

# The Interaction between Profitability and Macroeconomic Factors for Future Examinations of European Banks Soundness – Theoretical Study

**Nahidah Naser**

Cracow University of Economics, Inter-Faculty PhD Studies in English, Poland

## Abstract

Any weakness in the financial institution is subject to the contagion mechanism. As result, the whole financial system will experience unpredictable financial risks and possible crisis, such as to a systemically relevant institution (e.g. Lehman Brothers' default, 2008's financial crises and Asian financial crises). The contagion mechanism (Quagliariello, M., 2009 [1] (Trapanese, M.) is a crucial element in the assessment of the cross-border dimension. The direct cross-border contagion risks (idiosyncratic risks) are: risks related to cross-border interbank links; money markets and cross-border ownership links; common shocks of foreign economies and global financial markets that can affect banks' exposures due to changes in credit quality, market valuations and funding costs. Secondly, the indirect cross-border contagion risks (Indirect contagion) are caused by systematic risks that exclusively related to cross-border credit exposures (e.g. lending to non-financial institutions, credit risk transfer exposures as well as international syndicated lending), market risk exposures (by holdings of securities and off-balance sheet positions), common cross-border funding (by financing through market instruments and operational risk).

From a theoretical point of view, said institutions are defined as risky banks, have unpredictable impacts on the smoothness of whole financial system. Moreover, these credit, market and liquidity risks represent the main triggers of crises. This paper is the second part of my theoretical study focused on the profitability and the soundness of European banks with an emphasis on the role of the Macro profile. In this paper, I also thoroughly investigated the macroeconomic determinants used to predict the Banking crises. Moreover, this paper analyzed the history and behavior of European banks during financial crises, and the corrective measures taken by authorities, governments and supervisory institutes to bail out the troubled banks, or to support the banking system as a whole. An extensive assessment of collected data resulted in detailed analysis of quantitative methodologies as well as the examination of the effectiveness of selected macroeconomic determinants to avoid the financial instability. This study shows that the macroeconomic adjustments were called upon during the crises.

**Keywords:** bank profitability; soundness of banks, inflation, GDP, interest rates, macroeconomic determinants, Moody's rating, exchange rates.

**JEL classification:** G21; G24; G01; E40

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## Introduction

A stable macroeconomic framework in finance and economic theory exhibits low and predictable inflation rates, appropriate real interest rates, and sustainable and stable fiscal policy. These features are demonstrated by predictable and competitive real exchange rates and viable balance payments. This description of a stable macroeconomic framework goes beyond the stability of macroeconomic factors to include other criterion where macro profile related factors are at levels conducive to growth. During financial crises, measures are taken by authorities, governments and supervisory institutes to bail out the troubled banks, or to support the banking system. These include financial stability packages; emergency liquidity assistances; recapitalization of the capital for the troubled banks; government capital injections; liability guaranties; exchanges rates fixes; international monetary fund programs; macroeconomic adjustment programs; strength supervision channels; government guaranties; interest free rates; foreign currency liquidity to maintain the exchange rates, external liquidity controls; establishment of minimum requirement or new currency regulation for foreign currency rates; structure or restructure reforms for external assistances; foreign exchange intervention and more.

Therefore, looking back at the behavior of banks during times of financial crises, and bail out methods as a means of evaluating the soundness of banks (European banks) and as a survival mechanism, could give new insight on how to handle new upcoming crises. The influence of macro profile was significantly and vigorously addressed during crises in most of financial reports and outlooks. This paper gives a comprehensive analysis of the journey of European banks past and present and evaluates the most common methodologies used to measure the soundness of European banks during both crises and stable periods. The impact of the macro profile on the soundness of banks is vital, but equally important are considerations on how the determinants of profitability carry the weight of bank soundness. For example, if GDP increases, a bank could earn higher returns by risk-taking policies, which will lead to more profitability. However, taking risk may raise real interest rates which will undermine the bank's stability. In theory, both income and expenditure are likely to be pro-cyclical since profit depends on a bank's expense policy and credit risk profile. Moreover, taking risk can also reflect losses of a bank and minimize profitability.

### **Objectives of The Study**

The general objective of the theoretical study is to evaluate the impact of Macro profile on the soundness of banks.

1. Determine whether it is plausible to only focus on the interaction between profitability and macroeconomic factors for future examinations of European banks soundness.

### **Macroeconomic Determinants of Profitability and Bank Soundness - Literature review**

Soundness of banks can be interpreted by the soundness of profitability, if the external determinants are chiefly predictable and the internal factors are controlled by minimum requirements, regulatory and supervisory, so that banks can absorb any crisis that lies on the horizon. In addition, macroeconomic factors such as GDP growth, high and unpredictable inflation, fluctuation of exchange rates, high real interest rates, and rapid credit expansion are associated with bank instability. Early literature (Short, 1979) suggested that macroeconomic factors are unique for each bank, and for each country. There are extensive empirical studies that have examined the impact of GDP on the bank profits (A Demirgüç-Kunt, A., & Huizinga, 1999; Athanasoglou, P., Delis, M., & Staikouras, C., 2006; F. Pasiouras, K. Kosmidou, 2007; Anbar, A., & Alper, D., 2011; Sufian, F., 2011; Claeys and Vennet, 2008; Kosmidou, K., Tanna, S., & Pasiouras, F., 2005; Combey, A., & Togbenou, A., 2017). The following scholars assessed the impact of inflation on bank profit, such as Athanasoglou, P., Delis, M., & Staikouras, C., 2006; Kosmidou, K., 2008; Athanasoglou et al., 2008; Trujillo-Ponce, 2013; Bourke, 1989; Molyneux and Thornton, 1992; Munteanu, I., 2012; Petria, N., Capraru, B., & Ihnatov, I., 2015; Combey, A., & Togbenou, A., 2017 and others.

The first and most repeated external determinant in all examined empirical studies was inflation which causes variations in bank profitability. Its effect depends on the assumption that wages and other non-interest costs will increase faster than the rate of inflation, which is not unusual and, accordingly, the annual growth in the consumer price index in each country was used as an independent variable. Since the maturity of economy forecasts the forthcoming inflation precisely and consequently, banks can manage their operating costs and increase the rates on loans faster than the operating costs to earn higher profits. The inflation and banking performance relationship has been introduced in the theory by Revell (1979) as he demonstrated that inflation affects bank's profitability through salaries and operating costs. Nevertheless, the relationship between the inflation rate and profitability was vague and depended on whether the inflation forecasting was predictable or not (Perry, 1992; Revell, 1979). Higher levels of economic growth will boost the lending operations in banks, and thus increase the margins, and improve the quality of their assets. (Bourke, 1989 and Molyneux and Thornton, 1992) concluded that the relationship between either inflation or long-term interest rate and profitability was positive.

With a fully anticipated inflation rate, bank management can adjust interest rates appropriately to increase revenues faster than costs, which should have a positive impact on profitability (Trujillo-Ponce, 2013; Athanasoglou, P., Delis, M., & Staikouras, C., 2006). A higher level of income had a positive impact on the demand for deposits and reduced the incentive for banks to set higher deposit interest rates. However, bank managements were unable to adequately forecast future inflation, even though, the monetary policy in the EU countries was usually predictable (Alexiou and Sofoklis, 2009). Thus, higher rates could have been charged on loans, less interest rates being paid on deposits and so on (Goddard, J., Molyneux, P., & Wilson, J. O. 2004).

The second most repeated determinate was GDP. The actual rate of annual GDP supports the argument of the association between economic growth and the financial sector performance. In rich countries with advanced banking sectors the effect was smaller. When the ownership of banks was addressed, the impacts of both GDP growth and inflation on bank performance were significant in all cases but with opposite signs for domestic and foreign banks, due to different levels of knowledge of country macroeconomic conditions and expectations concerning inflation rate between domestic and foreign banks (Pasiouras, F., & Kosmidou, K., 2007; Havrylchyk, O., & Jurzyk, E. M., 2006; Combey, A., & Togbenou, A., 2017). Additionally, domestic and foreign banks tend to serve different customer segments that may react differently under the same macroeconomic conditions. On the contrary, an increase in the money market rate, *ceteris paribus*, makes it more attractive to invest in risk-free securities that represent an alternative to detain deposits; the subsequent reduction in deposits demand determines an upward pressure on the interest rate on deposits (L Gambacorta, 2008).

Poor economic conditions negatively correlated with the quality of the loan portfolio and bank profitability, thus generating credit losses and increasing the provisions of banks. However, with any improvement in economic conditions, the condition of borrowers' solvency and lending effect positively on banks' profitability (Demirguc-Kunt and Huizinga, 1999; Bikker and Hu, 2002; Athanasoglou et al., 2008). Moreover, real GDP growth has a positive impact on banking performance through different channels: competition-stability, risk-taking, net interest income, improvement of loan losses, and operating costs (Berger, A. N., Klapper, L. F., & Turk-Ariss, R., 2009; Agoraki, M. E. K., Delis, M. D., & Pasiouras, F., 2011; Jiménez, G., Lopez, J. A., & Saurina, J., 2013; Bolt, W., De Haan, L., Hoerberichts, M., Van Oordt, M. R., & Swank, J., 2012; Calza A. & Sousa J, 2006). Also, higher GDP growth implies higher disposable income, lower unemployment and reduces defaults on consumer loans. Net interest income and loan losses were therefore pro-cyclical with GDP growth. However, the relationship between banks' operating costs and GDP growth was indefinite. Such unfavorable economic conditions (e.g. low GDP growth rates) may decrease deposits, loans and bank management costs while increasing the costs of collecting payments on loans (Bolt, W., De Haan, L., Hoerberichts, M., Van Oordt, M. R., & Swank, J., 2012).

The real GDP per capita seems to have no significant effect on bank profitability (even though the results strengthen if it's used) since the tight monetary policy of the examined period constrained bank lending. Thus, as soon as price stability was achieved, we should expect a stronger relationship between economic growth and bank profits, through increased lending, improvement in bank asset quality, enhancement of borrowers' access to the South East European markets and a decrease in supervisory toughness as well as uncertainty associated with macroeconomic instability (Athanasoglou, P., Delis, M., & Staikouras, C., 2006). Few studies suggested that bank profits were correlated with the business cycle as measured by GDP (Demirguc-Kunt and Huizinga, 2000; Bikker and Hu, 2000; Quagliariello, M. 2007). Demirguc-Kunt and Huizinga (1999) stated that in countries where banking assets constitute a larger portion of the GDP, banks had smaller margins and were less profitable. The business cycle's effect on profitability was positive, only when output was above its trend (Athanasoglou, SN Brissimis, MD Delis, 2008). Moreover, (Demirguc-Kunt & Huizinga, 2000, Albertazzi, U., & Gambacorta, L., 2009; Quagliariello, M., 2007; Sufian, F., & Chong, R. R., 2008, Bolt, W., De Haan, L., Hoerberichts, M., Van Oordt, M. R., & Swank, J., 2012; Bikker and Hu, 2002) tried to assess the effect of business cycle on banks' profitability. In theory, the combinations of several indicators of financial stability were better suited to indicate the state of bank system stability than individual variables.

Even though the concentration ratio was a banking industry factor, it is always added when addressing the profitability and macroeconomic profile. The concentration ratio measures the degree of banking competition in a national banking sector and it positively affects bank profitability, since larger banks tend to have higher margins. Williams (2003) suggested that concentration ratio may act as a barrier to entry into markets where domestic banks are highly concentrated, implying a negative impact on profits (Chen, S. H., & Liao, C. C., 2011). One study showed that national market concentration and merger policy were significant, however, parent nation financial development and parent bank profits are additionally relevant (Sturm, J. E., & Williams, B., 2008), some studies suggested that market share and concentration become explanatory impotence when included in the model (Athanasoglou, P., Delis, M., & Staikouras, C., 2006; Smirlock, 1985; Evanoff and Fortier, 1988). Moreover, it was significantly negative by Staikouras, C. K., & Wood, G. E. (2004).

Finally, it seems that concentration was less beneficial in terms of profitability to the Greek commercial banks than competition (K., Kosmidou, 2008). Money supply growth had no significant impact on profits in countries such as Portugal, Spain, France and Germany (Demirguc-Kunt and Huizinga, 1999; Abreu and Mendes, 2001). According to Maudos and de Guevara (2004), there was a positive relationship between market concentration and profitability, while (Petria, N., Capraru, B., & Ihnatov, I., 2015) suggested that market concentration diminished bank profitability. In highly concentrated markets, banks tend to collude and therefore earn monopoly profits, thus the lack of competition has a positive effect on bank profitability (Short, 1979; Gilbert, 1984; Molyneux, P., Lloyd-Williams, D. M., & Thornton, J., 1994).

