Contributing factors to debt accumulation and reduction

	Total Sample	Debt Accumulation	Debt reduction	Major debt reduction
Δ public debt-to-GDP ratio	0,87	3,23	-2,48	-2,95
Primary balance	0,25	-0,07	0,87	0,08
Δ primary expenditure ratio	-0,49	0,03	-1,44	-0,82
Δ revenue ratio	-0,24	-0,04	-0,58	-0,74
Real GDP growth	3,14	2,31	4,88	4,57
Real GDP trend growth	3,19	2,99	3,51	3,65
Real output gap	0,11	0,16	0,96	-0,27
Tax burden	7,19	5,18	10,32	12,64
Real implied interest rate	2,88	2,60	3,16	4,18
Interest burden	6,85	6,38	7,44	9,13
No. of observations	**80**	**47**	**29**	**4**

Source: authors, calculation according to AMECO, OECD database

Suggesting from Table 13.3, episodes of debt accumulation were accompanied by low level of fiscal balance and relatively low but positive primary expenditure ratio in time of sluggish GDP growth. Episodes of debt accumulation are also characterized by small but negative ratio revenues-to-GDP. On the other hand episodes of debt reduction were characterized by higher GDP growth rate with a relative high increase on primary balance with increasing both the expenditure and revenue ratio.

When comparing the episodes of major and modest debt reduction the year-on-year change of the debt-to-GDP ratio in major episode is higher than in modest debt reduction episodes and is three times bigger than the average value for the sample of data. During the periods of major debt reduction the debt decreased almost by 3% per year. In the episodes of reduction is this value similar and very close to the one in the major episodes. This debt year-on-year decrease of almost 2.5% can be the

[146] More details in Dvořák (2008)

reason of individually implemented short term consolidation bursts in order to fulfill Maastricht criterion or fiscal rules.

When assessing the potential factors that contribute to the debt reduction from the table we can suggest primary balance, change in the expenditures, revenues, output gap and interest burden. When looking at the change of expenditures we can see that they are in line with the efforts of current countries' government expenditure cuts efforts. Changes on the revenues do not seem to increase during periods of major or modest debt reduction, so a revenue based consolidation should not be expected to be used. On the other hand the expenditure ratio is in all periods higher that the revenue ratio. This situation may suggest a combination between revenue and expenditure based consolidation efforts in those countries during analyzed time frame.

Table 13.4 Change in interest burden during major public debt reductions

Country	Period of major debt reduction t_0-tn	Interest Burden		Change in interest burden t_n-t-1
		peak t-1	trough t_n	
EU-27	*1997 - 2002*	6,65	5,36	-1,29
Czech Republic				
Hungary	*1994 - 2001*	13,13	9,76	-3,38
	2010 - 2013	5,35	5,71	0,37
Poland	*1993 - 1998*	11,67	10,91	-0,76
Slovakia	*2000 - 2008*	9,42	4,58	-4,84

Source: authors, calculation according to AMECO, OECD database

It is worth to mention the fact, that the most significant period of debt reduction is associated with a higher cost of debt management, namely implicit rates that during the reduction gradually decreased. As seen in Table 13.4, the rate of debt is dramatically high at the beginning of major debt reduction period. Participants in the market are willing to refinance government debt only at the cost of increased yield of government securities. The state pays for the debt financing higher interest rate and that increases the cost of managing debt. Efforts about saving these costs could be the trigger for government intervention to reduce public debt.

13.4 Empirical analysis results

In the third part of the chapter, we have focused on determining whether or not the factors identified in the previous section are successful in reducing public debt especially in periods of major public debt reduction. The aim is also based on an econometric model specification to identify the most successfully determinants and determine to what extent these contribute to debt reduction. Impact of these determinants to debt reduction success probability is analyzed in last section.

Empirical analysis focused on the success of fiscal activities was carried out mainly through research using logit or probit model specifications (dependent variable - the success or failure of activities) to determine the likelihood that the debt to GDP ratio will be reduced to the desired level (McDermott and Wescott, 1996). Determination of the success thresholds differs in many studies. Nickel *et al.* (2010) used the logistic model and the threshold of success was a reduction of at least 10% points in five consecutive years in terms of the implementation of the fiscal consolidation. Alesina and Perotti (1995) suggested reduction as success if in three years the debt/GDP ratio is 5

percentage point or lower, Alesina and Ardagna (2009) used cumulative debt/GDP indicator, reduction was considered as success if the improvement is greater than 4.5 percentage point. European Commission (2007) considered reduction as success if after three years the cyclically adjusted primary balance does not deteriorate more by more than 0.75% of GDP in cumulative terms. The definition of success is debt consolidation stabilization following the episode, with a couple of thresholds for the number of years after which stabilizes following a debt consolidation (three episodes) (Molnar, 2012).

In our research a successful consolidation is considered to be that, which ensures reduction in the public debt-to-GDP ratio of at least 6 percentage points in three consecutive years. Based on previous research for the probability identification a logistic model was used. The equation for the probability of success of fiscal consolidation is defined based on the results of previous research[147]:

$$P_i = E\left[S = 1 \middle| Z_i\right] = \frac{e^{Z_i}}{1 + e^{Z_i}} \tag{13.2}$$

where: $E = \left[S = 1 \middle| Z_i\right]$ is the conditional expectation of the success of a debt reduction, given Z_i, with S as a conditional parameter of probability. In case of major public debt reduction parameter S equal 1 and equal 0 in case of other reductions.

We can interpret equation (13.2) as the conditional probability that a major debt reduction occurs given Z_i, and Z_i is defined as follows (equation 13.3):

$$Z_i = \beta_0 + \beta_1 FB_i + \beta_2 PEXP_i + \beta_3 growth_i + \beta_4 gap_i + \beta_5 burden_i + \beta_6 Ir_i + \beta_7 FRI_i \tag{13.3}$$

where: FB_i is the sum of the primary balance in the two years prior to the debt reduction period.

$PEXP_i$ is a dummy variable, which controls for the composition of the fiscal adjustment, i.e. whether or not the change in primary expenditure is significant vis-à-vis the change in the primary balance. We construct the expenditure dummy as follows *(13.4)*. A fiscal adjustment is defined as expenditure based if at least λ percent of the change in the primary budget balance in percent of GDP comes from current expenditure cuts.

$$PEXP_t = \frac{1 \Rightarrow \left(\Delta PEXP_t / \Delta pb_t\right) > \lambda}{0 \Rightarrow otherwise} \tag{13.4}$$

where: $growth_i$ - represents the real trend growth computed by applying the Hodrick-Prescott-Filter on the real GDP growth series for each country under consideration over the period 1996-2014.

gap_i - represents the change in the output gap and is computed as the difference between real GDP growth and real trend growth.

$burden_i$ - represents the debt financing costs as a percentage of GDP. It is included in order to observe whether the interest burden has a stabilizing effect.

Ir_i - represents implicit interest rates.

[147] More details in Nickel et al. (2010)

FRI_i - a comprehensive time-varying fiscal rule index for each state was constructed by summing up all fiscal rule strength indices in force in the respective State weighted by the coverage of general government finances of the respective rule. Fiscal rules represent numerical fiscal rules, which specify numerical targets for key budgetary aggregates such as annual budget balance, expenditure, revenue, or debt.

Similarly was derived fiscal consolidation focused on the revenue side. By equation we have used similar manner defining revenue dummy variable REV_i, which is described as follows (equation 13.6):

$$Z_i = \beta_0 + \beta_1 FB_i + \beta_2 REV_i + \beta_3 growth_i + \beta_4 gap_i + \beta_5 burden_i + \beta_6 Ir_i + \beta_7 FRI_i \quad (13.5)$$

where: REV_i is a dummy variable which controls for the composition of the fiscal adjustment, whether or not the change in primary revenue is significant in the vis-à-vis the change in the primary balance. We construct dummy as follows:

$$REV_t = \frac{1 \Rightarrow (\Delta REV_t / \Delta pb_t) > \lambda}{0 \Rightarrow otherwise} \quad (13.6)$$

In the assessment of impact of fiscal consolidation, based on expenditure respectively revenue side, literature often indicates the existence of a combination of expenditure and revenue based consolidation. These are so called switching strategies, in which one type of consolidation may change over time to the second. In the model, we consider the existence of this type of strategy with a slight difference. We have defined the switching strategy as a combination of both revenue and expenditure based consolidation that can be applied at once, or can switch according the former definition. To identify the period with this switching strategy we have used a dummy variable. The first step by its construction was setting up the optimal λ threshold for the two dummy indicators responsible for consolidation type: $PEXP_i$ and REV_i. These λ values were identified using an optimization process applied to panel data of countries in the analysed period. Dummy variable switch strategy was then set as follows:

$$\begin{aligned}
&SWITCH_t = 1 \Rightarrow PEXP_i = 1 \wedge REV_i = 1 \\
&\wedge \\
&SWITCH_{t-1,t-2} = 1 \Rightarrow PEXP_{i-1} \wedge/\vee REV_{i-1} \wedge/\vee PEXP_{i-2} \wedge/\vee REV_{i-2} = 1 \\
&\wedge \\
&SWITCH_{t+1,t+2} = 1 \Rightarrow PEXP_{i+1} \wedge/\vee REV_{i+1} \wedge/\vee PEXP_{i+2} \wedge/\vee REV_{i+2} = 1 \\
&else \\
&SWITCH_t = 0
\end{aligned} \quad (13.7)$$

A. Empirical results

The estimation results of the equations (13.3), (13.5) and (13.7) are reported in this section. We have divided the estimations of model coefficients in several tables, depending on the specified λ threshold and also the analysis of the consolidation type. In this section we have analyzed the impact and significance of factors for debt reduction defined by the debt-to-GDP ratio.

B. Consolidation based on expenditure cuts

For the estimation of the model equation (13.3) we have used econometrical model based on panel data for the specified periods. Selection of the fixed effect panel linear model was supported with several tests comparing the suitability of chosen model. Using the F test we have rejected simple OLS model approach for our panel dataset. Hausman test also rejected the panel linear model with random effects, therefore the most suitable model with fixed effect of country variable was chosen.

Table 13.5 Estimations for PEXP Model with λ threshold 60% and 70%

Variable	Estimate	Pr(>|t|)	sig.
FB	-0.28201	0.08305	.
DRev	0.23977	0.33139	
Growth	-6.00649	2.2e-16	***
GAP	-0.30294	0.03645	*
Ir	8.50535	2.2e-16	***
Burden	-3.20717	1.858e-14	***
FRI	-0.69701	0.50381	
PEXP	-1.01359	0.52581	
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, R-Squared: 0.88537 , Adj. R-Squared : 0.74558			

Source: authors, calculated with statistics program R

For all estimates we provide the p value and also the significance level. As can be seen from the Table 13.5 the $PEXP_i$ dummy variable is not significant in the model represented by equation (13.3). Variable DRev representing the year on year change in revenues on GDP ratio is also not significant, so both variables for debt consolidation control are left out in this model. The FRI index responsible for fiscal rules control was identified as not significant. Most significant variables on debt reduction are growth ratio, implicit interest rates, interest burden and output gap. After adjustment of this model for significant variables only we get the equation with estimated coefficients β:

$$Zi \sim -0{,}29228\ FB - 5{,}90328\ Growth - 0{,}32750\ GAP + 8{,}40306\ Ir - 3{,}10547\ Burden \quad (13.8)$$

Table 13.6 Coefficients estimation for EXP threshold both 60% and 70%

FB	Growth	GAP	Ir	Burden
-0,29228	- 5,90328	- 0,32750	8,40306	- 3,10547

Source: authors, calculated with statistics program R

From the equation and also table can be suggested that the GDP growth had the heaviest impact on debt decrease. Increase of one percentage point in GDP growth had led to almost 6 percentage decrease in the public debt to GDP ratio. Also the increase of interest burden leads to decrease of the debt-to-GDP ratio, what looks a bit confusing if we don't consider that the debt can be paid, or refinanced by market participants who will refinance the debt by claiming additional increase in bond interest rates. This would also increase the interest burden of the country in current and few next years.

Changing the λ threshold from 60% to 70% had no effect on the $PEXP_i$ dummy variable, so there would be no change in the estimation or the estimated equation. Therefore no additional analysis was carried out.

C. Consolidation based on revenue increase

In this section we are looking at the estimation of the model equation (13.5) which is constructed to control for the effect revenue based consolidation. As in the model before have we used the same procedure also here. Selection of the fixed effect panel linear model with individual effect was supported with several tests comparing the suitability for the chosen model. Analysis on the country and time effect has rejected fixed effect model with time effect, and suggested fixed effect model, with equal effects distributed among countries. Rejection of the random effect model was supported by the Hausman test. In this case the change in the λ threshold for revenue dummy variable had a significant effect in model equation estimation.

Table 13.7 Estimations for REV model with λ threshold 60%

Variable	Estimate	Pr(>|t|)	sig.
FB	-1885.57730	0.65108	
DExp	-1885.26258	0.65114	
DRev	1885.49893	0.65110	
Growth	-5.96502	2,00E-16	***
GAP	-0.31195	0.02598	*
Ir	8.32705	2,00E-16	***
Burden	-3.04630	2,00E-16	***
REV	-1.90516	0.04080	*
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, R-Squared: 0.89093, Adj. R-Squared : 0.75026			

Source: authors, calculated with statistics program R

Table above shows the estimated β coefficients for referred variables and also the p value with corresponding significances. As can be seen the variables for controlling the Fiscal Balance, change in expenditure and change in revenues seem to be not contributing to the debt reduction. All other variables are identified as significant. After another adjustment of the model and elimination of least significant variables we got final estimated model equation:

$$Zi \sim FB + Growth + GAP + Ir + Burden + REV \quad (13.9)$$

Table 13.8 Coefficients estimation for REV threshold 60%

FB	Growth	GAP	Ir	Burden	REV
-0.25204	-5.92902	-0.32499	8.25149	-3.06791	-2.03495

Source: authors, calculated with statistics program R

From the table and equation estimated coefficients can be observed strong significance and impact of GDP growth and Implicit Burden ratio on debt reduction. Our results suggest that the implementation of sound macroeconomic and structural policies promoting growth is crucial for a major debt reduction because it helps countries to "grow their way out" of indebtedness. Other

significant coefficients have similar effect as for the econometric model used for expenditure based consolidation analysis. In this case the dummy variable used for control of the consolidation type remained significant in the model. From this conclusion we can estimate al least an existing relationship between the change in the revenue side of the fiscal balance and the debt reduction ratio. Our results suggest that the composition of the fiscal adjustment plays an important role in explaining the success of a debt reduction. From the dummy variable REV_i construction, which reflects the size of the change in the primary expenditure relative to the change in the primary balance, we can also suggest that a revenue based consolidation could be an option in debt reduction in these four countries during the time period from 1996-2014.