The effective tax rate reflects the explicit taxes paid by the banks (mostly corporate income taxes). In general, the tax rates vary, and the variation offers an opportunity to see whether the differences in effective tax rates affect the profitability of the banks. Due to higher effective tax rates, banks tend to shift a large fraction of their tax burden onto their depositors, borrowers, and purchasers of fee-generating services. For example, Adler and Dumas (1980) pointed out that bank activities which were exposed to exchange rates had greater asset value volatility, while Chamberlain, S., Howe, J. S., & Popper, H. (1997) showed that exchange rates had the most direct effect on banks with foreign currency transactions and foreign operations, and even without such activities, exchange rates can affect banks indirectly through their influence on foreign competition, the demand for loans, and other aspects of banking conditions.

Lower exchange rates encourage competitiveness of firms due to the price decline of goods manufactured at home and the increasing demand for foreign products (Luehrman, 1991; Addae, A. A., Nyark-Baasi, M., & Tetteh, M., 2014; A Combey, A Togbenou, 2017). Thus, loans and deposits increase as well as banks' profits. Nevertheless, a lower exchange rate may also reduce domestic consumer purchasing power, as imported goods become more expensive. This situation may increase loans losses and have negative effects on bank's profitability. This would protect those banks from the full impact of the higher tax burden, but it would not eliminate the impact entirely. Thus, consistent with the results of Demirguc-Kunt and Huizinga (1999) a higher effective tax rate had a negative impact on bank profitability. Ukrainian banks profited from exchange rate depreciation despite of low profit. However, it showed variations in bank profitability among domestic banks and banks with foreign capital. Low exchange rate had a positive significant effect on income, and profit on foreign exchange transactions by anticipating exchange rate fluctuations (Davydenko, A. 2010).

According to previous studies, there was a positive relationship between interest rates and banks performance, bank profits increase with higher interest rates that reflected positively on profitability of banks. This was because interest rate directly affected bank interest income and expenses profitability (Ally, Z., 2014). The effect of interest rates and banking market structure on bank profitability was examined by Perry (1992) and Trujillo-Ponce (2013). The interest rate on loans depended completely on real GDP and inflation. Although, real GDP and inflation have a negative impact on the interest rate on deposits, and thus boosts loan demand and increases the interest rate on loans. Lending operations will be encouraged due to the higher rate of money market caused by the opportunity cost of other forms of financing. (Bourke, 1989 and Molyneux and Thornton, 1992) noted a positive relationship between inflation, profitability and the association between long-term interest rates and profitability. High real interest rates were connected to higher interest margins and profitability. For example, developed countries have higher real interest rates and higher interest margins, because demand deposits often pay zero or below-market interest rates. Nevertheless, even very small reductions in banks' lending rates or increases in their borrowing rates may, in aggregate, resulted in substantial redistribution of income to bank customers. Inflation involves higher costs - more transactions and generally more extensive branch networks and higher income from bank float.

Market growth was not suggested extensively in the literature. However, Short (1979) found that asset growth in individual banks was not significant. It was suggested that growth in total market may be considered as a potential variable in the sense that an expanding market, particularly if associated with entry barriers, should produce the capability of earning increased profits. Accordingly, annual growth in money supply in each country was suggested as an independent variable. The significantly negative impact of ratio stock market capitalization to total assets of the deposit money banks to bank's performance was also consistent with the results of Demirguc-Kunt and Huizinga (1999). In other words, the stock market development offered substitution possibilities to potential borrowers, which consequently decreased banks' profits.

The improvement in the regulatory framework, the observed significant credit expansion and the gradual adoption of sound macroeconomic policies, have all positively contributed to competition. While competition



could lower financial intermediation costs and contribute to an improvement in economic efficiency, it could reduce market power and the profitability of banks. Thus, it appears that reform, at this stage of financial system sophistication, caused banks to offer increasingly competitive margins on loans and deposits, which in turn lowers profitability (Athanasoglou, P., Delis, M., & Staikouras, C., 2006). Moreover, De Guevara, J. F., & Maudos, J., 2004) emphasized that regardless of deregulation and higher level of concentration, imperfect competition among banks was associated with welfare loss, however, the market power increased during the 1990s in most of EU countries.

The Efficient-Structure and Structure Conduct Performance hypotheses assessed the banks' performance and profitability (Sathye, S., & Sathye, M., 2004; Doyran, M. A., 2012) and evaluated a bank's profitability in all markets, the lack of potential rivalry empowers all market participations to gain more profits (Evanoff, Douglas D & D.L. Fortier, 1988). The Efficient Structure hypothesis suggested that by increasing managerial and scale efficiency led to higher concentration, thus higher profits. The Structure Conduct Performance model indicated the relationship between market power and bank profitability (Pasiouras and Kosmidou, 2007) since banking market concentration increased market power by gaining monopoly profits. In addition, the Structure Conduct-Performance hypothesis stated that the higher profits were due to superior management and increased market share (especially in the case of small-to-medium-sized banks). However, the empirical results of Papadopoulos, S. (2004) did not provide any support for the two efficient structure hypotheses. The cost advantages associated with greater bank size. For both hypotheses, deep analysis of the European banks will be needed to determine the impact on bank soundness and profitability.

Finally, similar results were seen when Berger and Humphrey (1997) highlighted that the importance of cost efficiency hypothesis compared to the market-power theory in explaining bank profitability when frontier efficiency analysis was applied. However, the Efficient-Structure theory explains the positive relationship between concentration and profitability as an indirect consequence of efficiency. The Efficient-Structure theory argues that the better managed banks or those with more efficient (and thus more profitable) cost structures could see their market shares increase, thus a higher degree of concentration. Moreover, their study addressed the government merger policy during crises due to the surmise that cost efficiency benefits from mergers policy. Huang, T. H., Chiang, D. L., & Lin, C. L. (2018) support that merger policy raises the market power and improve economies. However, there was no single pattern of mergers policies could dominate the different patterns of the methods of the mergers. Both the Structure-Conduct-Performance and Market-Power hypotheses were benefited and motivated by greater market power. The Industry concentration factor reflected two theories to explain how the degree of sector concentration affects bank profitability (Athanasoglou, M Delis, C Staikouras – 2006; Molyneux, P., & Forbes, W., 1995). Additionally, the real GDP growth rate had a positive impact on bank's performance according to the well-documented literature on the association between economic growth and financial sector performance (F Pasiouras, K Kosmidou, 2007).

Nahidah Naser (A Comprehensive Analysis of European Banking Soundness- Theoretical Study, 2019) stated that regardless of the methodology applied to examine the soundness of banks. The external factors increased the prediction of bank soundness, however, in some literature, the change was considered insignificant. It was also noticed that the Moody's structure for forecasting banks' failures and credit profiles accurately employed the macro profile qualitative approach. The macroprudential policies were set to prevent any future financial crisis, while the microprudential policies were set to prevent Banks's failure and idiosyncratic shocks. The hypothetical adverse macroeconomic and financial market scenarios examine the systemic risk by introducing new regulatory and prudential tools. However, Macro stress testing proved unsuccessful to capture the riskier banks inside financial system and underestimated banks' loan and credit losses. For further investigation, I would like to employ forecasting tree regression models and survival analysis to divide banks into different categories to predict distress banks through qualitative and quantitative approaches to forecast and estimate the soundness of banks while emphasizing the role of the most repeated predictable and unpredictable indicators.

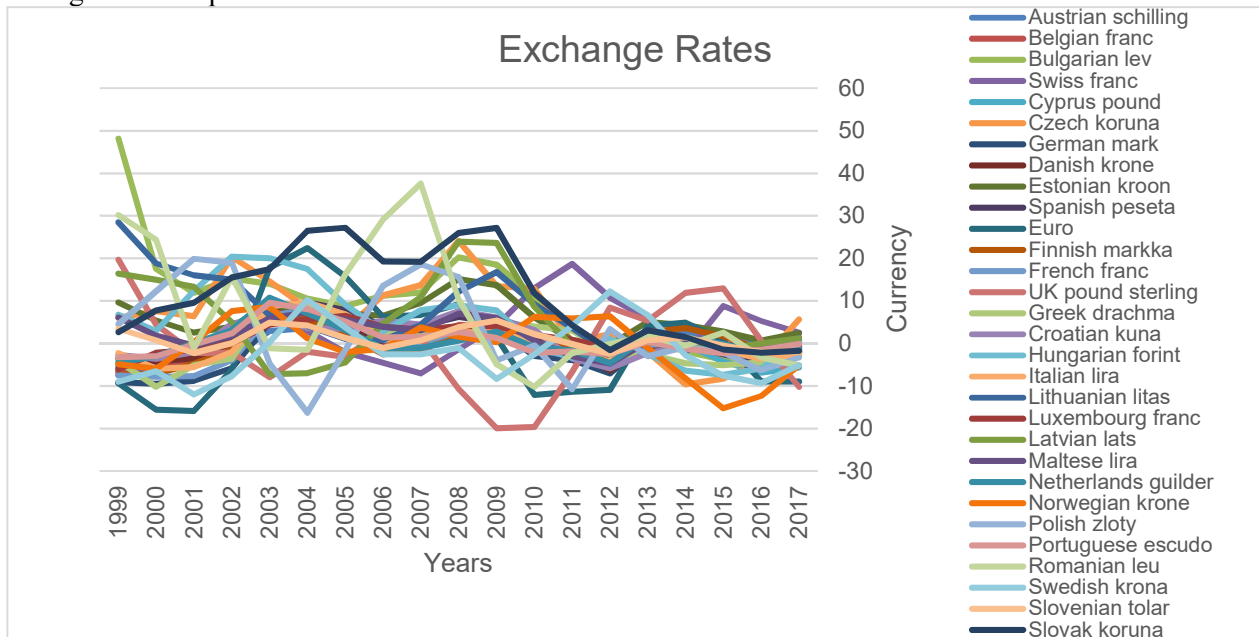
Table 1: The Most repeated Macroeconomic Determinants in literature (see Appendix A)

Determinants	Definitions		Frequency
Inflation	CPI annual inflation rate		29
Concentration (Bank specific factor)	Sum of the squared market shares of each bank assets		20
GDP growth	Real GDP, annual growth rate		20
Interest rate	One-year real reference interest rate on loans		9

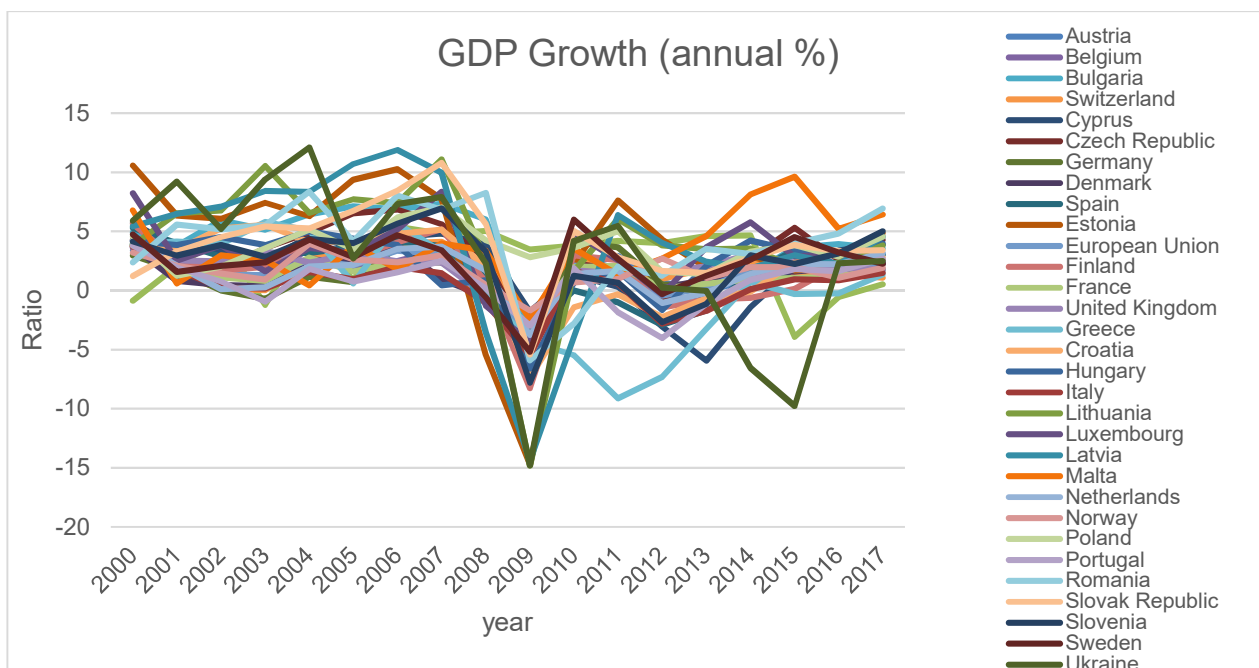
GDP per Capita	Ratio of GDP to population		4
Stock Market Ratio	The ratio of stock market capitalization to total assets of the deposit money banks		7
Exchange rate	The price of one currency in terms of another currency		2
Effective tax rate	Total taxes over pretax profit (%)		2
Market Growth	Annual Growth in the Market		2
Market Share	% of a market (defined in terms of assets)		1

Source: Own study.