After adjustment of the λ threshold for the REV_i dummy variable to 70% the model estimation changed only slightly. The changed estimations of significant variable coefficients and the resulting model are shown below.

$$Zi \sim FB + Growth + GAP + Ir + Burden + REV \quad (13.10)$$

Table 13.9 Coefficients estimation for REV threshold 70%

FB	Growth	GAP	Ir	Burden	REV
-0.24167	-5.88620	-0.31780	8.29374	-3.11191	-1.78087

Source: authors, calculated with statistics program R

Although the dummy condition was set stronger (threshold raised by 10%), model estimation changed only slightly. Therefore we can assume that the consolidation based on revenue can play a crucial role by debt reduction.

D. Consolidation based on switching strategies

Fiscal consolidation is often analyzed from only two approaches, derived from the state fiscal balance and they are either expenditure or revenue based. Several authors like Von Hagen *et al.* (2002) have identified, that a not insignificant number of countries used a so called "switching strategy" during fiscal consolidation process. Those strategies are a combination of the expenditure and revenue based fiscal consolidation over specified time period. At the beginning of the strategy government can rise taxes/or decrease investments and subsequently expand the strategy by decreasing current expenditures.

For identification of such episodes of potential switching strategies a dummy variable $SWITCH_t$ was identified according the condition (13.7). After panel regression linear model application several significant variables estimation were identified. In this model Hausman test rejected the random effect model, therefore we have used the panel linear regression model with fixed effects.

Table 13.10 Estimations for SWITCH model

Variable	Estimate	Pr(>|t|)	sig.
FB	-0.22860	0.08906	.
DRev	0.24903	0.20499	
Growth	-6.33664	2.2e-16	***
GAP	-0.25994	0.02863	*
Ir	8.13638	2.2e-16	***
Burden	-2.72480	2.2e-16	***
SWITCH	-4.09113	6.381e-07	***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, R-Squared: 0.92054, Adj. R-Squared : 0.78731			

Source: authors, calculated with statistics program R

As can be seen from the table above dummy variable for switching strategies is very significant, and strongly contributes to debt reduction. The discrete change of the dummy variable from 0 to 1, representing the switching strategies implementation, produces decrease in the debt-to-GDP ratio of 4 percentage points. If we consider also the results from equation (13.5) estimation, we can suggest that the revenue based fiscal consolidation supported by expenditure cuts is a significant strategy in debt reduction. These assumptions are supported also by the estimated coefficient for fiscal balance, where the increase of positive fiscal balance-to-GDP ratio would lead to debt reduction. Interest burden and implied implicit rates had similar significance and effect as described from the previous models. After the elimination of insignificant variables, the final equation with estimated coefficients is described below.

Table 13.11 Coefficients estimation for SWITCH dummy model

$$Zi \sim FB + Growth + GAP + Ir + Burden + SWITCH \qquad (13.11)$$

FB	Growth	GAP	Ir	Burden	SWITCH
-0.22860	-6.33664	-0.25994	8.13638	-2.72480	-4.09113

Source: authors, calculated with statistics program R

After adjustment the GDP Growth and Burden still remained the striking factors for debt reduction. The model and estimations are very similar to the REV model described before. Considering the significance of the revenue based consolidation we can assume that the consolidation using switching strategies mostly started and also ended by stronger revenue based consolidation supported by expenditure cuts in the middle of the consolidation.

E. Conclusion on models estimation

Results from model estimation based on dummy variable responsible for control the expenditure based consolidation suggest that this type of consolidation had no significant effect on debt-to-GDP ratio decrease. Changes in the λ threshold had no effects on the results.

On the other hand when estimating models with dummy variable for revenue based consolidation control, the significance of the dummy was at least on significance level α=0.1. From these results we can suggest that the fiscal consolidation in V4 countries could be driven by changes

on the revenue side of fiscal balance. These assumptions are in line with the research carried out by OECD (2007) which indicates that the increase in revenues represented in average larger proportion of the total reduction in budget position. European Commission (2011) underlined the importance of revenue budget side.

These assumptions are also supported by model estimation considering switching strategies. In this case a combination of revenue and expenditure fiscal consolidation is considered. Significance of this dummy variable suggested that in V4 countries during the analyzed time frame the fiscal consolidation was based on adjusted switching strategies[148]. The discrete change of the dummy variable from 0 to 1, representing the switching strategies implementation, produced decrease in the debt-to-GDP ratio of 4 percentage points.

F. Probability of consolidation success

Using the econometric model identified in the previous section based on truncated panel data we have constructed logistic probability model defined by previous research (13.2). Objective of this section is the determination of factors that contributed significantly to the probability of consolidation success. Model and coefficient estimation describes the table below.

Table 13.12 Estimations for probability model

Variable	Estimate	Pr(>|t|)	sig.
Growth	-0.094298	0.016701	*
Ir	0.382061	2.820e-07	***
Burden	-0.198951	4.116e-06	***
PEXP	0.225935	0.001642	**
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, R-Squared: 0.92575, Adj. R-Squared : 0.644			

Source: authors, calculated with statistics program R

Selection of the fixed effect panel linear model was supported with several tests comparing the suitability of chosen model. Using the F test we have rejected simple OLS model approach for our panel dataset. Hausman test also rejected the panel linear model with random effects, therefore the most suitable model with fixed effect of country variable was chosen. Final equation for this panel linear model with corresponding coefficients estimation is described below.

$$Pi \sim Growth + Ir + Burden + PEXP \quad (13.12)$$

Table 13.13 Coefficients estimation

Growth	Ir	Burden	PEXP
-0.094298	0.382061	-0.198951	0.225935

Source: authors, calculated with statistics program R

From the Table 13.13 can be seen that as significant variables contributing to probability of consolidation success only one dummy variable controlling the type of consolidation remained. Our results suggest that the composition of the fiscal adjustment plays an important role in explaining the

[148] For further information see section 3 and dummy variable definition

success of a debt reduction. These results are at the first side inconsistent with the results for debt reduction model analysis. The expenditure dummy which reflects the size of the change in the primary expenditure relative to the change in the primary balance has the expected positive sign and is statistically significant. It means that the discrete change in the variable from 0 to 1 would increase the probability of major debt reduction success about 22 percentage points. On the other hand, the revenue dummy variable turns out to be statistically insignificant. Therefore, it seems that expenditure-based consolidations have a higher probability to succeed. Another factor which determines the success of a debt reduction is the interest burden. It turns out to be statistically significant and has a negative sign. A one percent increase in the interest burden decreases the probability of a major debt reduction by 9 percentage points. A decrease in the burden would decrease the debt servicing costs what would positively affect the consolidation success.