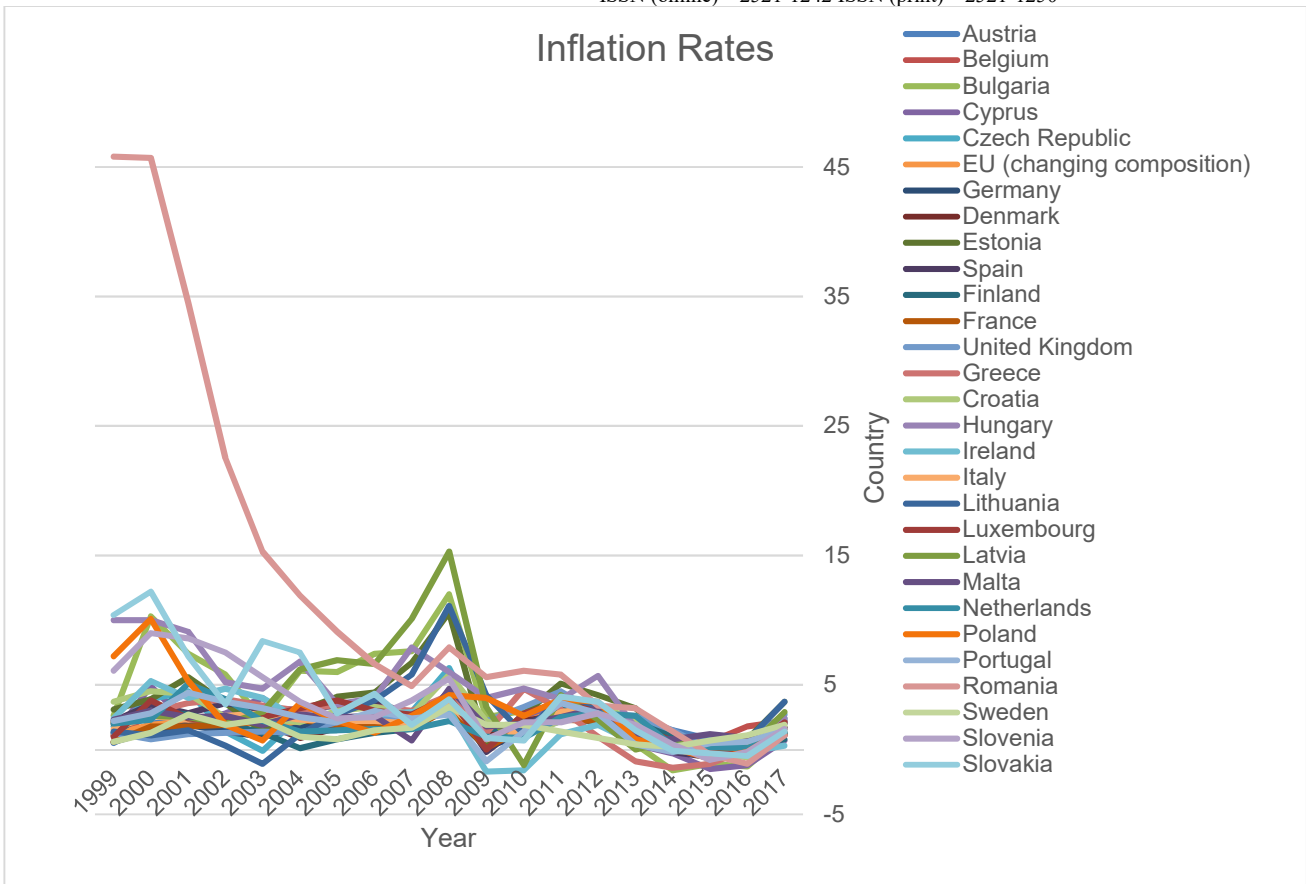
The next figures highlight the journey of Macroeconomic factors in European countries and their impacts during the crises period.



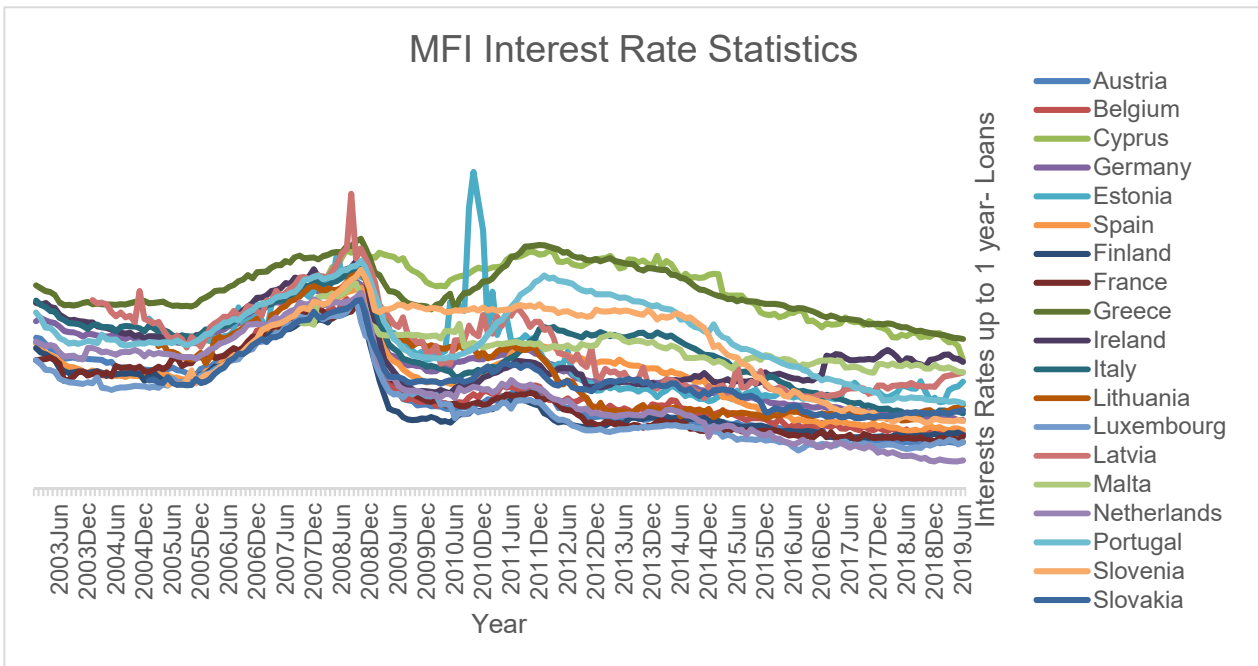
**Figure 1: Exchange Rates from 1999 - 2017: Data Resource. European Central Bank- Consolidated Banking data [2]. All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework)**



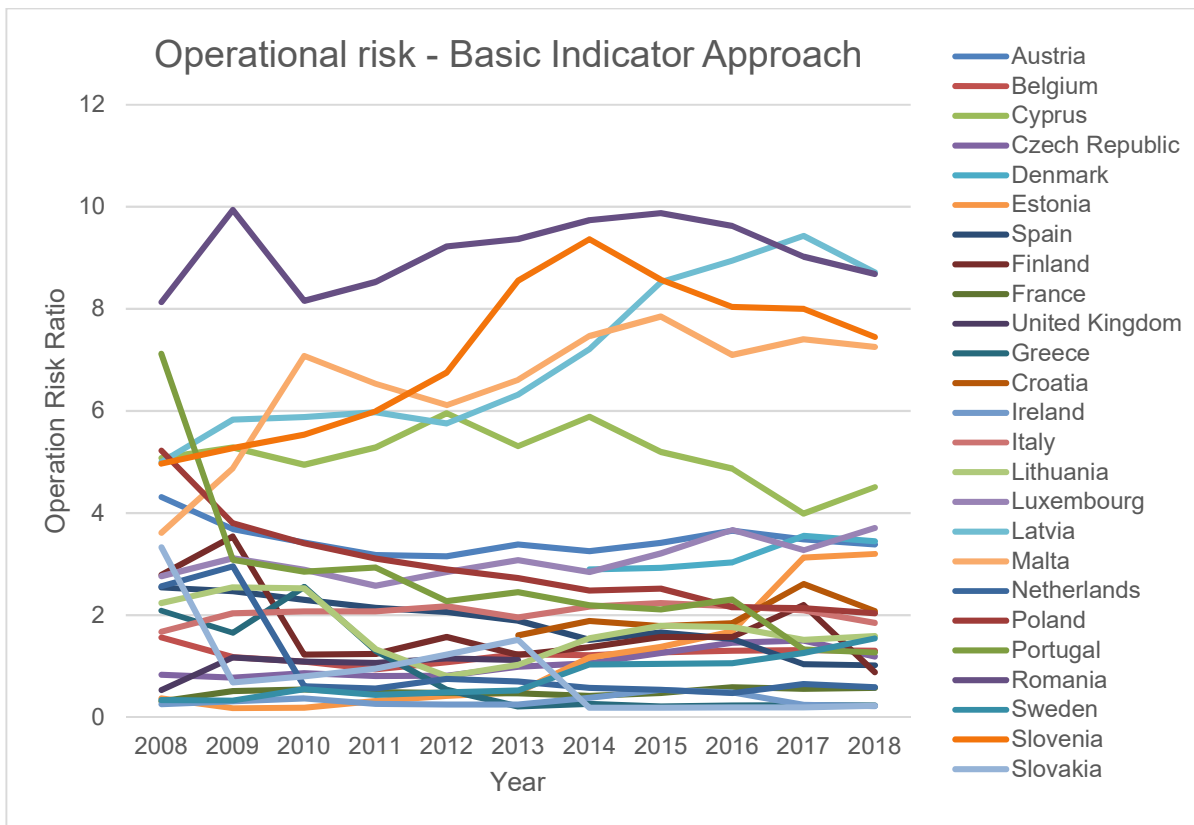
**Figure 2: GDP Growth from 2000-2017: Data Resource. European Central Bank- Consolidated Banking data Full sample (All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework).**



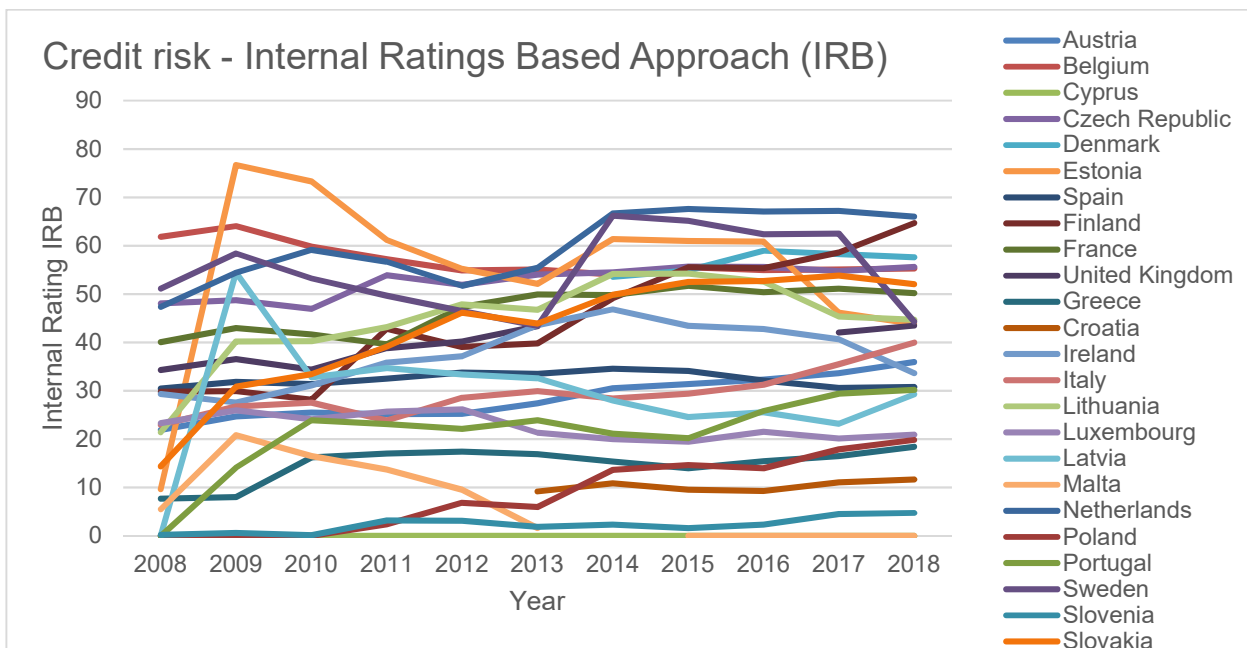
**Figure 3: Inflation Rates from 1999-2017: Data Resource. European Central Bank- Consolidated Banking data. Full sample (All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework)**



**Figure 4: MFI Interest Rate Statistics 2003-2019. Data Resource: European Central Bank, Financial markets and interest rates- Loans. Oesterreichische Nationalbank)**



**Figure 5: Operational risk - basic indicator approach 2008-2018. Data Resource: European Central Bank, Consolidated Banking data. All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework**



**Figure 6: Credit risk - internal ratings-based approach (IRB) from 2008-2018. Data Resource e: European Central Bank Consolidated Banking data. (All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework)**



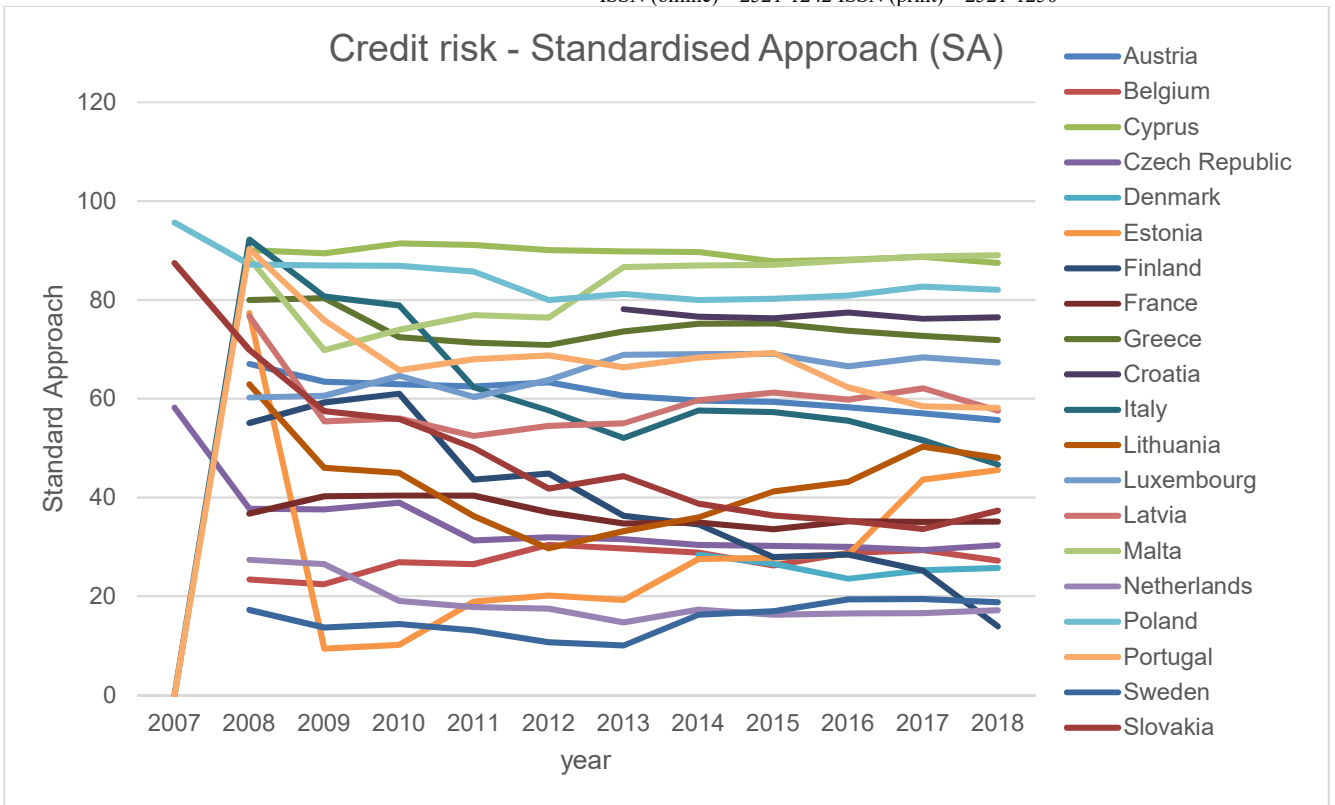


Figure 7: Credit risk – Standard Approach (IRB) from 2007-2018. Data Resource: European Central Bank Consolidated Banking data. All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework)

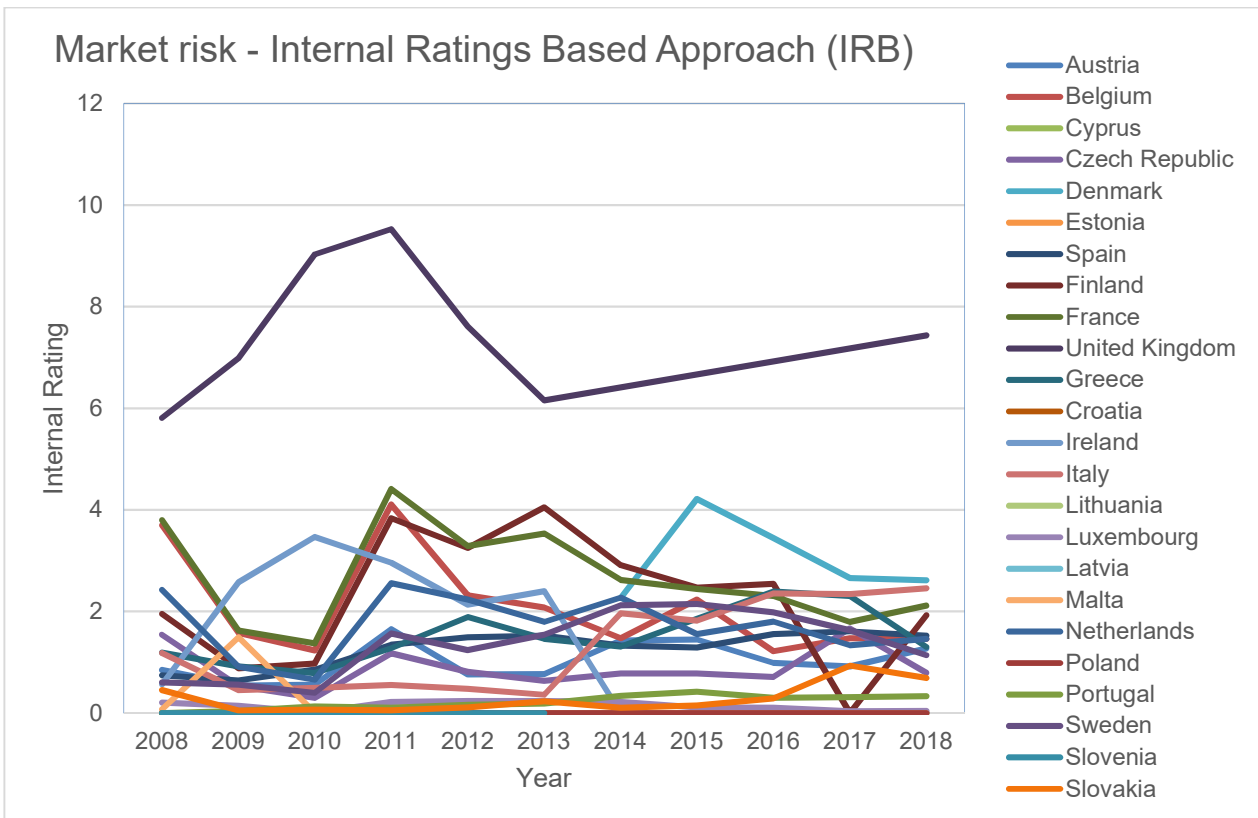


Figure 8: Market risk - Internal Ratings-Based Approach (IRB) from 2008-2018. Data Resource: European Central Bank Consolidated Banking data.

## In depth analysis on past and present European Banks soundness

The most important macroeconomics indicators of banking crises are related to deposits, capital, and foreign liabilities of bank. Typically, they represent the indirect indicators, of changes in the liquidity risk, credit risk and exchange rate risk, respectively. In other words, any fluctuations in these indicators indicate changes in the fragility of selected banks. This part is dedicated to analyses of the type of crises that European banks faced in the past and present, descriptions of the crises and measures / polices that were taken by governments and authorities (data collection was from European Central Bank [9]). The macro profile was heavily addressed during these crises.

Table 2: The History of European Banks based on. Resource: European Central Bank/Euro System<sup>1</sup>

Country	Type of crisis	Brief description of the crisis	Crisis management and policies
Austria	The crisis was due to high credit growth and leverage, afterward bank sector suffered misaligned incentives, low capitalization and profitability, mismatches and market illiquidity, exposure concentration. The liquidity problem was triggered by Lehman Brothers' default (2007-2016).	The US subprime market hit the Austrian banking sector directly but was limited, and caused by dry-up of the interbank markets due to defaulting Lehman Brothers, as a consequence the long-term structure of the banking sector was weaker, and credit spreads raised in CESEE (Central, Eastern and Southeastern Europe) in early 2009. the downturn, the NPLs grew in 2009. In spite of international investors' fears, the situation stabilized in a short time due to the Vienna Initiative.	Introducing a financial Market Stability Package to support Capital by the federal state of Austria in 2008, as well as funding guarantees and managing the public participations in the banking system using Interbank Market Support Act and the Financial Market Stability Act. Introducing "soft law" and the new recommendations to cut the lending in foreign currency. The new Minimum Standards issued by the FMA in 2013 were taken into consideration as well as the ESRB's recommendations and supervisory experience to manage the lending in foreign currency by subsidiaries of Austrian banks abroad (especially in CESEE). Cross-border collaboration by FMA and OeNB was launched in January 2009. Applied OeNB and the FMA supervisory guidance to strengthen the sustainability of the business models of large internationally Financial stability in Austria and host countries. Most domestic banks' business in the region followed the OeNB and the FMA Guide Principles in 2010. Requesting higher bank capital for the medium and long term, more balanced refinancing structure of exposed subsidiaries to absorb potential crisis situations. Three Austrian banking groups had applied the guidance; Erste Group Bank, Raiffeisen Zentralbank and UniCredit Bank Austria from 2012 to 2015. Later, only Erste Group Bank and Raiffeisen Bank International applied the guidance.
Belgium	Leverage and credit growth, excessive mismatches and market illiquidity, exposure concentration, misaligned incentives (2007-2012).	The Belgian financial sector was deeply affected by Lehman Brothers' default. A severe disruption in the wholesale financing markets, vulnerability of individual institutions and strong deleveraging to reduce the debt to increase the profitability and liquidity in most credit institutions and insurance companies.	Government interventions to restore the stability and confidence in the financial markets, such as re-capitalizations, asset/liability guarantees, emergency liquidity assistance and an increased amount of deposit guarantees. The state support played a huge role of solving the crisis.
Bulgaria	1995-1997	The crisis was triggered during the transition process in the 90s and caused deficiencies in the banking sector and the	In July 1997, introducing new measurements, such as tightening the fiscal discipline and currency board arrangement to overcome the crisis.