13.5 Conclusion

The evolution of European countries' indebtedness shows increasing public finance deficit tendency that had emerged from about the 70th. The debt problem has become the basis of current crisis in the most countries. Dealing with the consequences of systemic crisis, which is characterized by the long-term fiscal imbalance deepening is the theme "number one" in academic and expert circles as well as in international institutions. Therefore empirical studies and real national governments focus on the implementation of fiscal consolidation that would reduce public debt as much as possible.

All the V4 countries have to undertake policy measures to reverse the trend of rising debt ratios. Therefore, the question of how to successfully reduce public debt is of eminent interest. According to this situation, the main focus of this chapter was identification and comparison of revenue and expenditure based consolidation and was performed in several stages.

Using the specified methodology several episodes of public debt accumulation, public debt major and modest reduction were identified. Three of four countries experienced episodes of major debt reduction over the analyzed time frame. Next step was model specification based on theoretical and empirical evidence in order to identify factors, which in related periods influenced the major part of debt reduction and debt accumulation in Visegrad countries.

Based on the estimation of different specifications of a logistic probability model over the period 1996-2014, our results indicate that especially the real trend GDP growth, the interest burden and also the composition of the fiscal adjustment are crucial factors in explaining the success of a debt reduction. Several dummy variables were designed for the control of the fiscal consolidation type. When assessing the significance of success on debt reduction, expenditure based consolidation was suggested as the driving factor. Although the switching strategies consolidation played a significant role for major and modest debt reduction, revenue based consolidation looks like insignificant when considering the probability of consolidation success.

Future research could mainly cover the topics for the identification of described fiscal consolidation component types, which contribute to the increase of debt reduction probability in countries V4.

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Chapter 14

DEVELOPMENTS IN MODELS OF MAJORITY VOTING OVER FIXED INCOME TAXATIONS

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DEVELOPMENTS IN MODELS OF MAJORITY VOTING OVER FIXED INCOME TAXATIONS

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Abstract

As public debt becomes an acute problem for western economies, the political debate becomes more and more dominated by issues related to the need of increasing the progressivity of taxation. In order that one better understands the current context, it is necessary, in our view, to become familiar with the literature of the positive theory of income taxation. This literature regards the tax schemes in democratic societies as emerging from majority voting.

The aims of this chapter are the following. First, we briefly review the most important results in the above mentioned literature, trying to explain the empirical regularities of taxations. Second, based on previous work, we discuss how standard equilibrium concepts from simple majority voting games in coalitional form (e.g. core, ε-core and least core) can be adapted to the general setup of voting over income tax schedules, as well as the conditions under which such adapted concepts are stable. Third, we investigate which are the implications of these concepts, from the perspective of progressivity versus regressivity, for workhorse models of the positive theory of income taxation (e.g. with restricted policy spaces such as quadratic taxation models, piecewise linear taxation models, etc.).

Finally, we provide a brief critical evaluation of the extent to which this approach is able to address the difficulties acknowledged by the literature in the field and we draw future lines of investigation (such as possible adaptations of Mas-Colell Bargaining Set to the setup of voting over income tax schedules).

Keywords: public finance, progressive taxation, majority voting.

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14.1 Introduction

One of the main features of the current crisis of the western European economies is represented by the soaring public debt. And as public debt becomes an acute problem, it seems that in the political debate and in the space of public discussions of the western countries, issues like widening income gaps and more progressive taxation are gaining in importance.

Apparently, after many years of stability of tax systems, in which taxation issues were peripheral within the political debate, nowadays we can witness a political scene animated by proponents and condemners of raising tax rates for the rich. Moreover, an increasing number of western governments seem eager to be the first to take steps towards new levies for the highest earners, even if for the moment we can only talk about their symbolic significance.

Given such political scenes dominated by discussions on taxation issues, do we witness the end of a long period of an apparent stability of tax schedules? Have these governments become more predisposed to progressivity, as they try to maximize a social welfare function under the constraints of raising income inequality and the objective of decreasing the public debt? Or are the governments (or other political actors) simply driven by electoral calculations, given the increasing right-skewness of the income distributions? In our view, in order that one better understands the current context and the discussions about taxing the wealthy, it is necessary to become familiar with the literature of the positive theory of income taxation.

Part of the literature in the positive theory of income taxation is concerned with explaining important empirical stylized facts that regard the tax schedules. The first empirical regularity refers to the stability of the tax schedules in democratic societies (see Grandmont, 2006; Marhuenda and Ortuño-Ortin, 1998). The second well-documented empirical fact is that industrialized democracies (in particular, all OECD countries) usually implemented statutory income tax schedules with marginal rates that are increasing in income (see Carbonell-Nicolau and Ok, 2007; Carbonell-Nicolau and Klor, 2003). The tax functions with marginal rates increasing in income are called *marginal-rate progressive* in public finance. In fact, these are tax functions which are convex from mathematical point of view. The concave tax schedules are called *marginal-rate regressive*.

According to Grandmont (2006), the main assumption on which the positive theory of income taxation builds is that tax schemes are emerging, explicitly or implicitly, from majority voting. Carbonell-Nicolau and Ok (2007) assert that the income tax policy is one of the most important traits of a political candidate. Therefore, one should expect that the above mentioned stylized facts reflect, not necessarily in a direct manner, the preferences of the majority of the constituents of the democratic societies (Carbonell-Nicolau and Ok, 2007). Within the same logic, one can extend to the public choice of tax schedules the following idea of Roberts (1977): “the point is not whether choices in the public domain are made through a voting mechanism but whether choice procedures mirror some voting mechanism” (also cited by Marhuenda and Ortuño-Ortin, 1995). An alternative approach to the positive theory of income taxation starts from the assumption that the tax designer intends to maximize some utilitarian social welfare function. Nevertheless, the present work and the referred literature subscribes to the former approach, which is the positive economic theory of income taxation.

The literature in the area is still inconclusive on the relationship between majority voting and the mentioned stylized facts. There are few main difficulties that the researchers have to face. First, a very important difficulty is that the Condorcet majority winner is not usually guaranteed because the policy space of tax schedules is multidimensional (the multidimensionality remains true even for very restrictive policy spaces). The possible inexistence of a Condorcet winner can be regarded as predicting political instability with respect to the taxation system to be agreed on, which is in contradiction with the empirical evidence (see Grandmont, 2006; Marhuenda and Ortuño-Ortin, 1998).

A second difficulty resides in the fact that deriving the properties of the stable taxes is mathematically cumbersome when there are used equilibrium concepts other than the Condorcet winner. As noted before, by restricting the policy space or considering solution concepts different than the Condorcet winning tax, one can guarantee the existence of the set of equilibrium taxations. However, even in such cases, the analytical description and derivation of the properties of the set of stable taxations proves to be mathematically cumbersome. Therefore, in many instances, the state of the art literature in the field of positive theory of income taxation has limitations. It should resort either to numeric simulations of the solutions (e.g. De Donder and Hindriks, 2003; Marhuenda and Ortuño-Ortin, 1998) and/or to restrictions on the policy space or on the income distributions (e.g. Roemer, 1999; De Donder and Hindriks, 2003, 2004; Curt, Litan and Filip, 2010, 2011). Nevertheless, such restrictions are difficult to motivate in real life.