		regulatory framework, hindered by the structural reforms in the economy, losses in the state budget and banks, poor fiscal discipline, unbounded monetization of fiscal deficits, inefficient unrestricted monetary policy and loss of confidence in the domestic banks.	The principles of the currency board in Bulgaria were based on fixing the exchange rate of the national currency against the euro, full coverage of the central bank monetary liabilities, the central bank was obligated to sell and purchase levs against euro at a fixed exchange rate, central bank recommended no open market operations as well as no extended credits and guarantees to the government. The central bank provided credits only to the banks with liquidation risk that threatened the stability of the banking system.
Cyprus	Stock market bubble during the 1990s	The burst of the stock market bubble was due to joining the EU in 2000, and other positive political and economic developments. Both investors and consumers suffered major losses due to the crash in share prices; loss of confidence in market, some trading account debts were written off by banks and investment firms which spurred customers to buy shares.	Nothing to report.
	The Cypriot banking sector showed leverage, excessive credit growth, exposure concentration, mismatches and market illiquidity, misaligned incentives (2011-2016).	Cypriot economic growth and ambitions to become a leading international provider of banking services triggered the crisis by attracting significant inflows of foreign deposits in the banking system and imposing higher interest rates on deposits. Consequently, a dramatic expansion of banks' balance sheets, both domestically and abroad transferred as imbalances and vulnerabilities in the banking sector. The rapid expansion of domestic credit was due to significant inflows of foreign deposits and banks imprudent lending practices, inadequate risk management and corporate governance frameworks escalated the real estate boom. Fast acceleration of bank loans accompanied by growth of debt for both households and non-financial corporations and increased the vulnerability to absorb shocks. High lending rate exercises in banking sector deteriorated the financial position and their ability to meet their debt obligations. There was a rapid increase in non-performing loans, catastrophic losses during debt restructuring of Greek Government and the Private Sector Involvement. The solvency of the Cypriot	Due to the lower rating of Cyprus banks, the liquidity buffers were gradually worn away, and banks were unable to raise liquidity through the refinancing operations of the Eurosystem, thus the Central Bank of Cyprus provided Emergency Liquidity Assistance to cover banks' liquidity needs. Downsizing of the credit institution sector was needed given its large size and the accumulated imbalances by the carve-out of the Greek operations of Bank of Cyprus, Cyprus Popular Bank and Hellenic Bank pursuant to the provisions of The Resolution of Credit as well as other Institutions Law of 2013. Also, capital restrictions were imposed on banks, thus decreasing liquid assets in the Greek and Cyprus sovereign bonds. Then, customer deposits were downgraded and a decline in cash inflows from loan repayments followed, since the proportion of customers that did not meet the specified repayment schedule of their debt obligations increased. State-aid supported the Cyprus Popular Bank (CPB) by recapitalizing the bank as a loan. The remaining assets of the bank, including foreign subsidiaries and branches were liquidity injected to compensate uninsured depositors, other creditors, while shareholders of the bank remained in the legacy part of CPB. BoC was recapitalized by the bail-in of shareholders, bondholders. The European Financial Stability Facility / European Stability Mechanism and the

		banking sector and the quality of banks' loan portfolio deteriorate sharply in mid-2011 amid the unfavorable macroeconomic environment in Cyprus and Greece. More specifically, the three largest domestic banks suffered total losses due to the 'haircut' of the Greek Government Bonds (GGBs). The banking sector suffered accumulating current account deficits, significant losses in competitiveness, growing budget deficits and inflating public debt.	International Monetary Fund in mid-2012 to recover the economy and to ensure conditions of financial stability. A Cyprus macroeconomic adjustment program was reached at the end of March 2013. The key objectives were to restore the soundness of the Cypriot credit institutions sector, rebuild depositors' and market confidence by thoroughly restructuring, strengthening the supervision role and curtailing financial institutions, as stated in the terms of the Eurogroup agreement in 25 March 2013.
Czech	The Czech banking sector had leverage and rapid credit growth as early signs of crisis, along with misaligned incentives and infrastructure resilience. Debt-financed privatization of the enterprise sector and capital inflows in a regime of fixed exchange rate escalated the crisis, resulting in credit growth and severe external imbalances. Misaligned incentives caused by an institutional setting and a moral hazard escalated the credit growth and contributed to bank problems after the currency crisis ended. The bank crisis was also escalated by the privatization process of the enterprise sector in which numerous legacy assets were transferred from communist regime to corporations (1997-2000).	In the 1990s, the external imbalances were caused by overheating economics. Several measures were applied, such as increasing the interest rates and stabilization packages. During that time, strong capital inflows and fixed exchange rates occurred. In 1998, the need to stabilize the banking sector by providing guarantees for legacy assets accelerated the problem. Finally, one of the systemic banks had to merge with another systemic bank after defaulting.	The first stabilization package was introduced in April 1997, the second stabilization package in the mid of 1997 through different channels: fiscal tightening: wage freezes; import deposits; legal and institutional reforms. In May 1997, FX intervention (a conventional monetary policy tool) was employed by the central bank. Around mid-1997, the exchange rate regime was changed to manage floating of currency. Institutional consolidation from 1991 – 2007 provided guarantees for banks with bad assets.
Germany	The crisis was due to the failing of Herstatt bank 1973. Prior to 1974, there was increasing leverage in real estate construction and an inflationary environment that led to the misjudgment of the creditworthiness of borrowers and misallocation of capital in banks. The banking sector was vulnerable to a systemic banking crisis aka a "credit crunch" due to the implementation of counter-cyclical and/or real estate related macro-prudential instruments. In March 1973, the tightness of liquidity regulation (counter-cyclically), revoking an easing of those standards in 1969.	During 1970s, the floating exchanges rates reassured new trade opportunities, while inappropriate risk management in banks occurred. In June 1974, the closure of the insolvent Herstatt bank caused a disruption in the settlement of a large number of foreign exchange payments. Internationally, the loss of confidence in the banking sector due to bank's failure and fragility (Euro-currency market) after a boom period. Domestically, a number of smaller and mid-sized private banks suffered deposits outflows due to a fragile economic environment caused by oil-price shock, high inflation, and weak industrial investment and slowing residential construction.	The Bundesbank managed to restore the whole rediscount quotas and offered unlimited Lombard credit at standard rate. Refinancing private and regional banks improved, as well as the reconstruction Loan Corporation (KfW) bolstered the lending process to small firms. The Bundesbank participated in the establishment of a liquidity consortium bank to support banks that were facing temporary difficulties. The incomplete deposit insurance scheme was reformed. Regulations regarding banks' foreign exchange transactions and tighter capital ratios reduced the likelihood of any similar events in the future. International interbank assets and liabilities suffered a sharp decline. In December 1974, the BIS's Committee on Banking Regulations and Supervisory Practices.
	The early 2000s crisis was driven by: exposure concentration, without violation	Banks adjusted their balance sheets and corrected the lending standards in a pro-	The most distressed banks had to stabilize or merge within their respective banking groups. The

	<p>of standard large exposure regulations, accumulated credit and stock market valuations were written off; leverage and excessive credit growth appeared in balance sheets of non-financial borrowers and banks, where leverage increased the risk of pro-cyclical behavior in the downturn; misaligned incentives: conflicts of interests between financial advisors / brokers / stock market analysts / investment banking. Additionally, market manipulation that led to legal reforms structural vulnerabilities in the German banking sector (high cost and low market) (2001-2004).</p>	<p>cyclical way. From the three potential shock absorbers in the banking sector, two were strongly deteriorated: persistent low profitability across all banking groups and hidden reserves were worsened by falling asset prices as well as credit write-downs. The cyclical downturn after years of a domestic credit boom and the burst of the "new economy" stock market bubble negatively impact the German financial sector. Higher risk of a downward spiral due to the failure of financial system mechanisms between the end of 2002 and beginning of 2003.</p>	<p>banking supervisory authority took on Bankgesellschaft Berlin as a potential restructuring case, due to its real estate exposure losses. The so-called 'risk shield' by means of guarantees and injecting money was applied to strengthen confidence in the financial system along with Regulatory issues, such as transparency and addressing the conflicts of interest in the financial industry. The EU commission accepted these measures of state aid.</p>
	<p>During the 2007 international liquidity crisis, securitizations along with many underestimated factors escalated the crisis, such as exposure concentration and market liquidity risks as banks activities collapsed (in case of Germany: IKB and SachsenLB). However, the stressfulness of SIFIs due to exposure concentration, then the default of Lehman Brothers prompted government intervention. Some German banks experienced a high level of concentration to CRE and excessive leverage, as result higher risk of pro-cyclical and the crunching of credit supply. The effect extended to stressed EMU sovereigns and banking systems with lack of comprehensive stabilization policies (2007- 2017).</p>	<p>Some German banks had sizeable exposures to commercial real estate and the shipping industry. At the beginning of the crisis, exposures to stressed EMU sovereigns and banking systems were severely affected the financial sector in Germany due to the lack of comprehensive stabilization policies. Drying up of both market liquidity and funding liquidity led to the financial crisis. The weakness of the systemically important financial institutions (SIFIs) was also a key element after bankruptcy of Lehman Brothers. Accumulated systemic risks were moderated by domestic credit demand expanding. High leverage elevated the risk of pro-cyclical fire sales and a credit crunch.</p>	<p>The liquidity crunch in some institutions caused the crisis. In 2007, ECB made unlimited adjustments operations after Germany's KFW-bank had taken over the distressed IKB Deutsche Industriebank to provide outsized liquidity lines to special purpose vehicles. Applying measures, such as substantial government intervention to SIFIs, nationalization of Hypo Real Estate, recapitalizations, guarantees and 'risk shields'. Similar measures took place at the level of Bundeslaender for some Landesbanken. At the European level, the ESCB stabilized the situation by extraordinary monetary policy operations, complementarily the ESM was established.</p>
Denmark	<p>Leverage and rapid credit growth as early signs of crisis. Strong boom caused by low interest rates. A highly indebted economy, large current-account deficits and a structurally weak labor market which required strong fiscal improvements and incentives for private savings (1987-1995).</p>	<p>From 1987-1993, there was persistent low GDP growth, higher unemployment rates, a highly indebted economy, large current-account deficits and a structurally weak labor market after few years of strong economic upswing. Owing to the overheating of the economy in the mid-1980s, strong fiscal improvements and incentives for private savings were required. With the weak Danish krone, high wage increases were agreed to in 1987 followed by monetary tightening and market interventions in the currency market to defend the krone as well as higher the interest rates. Denmark's Nationalbank provided standby liquidity</p>	<p>The Danish government and Danmarks Nationalbank assisted only five distressed banks. They also assisted Denmark's Nationalbank through standby liquidity facilities for Denmark's second largest bank, Unibank. To defend the Krone, monetary tightening and market interventions in the currency market were required.</p>



		facilities for Denmark's second largest bank, Unibank and several distressed banks. Unfortunately, the crisis managed to also greatly impact the small and medium-sized banks.	
	Danish Banks suffered from a long period of strong lending growth, a large share of property-related exposures, leverage and rapid credit growth (2008-2013).	Prior to this crisis, high real growth in the banks' outstanding amounts of loans, high lending growth, higher write-downs on loans and deteriorated credit quality. Short-term funding through international money and capital markets was unstable and easily affected by deposits and long-term bond financing. The international liquidity crisis (2007) developed into a genuine global credit crisis later. The banks had large customer funding gaps for the period of strong lending growth. In 2009, unexpected large falls in real GDP and in exports coupled with the low Danish GDP and weak economy, drove the country into deep recession.	To close the gaps, short-term bonds provided by banks, and borrowed from foreign credit institutions. Government provided capital injections and gave the opportunity to purchase an individual government guarantee on debt issues to credit institutions, thereby providing a safety net for the banks through comprehensive government guarantee for depositors. Credit facilities and the expanded collateral base were provided by Denmark's Nationalbank.
Estonia	The loss of trade with the Soviet Union in 1990 caused a trade shock, the monetary policy tightened, and a currency board was instituted to end the post-transition inflation. A severe recession bottomed out in 1992-1993. Leverage and rapid credit growth as early signs of crisis, exposure concentration mismatches and market illiquidity, misaligned incentives.	The economic losses were in the double-digits, due to unqualified and inexperienced bank managers as well as poor banking sector regulation. The high share of non-performing assets caused liquidity problems in banks. The central bank enhanced banking regulation and strengthened banking supervision. The 1992 crisis caused moratoriums in three largest banks and foreign exchange deposits in the Soviet Vneshekonombank were frozen in two of them. Quick measures were undertaken by the central bank and government to support the stabilization of the banking system. Many small banks could not survive or be merged with other banks. There was a loss of confidence in the Estonian banks due to the delayed settlement of accounts. After independence, many banks and private entrepreneurship were reestablished.	Government and the Bank of Estonia provided liquidity assistance and injected capital to form new banks. A part of the non-performing assets of Balti Ühispank and Põhja-Eesti Aktsiapank were moved into a separate fund and the remaining assets were transferred to Põhja-Eesti Pank.
	Leverage and rapid credit growth as early signs of crisis, exposure concentration (1994-1995).	In 1994, Estonia had liquidity problems and a large amount of bad loans after the Estonian government and the largest municipality transferred their deposits to the government-owned bank. Eesti Tööstuse- ja	In November 1994, another bank, Eesti Tööstuse- ja Arengupank and Eesti Sotsiaalpank merged. However, there was no improvement and the liquidation of the bank was announced in May 1995.