A third difficulty is that the literature usually considers solution concepts that are intrinsically static, while the stability of taxes is empirically proved in the context of much dynamicity (e.g. consecutive electoral cycles in which the same parties will present themselves repeatedly in front of the same electorate). In this context, most of the literature suffers from the limitation that it applies quite static equilibrium concepts. For example, the following papers build around the idea of a status-quo tax function: Marhuenda and Ortuño-Ortin (1995, 1998), De Donder and Hindriks (2003, 2004), Curt, Litan and Filip (2010, 2011, and 2011a).

The aims of this work are the following. First, we briefly review the most important results in the literature trying to explain the empirical regularities. This brief literature review is presented in relationship with the above mentioned difficulties. Second, we discuss how standard equilibrium concepts from simple majority voting games in coalitional form can be adapted to the general setup of voting over income tax schedules. Third, we discuss the conditions under which such adapted concepts are stable. Moreover, we investigate which are their implications from the perspective of progressivity versus regressivity, for workhorse models of the positive theory of income taxation, with restricted policy spaces (e.g. quadratic taxation models, piecewise linear taxation models, etc.). Finally, we provide a brief critical evaluation of the extent to which this approach is able to address the above mentioned difficulties and we draw future lines of investigation.

This chapter is organized as follows. Section 14.2 contains the literature review. Section 14.3 presents the general model of voting over income tax schedules and defines the concepts of core, ε-core and least core based on the previous work of the authors (Curt, Litan and Filip, 2010, 2011 and 2011a). Section 14.4 provides a critical view on the implications of the concepts of core and least core, making references to previous results of the authors. In Section 14.5 we discuss possible

adaptations of Mas-Collel Bargaining Set to the setup of voting over income tax schedules and we draw the conclusions.

14.2 Literature review

Inexistence of Condorcet winner, possible ways out followed in the literature, their limitations

As already mentioned, an important difficulty is that the Condorcet majority winner is not usually guaranteed because the policy space of tax schedules is multidimensional. Possible ways out followed in the literature are summarized below.

Romer (1975, 1977) and Roberts (1977) analyze the outcome of majority voting when tax policies must be linear functions of income. Snyder and Kramer (1988) admit only tax functions which are individually optimal for some voter. In the same direction, Cukierman and Meltzer (1991) impose some tax to be ideal for some voter. Starting with Cukierman and Meltzer (1991), and continuing with Roemer (1999), Hindriks (2001) and De Donder and Hindriks (2004), all these authors restrict their analysis only to quadratic taxations. Marhuenda and Ortuño-Ortin (1995) consider as policy space a subset of only convex and concave tax functions (case that includes the quadratic functions).

In the literature, besides restricting the policy space, another proposed way out from the difficulty of not having guaranteed a Condorcet winner is to consider less demanding stability concepts. Marhuenda and Ortuño-Ortin (1998) introduces uncertainty about the tax liability of a new proposal. Roemer (1999) defines a new equilibrium concept based on the need to reach an intra-party agreement between the “opportunists” and the “militants” of two competing parties. De Donder and Hindriks (2003) introduce preferences for leisure and depart from the assumption of fixed income (in the sense that the income will be an implicit function of taxation). However, even in such cases, in order to obtain insightful results, the authors were finally obliged to restrict the policy space (for example, to quadratic taxations).

A different approach is proposed by Carbonell-Nicolau and Ok (2007). They allow for mixed strategies over the set of admissible taxes, when there are two parties in competition. Nevertheless, it is conceptually problematic to interpret a mixed equilibrium in the context of income taxation.

A conclusion that may already be drawn is that the literature on income taxation usually substitutes the Condorcet winner concept with other stability (or equilibrium) concepts, since the majority winner tax does not usually exist, except under very strong and unrealistic restrictions imposed on the policy space. Nevertheless, even when using other concepts than Condorcet majority winner, the existence of the equilibrium taxes can be proved only for quite restrictive policy spaces.

Results regarding the prevalence of progressivity and their limitations

Regarding the prevalence of progressivity in democratic societies, Snyder and Kramer (1988) assess the existence of progressivity in an economy in which grey and white sectors coexist. However, as mentioned before, they consider only tax functions which are individually optimal for some voter, hence their result is limited. Cukierman and Meltzer (1991) provide quite strong sufficient conditions under which the Condorcet winner is progressive. Marhuenda and Ortuño-Ortin (1995) prove that for right-skewed income distributions any concave tax scheme receives less popular support than any convex tax scheme. Still, the result is limited subject to their considered space of

convex and concave tax functions (which is strictly included in the space of all feasible convex and concave functions).

As mentioned before, Carbonell-Nicolau and Ok (2007) provide a two-party voting game in which each party whose objective is to win the elections proposes tax schemes from an unrestricted set of admissible functions and the voters selfishly vote for the tax that taxes them less. They establish the existence of only mixed equilibria and find that if the tax policy space is not artificially constrained, the support of at least one equilibrium cannot be obtained within the set of marginal-rate progressive taxes. This result is in the same line with the one of Klor (2003), who shows that a majority of poor voters does not necessarily imply progressive taxation for a more general policy space than the one in Marhuenda and Ortuño-Ortin (1995). The results of Klor (2003) and Carbonell-Nicolau and Ok (2007) are essentially negative news for those with the common belief that the prevalence of progressivity is nothing just a simple consequence of the fact that the number of relatively poor voters exceeds that of richer voters in general.

Roemer (1999) limits his analysis to the quadratic taxation framework and obtains progressivity for the alternative equilibrium concept he defines. In the same setup of fixed income (i.e. income not distortioned by taxes) and quadratic taxations à la Roemer (1999), Hindriks (2001) establishes the inevitable vote cycling theorem. He concludes that the result of Marhuenda and Ortuño-Ortin (1995) has no predictions even in the simplest imaginable case of only convex and concave functions, which is the policy space of quadratic taxations. De Donder and Hindriks (2003) introduce preferences for leisure in the quadratic taxation model, study the voting process over tax schedules using an alternative political equilibrium concept than the Condorcet winner, and prove progressivity only simulations-based.

Therefore, a conclusion that may be drawn is that the link between right-skewed income distributions and progressive taxations, through the democratic institution of majority voting, cannot be established without imposing the same unrealistic restrictions on the policy space. And when such restrictions are not imposed, the existing results in the literature are rather negative from the perspective of the heuristic argument that the prevalence of progressivity is nothing just a simple consequence of the fact that the number of relatively poor voters exceeds that of richer voters.