		<p>Arengupank and Eesti Sotsiaalpank banks had difficulties even after merging and lost interested investors in the banking sector. Eesti Pank supplied liquidity assistance as well as injected capital to the bank, however, the liquidation of the bank was announced in May 1995.</p>	
	<p>Exposure concentration, misaligned incentives (June 1998- April 1999).</p>	<p>Higher exposure to the stock market due to large amounts of non-performing assets. In 1997, the Asian crisis crashed the stock market, which led to the deterioration of the bank's solvency until it went into default. Some Banks were hit by the stock market, and later affected by the Russian crisis in 1998 which caused a decline in investments and losses of deposits, partial default and devaluation. The Bank of Estonia injected capital in Optiva Bank (formerly Eesti Forekspank) and merged with Eesti Investeerimispank.</p>	<p>Partial compensation was made by the Government to Eesti Maapank due to the inefficiency of the deposit guarantee system. Capital was provided to Optiva Bank (formerly Eesti Forekspank) by Bank of Estonia, and then merged with Eesti Investeerimispank in October 1998.</p>
Spain	<p>The banking status quo was broken up and many of the existing institutions had insufficient funds. During 1970s, the Spanish economy was vulnerable due to the industrial crisis.</p>	<p>In the wake of the 1962 Credit and Banking Law, many of the existing institutions had insufficient funds and were vulnerable to the 1970s industrial crisis that severely hit the Spanish economy. The crisis was generated by general economic factors, such as the oil crisis and the hardest inflationary episode, with price dislocation, failed assessments and the inevitable corrective measures.</p>	<p>The Deposit Guarantee Fund was established by the Spanish Bank to overcome the crisis and to cover customer deposits of troubled institutions. Moreover, the crisis required a quick reconsideration of bank accounting standards, subsequently of prudential regulations and an intense fiscal stabilization effort.</p>
	<p>Leverage and rapid credit growth as early signs of crisis, exposure concentration. The global financial crisis, domestic housing bubble and excessive credit growth deeply hit the Spanish economy. The recession period, an over-exposure of savings banks to the real estate sector, other EA crisis and the weaknesses of the EA design have escalated the 2009-2013 banking crisis (2009-2013).</p>	<p>The Spanish crisis had several phases: economic crises due to the collapse of the real estate market; deep banking crisis or the combination of these two crises. Moreover, the distress in other EU members led to severe sovereign tensions in 2011. However, the fiscal position of Spain was relatively sound, but the economic recession and the banking crisis exhausted the loss-absorption capacity of government debt, as result sovereign tensions and capital flight. The crisis initially was triggered by housing bubble crisis, and then by the international financial market crisis.</p>	<p>Insufficient capital and loss-absorption capacity were covered by the recapitalization measures, burden sharing mechanisms and public funds contributions in eight banking groups. The introduction of new legislation on savings banks and the establishment of bank foundations by the corporate regime to govern the savings banks were warranted. With public support, some banks resized through an intense process of rationalizing their balance sheets. To tackle the crisis, unconventional monetary policies, creation of the SSM, and EU political measures were employed.</p>
Finland	<p>Leverage and rapid credit growth as early signs of crisis after deregulation of the financial markets from 1991-1998. Excessive risk-taking</p>	<p>Exposure concentration in domestic corporate loans. Loss of confidence in SKOP bank. Lower interest rates and rapid credit growth escalated a real</p>	<p>In September 1991, the Bank of Finland stepped in to save confidence in SKOP Bank, and to take over control of the bank to maintain the stability of financial system. There were a lot of</p>

	<p>spurred by misaligned incentives.</p>	<p>estate bubble and overheated the economy in 1988, during which monetary policy was constrained due the exchange rate regime. The currency depreciated sharply by the end of 1991 and later, there were defaults in business deals with foreign currency obligations. The economy suffered from a worldwide recession, a major tax reform that limited the deductibility of interest payments, coupled with high debt burden, burst the bubble and caused a recession. Monetary tightening started in 1989.</p> <p>exports declined by over 6% as well the domestic demand by about 8%. The unemployment rate exceeded 10% in 1991. Collapsing the domestic economic activity with a severe decline in profitability that worsened the banks' financial position. Moreover, with the collapse of Soviet Union, Finland's exports were greatly decreased. Many financial institutes chose bankruptcy. In 1992, Finnish banking had a severe systematic crisis without suffering any failure. For example, SKOP Bank was taken over by the Bank of Finland. Then, the Finnish banks started major restructuring of the banking sector, and the crisis ended in 1995. Later, the Bank of Finland allowed the markka's exchange rate to float temporarily.</p>	<p>mergers in local banking groups, both in savings banks and in co-operative banks to handle the crisis. Some banks had their banking licenses revoked, and then they were converted into asset management companies. In 1995, prior to crisis, there was no proper legislation was in place to manage the situation, especially after the merger of Kansallis-Osake-Pankki and Union Bank of Finland to form one of the Finland's largest commercial banks.</p>
<p>France</p>	<p>During the 1990s</p>	<p>This crisis had complex stages. France had a high GDP growth and deregulation from 1987 to 1990 that caused a huge increase in both residential and commercial real estate prices. A sharp decrease in commercial real estate properties had a negative impact on the financial position of borrowers and caused their default, despite a bounce back effect in early 1991. The ERM crisis affected the European partners and France in September 1992; the recession in real estate; the fragile state of the banking sector and the near bankruptcy of the Crédit Lyonnais due to real estate market downturn and a risky business model strategy. Second, due to the non-performing loans and the fall in</p>	<p>None.</p>

		<p>value of real estate property assets in portfolios; they substantially reduced the supply of loans to investors. The sharp increase in oil prices during Persian Gulf War crisis caused a severe macroeconomic slowdown and a significant decrease in real estate prices. The recession hit its lowest level at the beginning of 1993. A budget motivated by the upturn of the economy in 1993 and lasted for one year.</p>	
	<p>Leverage and rapid credit growth as early signs of crisis, mismatches and market illiquidity, infrastructure resilience (2008-2009).</p>	<p>The cross-border crisis hit the financial sector and hampered exports that ended an era of growing GDP, booming real estate prices and falling unemployment, especially after default by Lehman Brothers and a freezing of the interbank market. The external shocks and financial crisis caused a fall in investment and consumption, as well as deterioration of the economic environment. High unemployment led to depressed consumption, declining the investment and lower demand. As a result, the unemployment rate rose from 7.5% to 9.5%. By end of 2009, there was a sharp decrease in positive GDP growth and unemployment.</p>	<p>Several measures, such as: EU state aid case NN50/2008 to restructure and inject capital into Dexia; EU state aid case N548/2008 provided a French bank guarantee scheme November 2008-November 2009; EU state aid case N613/2008 and N251/2009 provided a French banks recapitalization scheme in December 2008 and in March 2009, then finally, EU state aid case N249/2009 to merge and inject capital into Banque Populaire/ Caisse d'Epargne.</p>
Greece	2010-on going	<p>In 2009, the government deficit extended to a double-digit percentage of GDP, while the public debt was 115.1% of GDP. In April 2010, Greece's credit ratings were downgraded. The yield spread between Greek and German government bonds triggered by the negative developments, thus increased borrowing and the debt servicing costs for the Greek government.</p>	<p>The most significant measures were (European Central Bank: EU/ECB/IMF) Financial Support Program (2010); Establishment of Hellenic Financial Stability Fund to fully recapitalize banks (2010); Adoption of the new resolution Framework (2011); Implementation of the EU Summit Decision on PSI (2011); Recapitalization exercise covering all risks conducted by BoG (2012); Implementation of PSI+ (2012); increase of the HFSF capital (2012); Establishment of the Resolution Unit within the Bank of Greece (2012). A number of cooperative banks (2012) and resolving ATEbank (2012); The second Financial Support Program (2012); Recapitalization and Restructuring of the Greek banking sector by Piraeus Bank (2013); completion of banking sector restructuring and the resolution of commercial banks that failed to meet capital needs (2013); Cooperative banks restructuring through capital raised by some cooperative banks and the resolution of three weak institutions (2013); Stress testing of Greek banks (2014); Key actions to address NPL management (2014).</p>

Croatia	<p>During the 1990s' transition, Croatia faced many challenges, such as heavy state involvement in real sector; weak corporate governance; harmful privatization process and weak institutional framework. Ineffective banking supervision system to enforce prudent governance in banks. Moreover, weak bank regulations allowed a number of private agents with insufficient capacities to engage in banking activities. The Private Banks provided cheap financings to founding companies (exposure concentration, misaligned incentives).</p>	<p>The financial difficulties spread across the banking system, particularly in the fifth largest bank, then affected other inadequately governed institutions. Banking crisis did not affect the real estate sector. In 1996, the government finalized the resolution process by writing-offs of NPLs, recapitalizing three large banks, and then sold them to foreign financial institutions by the end of 1999 and early 2000. Additionally, banks increased their market share by credit expansion as well as very aggressive interest rate policies (excessive credit growth). Many systematic risks accumulated in the banking sectors. Due to extensive credit losses, a few banks defaulted during transition period.</p>	<p>In 1998, government assistance to the fifth largest bank. However, three were major losses in several other medium-sized and small banks that led to a surge in deposit outflows and a loss confidence. In 1996, failure of the recapitalization process from public resources led to bankruptcy procedures as well as privatizing three large banks. Low interest rates encouraged lending using the emergency liquidity facility as a part of the measurements of the monetary authorities and the central bank.</p>
	<p>The global financial crisis caused a slowdown in capital inflows, an abrupt contraction of the domestic demand as well as insufficient external demand which hindered the recovery. The Croatian economy faced a major structural growth crisis. The failure of a few small private banks caused the inability to survive in a long-lasting recessionary environment, heavy exposure to the SME among others. During the transition period, several banks lost capital, so state funds were injected (2007-2012).</p>	<p>The collapse of Lehman Brothers caused a global risk and high price volatility as well as a fall in liquidity and unpredictable markets. The financial system and exchange rate were stable, but the government repaid the maturing debts according to the countercyclical monetary and macroprudential policy of the central bank. The risk premiums in Croatia increased, and stress spread to the domestic financial system through foreign financial markets. International debt market conditions worsened with higher CDS premiums for the parent banks of the five largest domestic banks. Adverse developments in CDS premiums increased the risk perception of Italian parent banks compared to other countries, such as Austria or France. A partial withdrawal of the parent banks' funding increased pressures on the foreign currency liquidity and a higher level of stress due to the international securities. Parent institutions of domestic banks financed excessive credit growth that led to high level of current account deficit and increased foreign debt while the competitiveness indicators declined. Weak financial markets with limited supply pressured the domestic currency exchange rate and financial assets' prices. A strong credit activity, declining</p>	<p>During the global financial crisis, the CNB gradually released the previously established banking system's liquidity reserves to facilitate the domestic sectors due to the collapse of Lehman Brothers after a panic episode by domestic depositors. The CNB supported the foreign currency liquidity. In 2004, the marginal reserve requirements (MRR) were applied to slow down the growth of banks' external debt by allocating a significant share of their net foreign borrowing into a special account held with the central bank (above 50%) as interest-free foreign currency deposits. In late 2008, CNB reduced the general reserve requirement rate to 14% to improve the domestic financing conditions for the corporate sector. However, the government needed substantial financing aid. Weak currency occurred due to limited net inflow of foreign capital which reduced the minimum required foreign currency claims rate to 20.0% at the beginning of 2009, releasing even more foreign exchange liquidity. Adjustments of substantial foreign currency liquidity provided exchange rate stability and overall financial stability of the economy. The Croatian banking sector was under control and very well capitalized during the crisis. No fiscal interventions were required for banks' resolution. Lending declined and the economy recovered in early February 2010. The CNB lowered the minimum required foreign currency claims rate to 17% to improve banks' credit potential, decrease banks' regulatory costs, while lending rates improved financing conditions for the corporate and household sectors. The European debt markets hit the Croatian</p>