The limitation regarding the use of static equilibrium concepts

Most of the referred literature considers, in a way or another, solution concepts that are intrinsically static. From this point of view, there are no clear differences between the cases in which Condorcet winner exists and those cases in which alternative concepts are applied. Hence, in our view, the possible critique mentioned by Grandmont (2006) about the Condorcet winner concept may be reiterated for most of the alternative concepts reviewed before (even if they provide non empty sets of equilibrium taxations): “It may be claimed that the political instability predicted by the possible inexistence of a Condorcet majority winner relies upon a very myopic behavior of voters, who are assumed to vote against the current tax schedule and for a new tax proposal if and only if they gain in the short run from the corresponding change. One may argue that in a dynamic setting, voters are likely to be more forward looking and that "political conservatism" may arise in the sense that a majority of voters may not wish to vote against the status quo even though they would gain

immediately from the change, because they fear that doing so would start a political escalation that would be harmful to them".

The next sections will discuss how standard equilibrium concepts from simple majority voting games in coalitional form can be adapted to the general setup of voting over income tax schedules. Moreover, we shall critically analyze the implications of such adapted concepts from the perspective of the three dimensions along which the above literature review was conducted. The next sections are mainly based on the previous work of the authors (see Curt, Litan and Filip, 2010, 2011 and 2011a).

14.3 General setup (definitions and terminology)

The General model

The economy consists of a large number of individuals who differ in their (fixed) income. Each individual is characterized by her income $x \in [0,1]$. The income distribution can be described by a function $F: [0,1] \to [0,1]$, continuous and differentiable almost everywhere and increasing on the interval $[0,1]$. Each individual with income $x \in [0,1]$ has strictly increasing preferences on the set of her possible net incomes. The associated Lebesque-Stieltjes probability measure induced by F is denoted by $\nu(S)$ and for any Lebesque-Stieltjes measurable set $S \subseteq [0,1]$:

$$\nu(S) = \int_S \mathrm{d}F(x) \tag{14.1}$$

The fixed amount:

$$0 \leq R < \bar{y} = \int_{[0,1]} \mathrm{d}F(x) \tag{14.2}$$

should be collected through means of a tax imposed on the agents. When $R = 0$, the tax is purely redistributive. It is assumed that there is no tax evasion, respectively there are no distortions induced by the taxation system in the economy. In one word, the pre-tax income is fixed (in the sense that it is given and not influenced by the taxation system).

A set of admissible tax schedules $U = U(F, R)$ contains functions t continuous on $[0,1]$ that necessary satisfy, for a given F and R, the following conditions:

$$t(x) \leq x, \forall 0 \leq x \leq 1; \tag{14.3}$$

$$t(x_1) \leq t(x_2), \forall 0 \leq x_1 \leq x_2 \leq 1; \tag{14.4}$$

$$x_1 - t(x_1) \leq x_2 - t(x_2), \forall 0 \leq x_1 \leq x_2 \leq 1; \tag{14.5}$$

$$\int_{[0,1]} t(x)\mathrm{d}F(x) = R. \tag{14.6}$$

It is noteworthy that the continuity of t is actually implied by the conditions (14.4) and (14.5). Moreover, the tax functions that satisfy the conditions (14.3)-(14.6) are uniformly bounded by the constant 1. Another important remark is that there is no tax evasion, respectively there are no

distortions induced by the taxation system in the economy. Thus, the pre-tax income is considered *fixed* (in the sense that it is given and not influenced by the taxation system).

An example of a restricted policy space that is extensively used is the one of the quadratic taxations. The space $QT(F,R)$ contains those functions:

$$t\colon [0,1] \to (-\infty, 1],\ t(x) = ax^2 + bx + c \tag{14.7}$$

such that:

$$t(x) = ax^2 + bx + R - a\bar{y}_2 - b\bar{y} \qquad \text{and} \qquad \begin{cases} 0 \le b \le 1, \\ 0 \le 2a + b \le 1. \\ a\bar{y}_2 + b\bar{y} \ge R \end{cases} \tag{14.8}$$

In the above formulas, $\bar{y}_2$ is the non-centred moment of the second order of the income distribution.

Condorcet winners and the core

Let $U = U(F,R)$ be a set of admissible tax schedules. Given a tax $t \in U$, a tax policy $q \in U$ is an *objection* to t if and only if:

$$v\{x \in [0,1]\colon q(x) < t(x)\} > v\{x \in [0,1]\colon q(x) > t(x)\}. \tag{14.9}$$

That means:

$$v\{x \in [0,1]\colon q(x) < t(x)\} \ge \tfrac{1}{2}, \tag{14.10}$$

thus the tax q is (weakly) preferred by a majority of individuals to the tax t. Denote with $\mathrm{Obj}_U(t)$ the set of all objections to the taxation t. Hence, t is a Condorcet winner or a majority winner if and only if there is no objection to it, i.e. $\mathrm{Obj}_U(t) = \emptyset$ (see Curt, Litan and Filip, 2010, 2011 and 2011a).

As in Grandmont (2006), we consider the simple majority game in coalitional form corresponding to the general setup just described. Then, the set of the Condorcet winners is nothing else just the core. Moreover, the inexistence of a Condorcet majority winner is equivalent to the fact that the core is empty.

ε-core and least core

Given tax policies $t, q \in U$, we can construct the distance:

$$d(t,q) = \int_{\{x \in [0,1]\colon q(x) < t(x)\}} \big(t(x) - q(x)\big)\mathrm{d}F(x). \tag{14.11}$$

As economic interpretation, this distance represents the total gain of those individuals that are better off if the tax schedule changes from *t* to *q*. It can be immediately proved that the distance is

equal to $\frac{1}{2}\int_{[0,1]}|t(x)-q(x)|\mathrm{d}F(x)$. Moreover, a very important property is that $d(t,q)$ is a metric. It represents the restriction to the tax function space U of the L^1 metric,

$$\|t-q\|_1=\int_{[0,1]}|t(x)-q(x)|\mathrm{d}_\nu(x)=\int_{[0,1]}|t(x)-q(x)|\mathrm{d}F(x). \quad (14.12)$$

In the metric space $L^1([0,1],\nu)$, the following convention applies: $t=q$ if and only if $t(x)=q(x)\ a.e.$. The same convention applies to the space of interest U. Having all this terminology at hand, we can now define the concepts of ε - core and least core in the majority game in coalitional form associated to the general setup described above.

Given $\varepsilon>0$, we define $C(\varepsilon)$ as the set that contains all the taxes for which there is no objection such that the total gain of the better off agents under the objection is strictly greater than ε. The set $C(\varepsilon)$ represents the ε - *core* and it can be economically interpreted as containing any tax for which the maximal willingness (that can arise from the agents of the economy) to pay to change this given tax is less or equal than ε.

The *least core* is defined as containing any tax such that the maximal willingness (that can arise from the agents of the economy) to pay to change this given tax is minimal between all taxes. It is the intersection of all ε - *core* that are not empty, i.e., $\bigcap_{\{\varepsilon>0:C(\varepsilon)\neq\emptyset\}}C(\varepsilon)$.

The adaptation of the concepts of ε - core and least core to the setup of voting over (fixed) income taxations is introduced by Curt, Litan and Filip (2011). However, the paper of Grandmont (2006) represents another use of the concept of least core in the literature of voting over income repartitions. Grandmont (2006) argues that in his setup voting over tax schemes is equivalent to voting directly over income distributions. Nevertheless, the setup on which this work is focused is not à la Grandmont (2006); like most of the literature does, we impose fairness principles to the tax schedules, i.e. a tax is increasing with the revenues in such a way that it does not change the post-tax income ranking.

In a majority game in coalitional form of voting over income distributions, Grandmont (2006) proves the usual result that the core is empty. Moreover, in his framework, the least core implies no insights as well, since it contains just the egalitarian income distribution, in the case it is not empty. However, the results of Curt, Litan and Filip (2010, 2011a, 2011), which will be presented in the next section, reveal that the adaptation of the concepts of core, ε - core and least core to the setup of voting over (fixed) income taxations provide interesting insights (as opposed to the framework in Grandmont, 2006).

14.4 The results - a critical evaluation

Results

Curt, Litan and Filip (2010) extend the work of De Donder and Hindriks (2004) and provide a complete description of those income distribution functions for which a majority winning tax exists (or does not exist), if the quadratic taxation model is not purely redistributive. They also provide necessary and sufficient conditions for the Condorcet winner tax to be progressive (if this majority winning tax exists). In a direct relationship with Curt, Litan and Filip (2010) is the short paper Curt, Litan and Filip (2011a). In this work the authors provide a specific proof that the sufficient condition of

De Donder and Hindriks (2004) can be relaxed to a broader one, also for purely redistributive taxations. It is consequently shown how the sufficient and necessary conditions should modify accordingly.

As already mentioned, Curt, Litan and Filip (2011) is one of the first papers to pilot the idea of applying "cooperative" concepts like ε - core and least core to standard models of majority voting over (fixed) income taxations. Section 14.3 in here closely follows the paper of Curt, Litan and Filip (2011) in which the authors mathematically defined the concepts of ε - core and least core for the general setup of majority voting over fixed-income taxations. In particular, they show that the least core is not empty for the framework of quadratic taxation, respectively piecewise linear tax schedules. Moreover, for fixed-income quadratic taxation environments with no Condorcet winner, they prove that for sufficiently right-skewed income distribution functions, the least core contains only taxes with marginal-rate progressivity. All these results are formally introduced to the reader in the following of this text.

The next proposition states two important properties of the least core. First, in the case the core is not empty, the least core reduces to the core concept. Second, the taxes in the least core can be found by solving a *min sup* problem expressed in terms of the distance *d*. As already noticed by Curt, Litan and Filip (2011), these results are in line with several properties that the least core has for discrete policy spaces (see Einy *et al.*, 1999).

Proposition 1 (Curt, Litan and Filip, 2011)

Let U be a set of a tax function that satisfies the conditions (14.3)-(14.6). If the set $\bigcap_{\{\varepsilon>0:C(\varepsilon)\neq\emptyset\}} C(\varepsilon)$ is not empty then the following assertions are true:

- If we denote by $\underline{\varepsilon} = inf_{\{\varepsilon>0:C(\varepsilon)\neq\emptyset\}}\varepsilon$, then $\bigcap_{\{\varepsilon>0:C(\varepsilon)\neq\emptyset\}} C(\varepsilon) = C(\underline{\varepsilon})$;
- $\underline{\varepsilon} = inf_{t\in U} sup_{q\in Obj_{U(t)}} d(t,q)$;
- $\underline{\varepsilon} = 0$ if and only if $\bigcap_{\{\varepsilon>0:C(\varepsilon)\neq\emptyset\}} C(\varepsilon)$ is the set of Condorcet majority winners;
- $inf_{t\in U} sup_{q\in Obj_{U(t)}} d(t,q) = min_{t\in U} sup_{q\in Obj_{U(t)}} d(t,q)$.

The next theorem is very important since it provides quite general sufficient conditions such that the concept of least core does not provide empty sets of taxations.

Theorem 1 (Curt, Litan and Filip, 2011)

Let U be a set of tax functions that satisfy the conditions (14.3)-(14.6). Consider that *F* is an income distribution function that is absolutely continuous and the density function is almost everywhere continuous. If the set U is complete with respect to metric *d*, then $\bigcap_{\{\varepsilon>0:C(\varepsilon)\neq\emptyset\}} C(\varepsilon)$ is not empty. The next result focuses on the quadratic case. Before, additional terminology is needed. Let:

$$h\colon [0,\mu] \to \mathbb{R},\ h(x) = ux^2 + vx - u\bar{y}_2 - v\bar{y},\ u \in \mathbb{R}^*, v \in \mathbb{R} \tag{14.13}$$

and let:

$$\alpha = -\frac{v}{2u\bar{y}} \tag{14.14}$$

Then, for each $\alpha \in \mathbb{R}$, the quadratic function h has two real roots:

$$x_1(\alpha) = \alpha\bar{y} - \sqrt{(\alpha-1)^2\bar{y}^2 + \sigma^2} \tag{14.15}$$

and:

$$x_2(\alpha) = \alpha\bar{y} + \sqrt{(\alpha-1)^2\bar{y}^2 + \sigma^2}, \tag{14.16}$$

which vary as function of α, *where:*

$$y_1 = 1 - \sqrt{(1-\bar{y})^2 + \sigma^2} \text{ and } y_2 = \sqrt{\bar{y}_2}. \tag{14.17}$$

The conditions on the income distribution function for the existence/non-existence of a majority winning tax are expressed in terms of $x_1(\alpha)$ and $x_2(\alpha)$ in De Donder and Hindriks (2004), respectively in Curt *et al.* (JIA, 2010).

Theorem 2

Let F be a distribution function such that $1 - \sqrt{(1-\bar{y})^2 + \sigma^2} < y_m < \bar{y}$.

- *Curt, Litan and Filip (2010): If $F\left(\frac{\bar{y}_2}{\bar{y}}\right) - F\left(\frac{\bar{y}-\bar{y}_2}{1-\bar{y}}\right) < \frac{1}{2}$ and there is $\alpha_0 \in \left(\frac{\bar{y}_2}{2\bar{y}^2}, \frac{1-\bar{y}_2}{2\bar{y}(1-\bar{y})}\right)$ such that $F\big(x_2(\alpha_0)\big) - F\big(x_1(\alpha_0)\big) < \frac{1}{2}$, then the core is empty (there is no Condorcet majority winner);*
- *Curt, Litan and Filip (2011): If in addition to the above conditions, $F\big(x_2(\sigma)\big) - F\big(x_1(\sigma)\big) > \frac{1}{2}$ for each $\alpha \in \left(\frac{\bar{y}_2}{\bar{y}}, \frac{1}{2\bar{y}}\right]$, then the set $\bigcap_{\{\varepsilon>0:C(\varepsilon)\neq\emptyset\}} C(\varepsilon)$ contains only progressive tax functions.*

The general message of the second part of Theorem 2 is that for sufficiently right-skewed distributions, in the least core there are only progressive taxations.

Brief critical evaluation of the results

Regarding Theorem 1, the result is quite general as many of the distribution functions used to model the repartition of income among the individuals of a society have the required properties (see for instance the beta distributions in De Donder and Hindriks, 2003, 2004, or the examples of income distribution functions from Carbonell and Ok, 2007). Moreover, it can be immediately applied to policy spaces which are extensively used in the literature, like the case of quadratic taxations or the case of piecewise linear tax schedules.