		<p>the quality of granted loans and intensified risk-taking by the banks. The CNB applied several innovative instruments to address the intensive foreign borrowing of banks, which led to the maintenance of considerable capital and reserved liquidity. The central bank imposed macro-prudential measures, and slowed down banks' foreign borrowing practices, while encouraging the parent companies to inject capital instead. Furthermore, the CNB (Croatian National Bank) restricted growth to 12% annually. The banks that increased over 12% were forced to purchase low yielding CNB bills worth 50% of the number of excessive placements. The well capitalized Croatian banking system was a result of the active macro-prudential policymaking. However, at the peak of the global financial crisis, the central bank had built considerable buffers to pursue countercyclical policy.</p> <p>However, the CNB could not stop some domestic sectors from borrowing in foreign currency that led to the deterioration of the net international investment position despite of the central bank' efforts. Financing domestic demands by foreign savings prior to crisis caused major long-term damage to the Croatian economy.</p>	<p>economy deeply by the mid-2011, the increase in the cost of foreign borrowing plus the withdrawal of parent banks' funding had led to depreciation pressures on the kuna exchange rate.</p> <p>The central bank participated in four foreign exchange interventions to maintain the relatively stable exchange rate. In October 2013, the CNB switched to a rules-based approach which required banks to value assets more objectively, to spot credit losses in time so that banks engaging in debt restructurings (evergreening of loans). Due to low liquidity of the real estate market, there was a strong increase in provisioning costs that negatively reflected on banks' earnings, which successfully encouraged banks to speed up the process of NPL resolution.</p>
Hungary	<p>There was a severe recession despite of enacting bankruptcy legislation in 1992, enterprise restructuring was doomed by inadequate reforms to bank lending policies. The current account deficit was almost 10% of GDP during 1993-94, and the external debt rose to higher level. The fiscal deficit grew to 8% of GDP in 1994 and a crawling currency was introduced in 1995. Stabilization and growth were hampered and there was heavy foreign borrowing by enterprises during 1994-95, and strong capital inflows in the second half of 1995.</p>	<p>During the transition period, excessive loans caused insolvent enterprises. Banks had insufficient capital, were improperly regulated and were unrestricted controlled by unqualified owners. The high inflation was reduced after the transition period. The accumulation of Hungarian FX loans remained along with high household indebtedness and vulnerability of the Hungarian government. The excessive credit growth was caused by high reliance on short-term debt and derivative instruments. HUF sharply depreciated against CHF while the material credit and refinancing risks grew.</p>	<p>Crisis was solved by Injection of state funds.</p>
	2007 international liquidity crisis	<p>The crisis was imported due to the interconnectedness of</p>	<p>In order to restore investors' confidence, there was an ease in</p>

		<p>financial intermediaries and high external weakness of the domestic financial system in Europe. The frozen international money market hit the Hungarian economy hard. During the crisis, financing the public and banking sector was hindered by the foreign exchange and the renewal of swaps risks. Additionally, the public sector's budget deficit increased, in addition to higher levels of local currency interest rates. Low funding costs caused an increase in the foreign currency-denominated loans. Furthermore, there was a decline in the international money markets and a build-up of vulnerability in the Hungarian banking sector where most of the loans were in foreign currency (mainly Swiss francs). As a result, the banking sector experienced an increased rate of non-performing loans, followed by deteriorated profitability during the downturn.</p>	<p>financing and liquidity tensions. Governmental loans were provided for commercial banks. Unconventional monetary policy measures addressed the weak bank lending activity.</p>
Ireland	<p>The crisis emerged in the domestic banking sector. The main Irish banks generated revenue by using cheap sources of short-term wholesale funding during real estate market crisis. The leverage of domestic private sector increased pre-crisis as well as indebtedness. The excessive credit growth, excessive maturity mismatch, Concentration risk unified with dangers of misaligned incentives during the Irish crisis of 2008-2013.</p>	<p>The Irish banks had significant liquidity problems due to global debt markets, domestic macroeconomic imbalances and unsustainable banking sector strategies. In terms of macroeconomic imbalances, a pro-cyclical fiscal policy position and policies that coincided with favorable domestic demand factors, the banking sector was largely funded construction/property boom by relying on cheap sources of external wholesale borrowing.</p>	<p>The scale of the banking crisis required intervention, and was significant due to frozen international funding markets. Guarantees on certain types of liabilities, expansion of the Deposit Guarantee Scheme, recapitalizations of domestic banks, nationalizations of some domestic banks, establishment of an asset management agency (i.e., NAMA). Targeted deleveraging, fiscal consolidation measures and structural reforms (ECB/IMF/EU Program) for external assistance were all required. The emergency liquidity assistance was extended and nationalization the Anglo-Irish Bank.</p>
Italy	<p>Leverage and rapid credit growth as early signs of crisis, exposure concentration. During the 1990s, several public-owned banks were affected by allocative and cost inefficiencies, and then severely hit by the strong recession. Italian banks had to increase their exposures toward riskier borrowers from 1991-1997.</p>	<p>Unstable currency markets and connected with the ERM crisis (the Lira exited the ERM) hit the Italian economy hard, a large number of small banks in the south were in distress in the '90s.</p>	<p>The crisis was managed through usual instruments and in line with private market solutions. Poor management caused weakness in two large Italian banks (Sicilcassa and Banco di Napoli), and then bank sector fell into the political sphere. Two banks were becoming privatized after applying for reconstruction reforms. Various forms of public interventions were applied and had an impact of 0.5% in terms of 1996 GDP.</p>
	<p>Tensions in the sovereign bonds markets in the euro area from 2011-2013.</p>	<p>The instability was caused by tensions in the sovereign bonds markets in the euro zone. As a result, the Italian economy developed three main transmission channels:                  Banking channel: Banks could not generate funds due to the deterioration of sovereign</p>	<p>Several monetary policy measures were taken by the Eurosystem to assist the euro-area banks obtain liquidity. Several interventions at the European institutional level to improve risk were aimed to strengthen financial system stability and to restore market confidence. Banks' funding difficulties were largely eased by the ECB's</p>

		<p>creditworthiness in terms of higher cost of credit and unavailability of loans through the traditional bank lending channel. Increasing the Banks' cost of funding significantly as well as the cost of new loans to non-financial corporations and households in 2011.</p> <p>Confidence channel: The EU's sovereign debt crisis had an impact on businesses and on consumer confidence. The crisis was magnified by many factors: fiscal consolidation policies (i.e. cuts on government spending and/or tax increases) to recover public finances; the negative developments in the equity and the bond markets were the reason for the internal and external financing of investment expensive and affected consumption and the deterioration of the economic outlook.</p> <p>Trade and financial linkages channel: The impact of sovereign debt markets had a continental effect through international trade and financial linkages. During the sovereign debt crisis Italian intra-EMU, exports decreased markedly.</p>	<p>decisions to reduce the official rates at the end of 2011, also by launching the two 3-year longer-term refinancing operations. In mid-2012, due to emerging economies, a large inflow of capital and structural reforms made the economy more resilient to forthcoming shocks. In 2013, the financial conditions improved due to the crucial contribution of monetary policy.</p>
Lithuania	<p>Lack of proper legislation, weak bank regulation, low bank capitalization levels and excessive risk taking. The weak internal environment, difficulties to measure the riskiness of bank borrowers and poor bank loan portfolios led to excessive credit growth to risky borrowers. Borrowers started defaulting on their loans, and then banks were unable to maintain sufficient liquidity. Expansionary monetary policy and supply shortages led to hyperinflation from 1992 to 1993. There also was a credit crunch and recession from 1991 to 1993.</p>	<p>During deflation, many borrowers were unable to repay loans and the number of bad loans rose. Moreover, bank profit margins fell dramatically. From 1994-1996, the banks' insolvency problems led to a loss of confidence in the banking sector and a freeze on interbank market lending. The crisis was caused by insufficient banking regulation and supervision at the micro level as well as an undeveloped banking sector.</p>	<p>The Lithuanian parliament adopted crisis management policies, such as:</p> <ol style="list-style-type: none"> <li>1. Increasing banks' liabilities to shareholders and board members.</li> <li>2. Number of legislations required in case of banks' insolvency via government interventions channels.</li> <li>3. Liquidity loans and purchased government securities from troubled banks by Bank of Lithuania. An ease on this requirement for commercial banks was temporarily lifted.</li> </ol>
	<p>Lithuania's banking sector had extensive and unbalanced credit growth. Looseness of bank credit standards affected the quality of the banks' balance sheets. Furthermore, extensive credit growth and high housing prices led to increase the private debt and (subsequently) to credit defaults (2004–2008).</p>	<p>The crisis was caused by both external and internal factors. Investment started slowing down due to the lack of confidence related to the weak macroeconomic environment when GDP growth became negative. Reduced economic activity, increased private debt, high housing prices and high nominal interest rates led to an increase in non-performing</p>	<p>Government intervention increased the deposit insurance limit. The Bank of Lithuania lowered the mandatory reserve requirement to 4%.</p>

		loans and a sharp tightening of bank credit standards. Lithuania suffered from low house prices and an economic slowdown. In late 2009, the Lithuanian parliament increased the deposit insurance limit to end the crisis.	
Luxembourg	Exposure concentration, excessive credit growth and moral hazard. The crisis was caused by sovereign debt of The Dexia, Lehman Brothers, the Icelandic banks and the Greek sovereign debt crisis. (2008-2010).	The troubled Luxembourg financial system and the bankruptcy of Dexia. The origin of the Dexia's crisis was complex and partially related to the collapse of Lehman Brothers and the sovereign debt crisis. The Luxembourg economy is relatively small and highly connected to the euro area.	The governments of Belgium, Netherlands and Luxembourg got involved to save Fortis. Capital was injected after the Luxembourg government acquired approximately 50% of the Fortis' equity. In October 2008, Fortis emerged in Belgium and Luxembourg, but was renamed as BGL in Luxembourg. The stress ended October 2010 when the bank was ultimately incorporated into BGL BNP Paribas. Finally, Dexia was restructured by the Belgian government in 2011.
Latvia	There was a sharp decline in the Latvian economy and in bank profit margins on trade financing when inflation was reduced from almost 100% in 1992 to 26% in 1994. A term of trade shock and the collapse of the eastern markets occurred early in the transition. The crisis was triggered during transitional phase of the Latvian economy by insufficient financial sector regulatory framework, poor corporate governance and fraudulent activities of the banks.	In 1995, the banking crisis was due to the transitional phase of the Latvian economy which was exacerbated by the immature and weak regulatory framework of the financial system. Many banks had poor corporate governance and risk management practices, so they were unable to absorb losses after relying on speculative and opportunistic bets on macro-financial developments. Moreover, the key causes of banks' insolvencies were due to fraudulent activities.	Further strengthening and developments to the financial sector regulatory framework.
	Leverage and rapid credit growth as early signs of crisis; high dependence on the market funding of one of the largest banks in the country; exposure concentration; moral hazard and misaligned incentives ("too big to fail"); and an unfavorable external environment from 2008-2010.	Prior to the financial crisis, economic growth was driven by foreign capital inflows which led to excessive credit and real estate sector developments. As tensions in the international capital markets increased, the financial soundness of the second largest bank came into question until it was nationalized at the end of 2008. As foreign capital inflows were hindered, the Latvian economy had to undergo a large cyclical and structural adjustment. The non-performing loans rose sharply as the economy began a massive pay off process.	The Latvian Government took over the second largest bank in terms of assets - Parex Banka. The Government support to Parex Banka consisted of both capital and liquidity injections, as well as state guarantees to roll-over Parex Banka's funding in a form of syndicated loans.
Netherlands	Despite the fact that the Dutch banks were too big to fail, mismatches and market illiquidity motivated by all vulnerabilities played an important role (except in infrastructure resilience). The first trouble that the Dutch financial institutions faced was funding problems (excessive	Severe funding problems were experienced. High leverage and higher levels of dependency on market funding exposed the Dutch banks to the shocks that hit the global funding markets. The combination of the global financial crisis and credit exposure impacted the Dutch	Nationalization of Fortis ABN AMRO, provided capital to banks and insurance companies, a funding guarantee scheme, an increase of the insured amount under DGS, ultra-easy monetary policy as well as fiscal stimulus in 2009 and again in 2010.