Nonetheless, the result has the limitation that it crucially depends on the continuity assumption of the incomes and income distribution. Indeed, there is no clear way the result can easily be adapted to the (more realistic) case of a discrete set of income values and *F* discrete (Moreno-Ternero, 2011) is one of the very few papers that works with discrete income distributions).

Theorem 2 can be interpreted as positive news for those with the common belief that the prevalence of progressivity is nothing just a simple consequence of the fact that the number of relatively poor voters exceeds that of richer voters in general. However, we can conclude that the result suffers from the same limitations we identified for the reviewed literature.

First, it is a construction proof, based very much on the plane geometry that is specific to the quadratic case. There is no clear way how this proof should be adapted for other taxation cases (e.g.

piecewise linear tax schedules). Second, although it answers to the lack of predictability of the classical coalitional concepts invoked by Hindricks (2001) for the simplest quadratic taxation case, still the scope of the result in Theorem 2 is limited. That is because the quadratic case does not include the (more realistic) cases of neither concave nor convex tax functions. Finally, applying the ε - core and the least core doesn't bring much more dynamicity if compared to other mentioned concepts. Just to give an example, when a majority considers an objection to the status-quo, the possible reactions of the members of the minority triggered by this move are not taken into account by the concepts of ε - core and least core.

14.5 Conclusions and further research

The general conclusion is that the literature introducing adaptations (to the general setup of voting over (fixed) income tax schedules) of the standard concepts from simple majority voting games in coalitional form, does not essentially eliminate the drawbacks identified for the previous literature of the positive theory of income taxation. However, such studies can prove to be useful exercises in opening the venues for investigating more credible concepts, like Mas-Colell Bargaining Set.

As one could see, there are weaknesses of the core, ε – core and the least-core in coalitional games, related to the fact that when a majority considers an objection to the status-quo, the possible reactions of the members of the minority triggered by this move are not taken into account. Any adaptations of these concepts are inheriting the same credibility flaws.

The idea underlying the Mas-Colell Bargaining Set is that for an objection to be implemented there should be no *counter objection*. A *counter objection* to an objection can attract the votes of a new majority, while guaranteeing their initial utility to members of the old minority who were losing in the objection, if they wish to join the new majority. In this sense, an *objection* is said to be *justified* when there is no counterobjection to it. An element of the choice space belongs to the Bargaining Set whenever there is no justified objection to it.

However, transposing and using the concept of Mas-Colell Bargaining Set into the literature of voting over income repartitions is not in fact an easy task as we could learn from Grandmont (2006). The mot-a-mot adaptations of the Bargaining Set to Grandmont's voting setup provide just trivial results. Nevertheless, in his specific framework, Grandmont(2006) succeeds to define and explore two variants of the Mas-Colell Bargaining Set which help understanding the apparent stability of income redistributions in democratic societies. As related to the model presented in Section 14.3, we were not yet successful in implementing a working variant of the Mas-Colell Bargaining Set for the general model of fixed income taxation.

Therefore, one of the first priorities in this line of research is to investigate how can there be defined working variants of the Mas-Colell Bargaining Set for the model in Section 14.3 (and its associated simple majority game in coalitional form). And once this issue is resolved, the research questions that should have priority in the view of the existing literature are:

a) What are the implications of the Bargaining Set for the very realistic case of piecewise linear taxations?
b) Is it possible to obtain results when applying the Bargaining Set for the policy space *T(F, R)*, containing all tax functions with properties (14.3) to (14.6)?

c) Is is possible to construct and explore working variants of the Mas-Colell Bargaining Set for the model in Section 14.3 with a discrete income distribution *F*?

In the end, we want to put into discussion the feature of "stability" that we attributed to each of the solution concepts. As depicted in the beginning of the introduction, it seems that the stability of tax schedules is to be challenged by the recent thick plans of the governments to put new levies on the rich, and by the fact that the political debate becomes more and more dominated by taxation related issues. However, what we see nowadays should not necessarily be interpreted as political instability with respect to the taxation system to be agreed on.

One theoretical argument may be that, except the core which gives unique taxations (when it is not empty) for certain policy spaces, the least core cannot be proved to provide only a single tax system. And a working definition of Mas-Colell Bargaining Set, if to respect classical properties, would not have the cardinality of one since it should include the least core. Therefore, it is possible that the proposals (and the changes) we are seeing are just happening within the "frontiers" of the least core or the bargaining set (where we cannot formulate predictions). Another noteworthy argument for the end of the chapter may be that, the recent apparent preference of governments for more progressivity is just a normal switch from the taxations in the solution set for an R_1, to taxations in the solution set for an $R_2>R_1$ (condition imposed by the need to limit the public debt for the country).

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This book is important reading for anyone interesting by the implications of the financial globalization. The different contributions offer an in-depth analysis of the recent trends in globalization including debates related to the governance of the world economy and the implications of the crisis for the European integration. This book offers invaluable information for a wide range of audience; from academics to policy makers and anyone interested in learning about the multiple dimensions of the financial globalization.

Professor Jean-Pierre ALLEGRET, EconomiX, CNRS
and University Paris Ouest Nanterre La Défense, France

The book provides an interesting overview of recent problems associated with financial crisis and large scale of related implications. Contributing authors challenged particular problems with not easy task to highlight and observe a large complex of crisis related issues in many areas of the real and financial world in global economy. Different ideas and problems are discussed providing in-depth insight into financial crisis effects.

Professor Kosta JOSIFIDIS, University of Novi Sad, Serbia

Very interesting and stimulating book on some of the most followed and important research themes of recent financial aspects in global economy. The authors go deep inside into reasons and perspectives of the present economic and financial crisis: from globalization and financial contagion to growth design and monetary policy; from global imbalances debt constraints to risk management in financial markets. The book ends in a section devoted to eurozone perspectives, with a particular eye to the crisis of euro's governance, to the monetary union and the role of the monetary policy, to the banks financing growth, to the fiscal policy and the external constraints in the eurozone. Readers find here intriguing and original volumes to read, about unavoidable current financial aspects of global economy.

Professor David CARFÌ, University of Messina, Italy

The final crisis is the most important event to affect economics in decades. These two volumes cover this crisis and how economics and economists are responding to it. The chapters vary from the theoretical to the empirical, from those with a focus on policy to more general principles and from those which concentrate on a specific country or group of countries to more general analyses. They are a timely addition to the literature.

Professor John HUDSON, University of Bath, Great Britain

This new two-volume publication "Financial Aspects of Recent Trends in the Global Economy" covers a range of extremely timely issues, such as discussions of several aspects at the origin of the widespread financial and economic crisis (i.e., state imbalances, debt constrains, and oscillating exchange rates), as well as the recent development in financial markets practices and the Eurozone prospects. For its inherent content and specific design, the book is without doubt a suggested reading to all the ones who want to plunge into a deeper and more informed understanding of various relevant financial facets and perspectives of our globalizing world.

Professor Giovanni Battista DAGNINO, University of Catania, Italy