	leverage and maturity mismatch) which were worsened by exposure to concentrations.	financial sector as well as the deep recession in 2009.	
Norway	During the 1970s and the 1980s, the Norwegian economy had a period of excessive credit growth and leverage due to the softness of bank capital requirements.	Excessive loan growth occurred after the lifting of the quantitative regulation of bank lending in 1984 which led to a sharp decline in both residential and non-residential real estate prices. Additionally, the monetary policy was pro-cyclical with the Norwegian krone, higher German interest rate, lower inflation, changes in the tax rules, thus higher after-tax real rate of interest above the 7% in 1992. Many small banks failed caused by higher losses on their loan books from 1988 to 1990. A year later two of the three largest banks collapsed and largest bank had severe loan losses in 1992.	A write down of equity and instruments of ownership was cancelled according to bank losses. Deposit guarantee funds assisted acquisitions of failed banks. Injection of new capital into the larger failed banks, reduction of management costs, and restructuring their lending policies. The Central bank helped Norwegian banking sector and by the end of 1993, the second largest bank raised new equity in the market.
	Market liquidity problems (2008-2009).	The Norwegian interbank market was affected by both the failure of Lehman Brothers and the freeze on international funding markets, which caused a halt in operation. Nevertheless, Norwegian banks did not have credit losses, but they incurred higher funding costs.	Liquidity problems were tackled by the generous general supply of central bank liquidity. The Norwegian State Finance Fund supported the troubled banks with an injection of capital.
Poland	During the recession period in 1990-91, banks raised interest rate spreads to overcome the problems. Lending to enterprises was too risky and banks preferred to lend to the government. The Hyperinflation that followed the transition ended in 1990-91, and the fiscal deficit was reduced. Economic inefficiencies in the centrally planned economy (low productivity of foreign debt-financed investments) and the external shocks, such as the oil crisis and globally rapid increase in interest rates from 1981-1994.	The root of the crisis was foreign public debt growth in concert with the inoperative centrally planned communist economy, oil price shocks and rising global interest rates which resulted in a loss of creditworthiness and an increase in both the risk premium and cost of borrowing. The rapid growth of the public debt in the 1970s brought positive economic impact as debts were paid off by importing of foreign goods, licenses and technology which were a considered as source of foreign currency. However, with the inefficiencies in the centrally planned economy and a competitive global market, Poland ran a trade deficit. By end of 1975, Poland faced insolvency. Poland relied on new loans to pay off old loans which accelerated the growth of the indebtedness. US trade sanctions affected the Polish economy until 1987. As a result, the economic crisis worsened, as well as the loss of creditworthiness which led to an increase in the risk premium and the cost of borrowing.	Several regulatory steps were taken by the Polish government to regain the balance in the economy, to halt the growing domestic demand and excessive investments. These measures were inefficient and required renegotiation of the loan's payment terms. Multiple agreements were introduced to reschedule debt, but proved unsuccessful until restructuring in 1991 and 1994. The Polish financial system had been a mono-bank system, so there were no financial sector interventions until independence in January 1989.



	1992-1996	<p>The bank sector suffered from the following: lack of economic incentives in the centrally planned economy prior to 1989, mismanagement and rapid growth of the sector in the 1990's which negatively affected the resilience of the system. The banking sector was incapable of facing the economic turmoil in the early 1990's.</p> <p>During the transition process 1989-1990, most loans were owned by two state companies. An episode of high/hyper-inflation as well as high interest rates pushed some borrowers into debt spirals. Then, the banking sector in Poland experienced problems, such as an unrestrained credit policy, rapid uncontrolled growth, insufficient or lack of control of mechanisms and corporate governance, a low level of capital, inexperienced managerial staff and weak prudential regulations.</p>	<p>The main focus of NBP (National Bank of Poland) and the government interventions were to restore trust in the banking sector. In 1993, the government had partially guaranteed "bad loans" and commenced issuing restructuring bonds that were transferred to the banks in order to recapitalize. Together with other transfers, the support for the banking system reached to 2.7% of 1996 GDP. In 1995, the Bank Guarantee Fund was established, nevertheless with a limited scale of guarantees. The NBP took some measures to provide liquidity in the market, such as suspension of the obligation to keep capital at the central bank and open access to refinancing loans. To improve the resilience of the system, the banking licenses were tightened and the banks were encouraged to consolidate. The larger banks in Poland and some foreign investors were encouraged to purchase some of small ailing banks in order to restructure them.</p>
Portugal	External trade imbalances, high foreign interest rates and high government deficits from 1983-1985.	The roots of the crisis were due to external trade imbalances, high foreign interest rates and high government deficits.	IMF's assistance to finance the sovereign banks and stabilize the economy, plans to cut back on public investment, a rise in domestic interest rates, coupled privatizations and labor market reforms.
	The US subprime crisis hit the Portuguese banking system's access to funds in the international wholesale markets and caused significant losses in securities and the financial asset portfolio. Later, the Portuguese sovereign debt crisis strained the bank's liquidity situation in terms of funding costs as well as the capacity to access international debt markets. Mostly the domestic imbalance, non-financial private sector indebtedness, and the sovereign debt crisis had an exaggerated the impact of the crisis from 2008-2015.	Signs of distress in the banking system were observed after the nationalization of Banco Português de Negócios. In late 2008, the crisis was significantly escalated due to the Portuguese sovereign debt crisis.	In late 2008, the Portuguese government preserved the stability of the financial system by strengthening the state of guarantees for bank deposits. Headquartered credit institutes had provided by voluntary recapitalization plans and state guarantees to address the securitized debt by Portuguese banks. In April 2011, Banco de Portugal was required to maintain a minimum Tier 1 ratio over 8%. In May 2012, the Economic and Financial Assistance program was established a better and stable financial system and made structural adjustments of the Portuguese economy. The eight major Portuguese banking groups had to generate medium term funding, capital with minimum amount of regulatory capital at all times. Additionally, a program was designed to validate the data on assets and solvency assessment. Furthermore, it had included changes in deposit guarantees funds; a new regulation was established for the minimum Core Tier 1 capital ratio of 9% at the end of 2011 and then 10% from the end of 2012 onwards. The solvency and deleveraging assessment framework was enacted under the Financial Assistance Program; in October 2011

			according to specific risk profile for each institution / banking group.
Romania	External shock (1981-1989)	The 1977 oil crisis and the higher interest rates resulting from the 1982 global debt crisis caused a surge in the cost of the external debt. In 1981, the Romanian debt had been burdened by the rapid increase of the FED interest rates during the late 1970s. By the end of 1981, Romanian banks debt to foreign banks was high, and the IMF declined to waive the stand-by loan without reaching agreement with the foreign banks, then an agreement was signed in December 1982.	The Romanian government implemented tougher measurements to pay back the total amount of external debt after deteriorating international support. In 1988, the Ceaușescu government declined contracting further loans from the IMF and ended its permanent dependence on Western financing.
	Leverage and rapid credit growth as early signs of crisis, liberalization of the exchange rate and liberalization process for the goods with administered prices from 1996-2000.	Systematic errors in previous years, taking risky policies by offering high interest rates (mostly on household deposits) and lending credits to troubled companies with poor financial and economic conditions, or practicing connected lending. Consequently, banks were unable to recover credits and collect interest, causing a steady decrease in profitability, liquidity, and solvency ratios. A very high non-performing loan ratio (over 20% in 1997 – 1998 and 10% in 1996), combined with bankruptcy of the largest domestic bank (Bancorex held more than 20% of the total assets) in 1999. Also, beginning in 1996, many banks faced financial difficulties, such as Dacia Felix Bank, Credit Bank, Columna, Bankcoop and Bancorex forcing them to stop payments as the financial difficulties persisted into 1998. During the liberalization period, the exchange rate and the process for goods with controlled prices contributed to significant currency depreciation and high inflation.	Bankruptcy legislation and National Bank of Romania Act addressed by banking system. In 1996, Dacia Felix Bank and Credit Bank had to be restructured or go into bankruptcy according to legal action took by the National Bank of Romania. In 1997, banks had completed financial corrective measures taken by the NBR's Board of Directors. The central bank cancelled the licenses of two banks in 1997. Granted especial loans to some sectors, off balance-sheet commitments, credit due to mismanagement decisions, etc. In April 1997, the IMF agreed to a 13-month stand-by credit to support the Romanian government's economic program. The National Bank of Romania implemented a package of bank purging measures to heal the banking system as a whole in 1999.
	Leverage and rapid credit growth as early signs of crisis, mismatches and market illiquidity from 2007- 2010.	The Romanian economy was hit by speculative capital outflows, while excessive credit growth built up, high NPL ratios and low profitability. The Romanian capital market acted in a similar manner as its European counterparts. Shortly thereafter, the European sovereign debt crisis led to a rise in the CDS quotes after 2011.	Between September 2008 and June 2012, the monetary authority lowered the policy rate from 10.25% to 5.25% to preserve adequate monetary conditions for both credit demand and supply. The goal was to contain inflation and to spur sustainable economic growth.
Sweden	The combination of inflation, low real interest rates and	This crisis was rooted in the real estate bubble, excessive	The Swedish Government issued a "blanket guarantee" to cover the entire

	deregulation of the financial markets triggered higher real estate prices. Then, a quick drop in real estate prices caused a sharp increase of credit losses from 1991-1997.	lending to the commercial real estate sector and aggravated by the international slowdown. The CRE bubble was caused by de-regulation of bank lending. However, in the mid 1980's, there was a substantial increase in bank lending while the real estate prices declined, thus banks suffered heavy losses.	banking system in September 1992. In 1993, a governmental program was introduced to restructure the failed banks. The government injected capital into banks, while the assets of failed banks were divided into "good"-bank and "bad"-bank parts.
	Mismatches and market illiquidity caused the crisis. Moreover, excessive credit growth, loss of confidence and financial problems in the markets were also key elements of this crisis. Fortunately, there was not a severe level of credit losses, hence "no credit crunch" from 2008-2010.	Even though the crisis was a domestic issue, it was still an external shock to areas with a heavy dependence on short-term international financing and the growth of credit exposures towards the Baltic economies for two of the major banks.	A system of government guarantees offered to the participated banks and capital injections, however, it was limited, and the deposit insurance system covered higher amounts of savings. Moreover, the Central bank (the Riksbank) issued a range of measures to provide liquidity, both in SEK and in foreign currency, as well a quick and sharp reduction of its interest rate.
Slovenia	Mismatches and market illiquidity, exposure concentration from 1991 to 1994.	The Yugoslavian secession hit the Slovene banks in three channels: the liquidity operations were not permitted to Slovene banks; the Yugoslav debtors became unenforceable; Slovene non-financial corporations (owners of the most Slovene banks) had lost access to the Yugoslav market, resulting in impaired bank assets through an increase of loan delinquencies, as well limiting bank recapitalization by the non-government sector.	Bank losses were written off against capital; bank rehabilitation as subordinated liabilities that were government issued and held against non-performing assets acquired and paid for in the agency's own bonds.
	Leverage and rapid credit growth as early signs of crisis: The crisis was due to high leverage, high LTD ratios and decreasing lending standards which caused a severe credit crunch and the reduction of credit availability especially to over-indebted non-financial sector. Mismatches and market illiquidity: Slovenian banking system relied mostly on short-term funding that caused a sharp decline after the outbreak of the last crisis. Exposure concentration: Slovenian economy relied on very specific sectors and tightly connected to the banks' ownership which increased the concentration risk. Misaligned incentives: The management granted excessive amounts of credit without proper risk analysis from 2009-2014.	Banks failed to extend short loans due to the freeze of the wholesale financial markets, thus they caused bad assets in bank books, low loan loss provisions and increased capital requirements. During the financial distress when capital was difficult to raise, a process of deleveraging began while trying to reach the required capital adequacy ratio. Loans issued by the Slovenian Banks were the prevailing source of external finance for the economy, so when their lending rates were increased, their ability to raise funds was diminished.	Banks' recapitalization such as NLB d.d., NKBM d.d., Banka Celje d.d. , Abanka Vipa d.d. as well as Factor banka d.d. and Probanka d.d.; write-down of subordinated instruments; certain non-performing claims were transferred from recapitalized banks to the Bank Assets Management Company (BAMC); BAMC acquired assets paid with guaranteed bonds. The last transfers of NPLs and last recapitalization measures took place in December 2014.
Slovakia	Misaligned incentives. Banks that were to-big-to fail and underlying problems, such as the accumulation of bad loans due to political pressure, the economic structural and legal system after	Started with the liquidity problem of one of the banks in December 1997. In 1998, the banking sector suffered losses from non-performing loans and increasing in NPL ratio before the restructuralisation	The National Central provided a liquidity support for one bank by end of 1997. Three largest banks were recapitalized by the state and the National Bank of Slovakia. Banks' bad loans removed, loans granted to insolvent companies were replaced

	1989 and also weak banks and supervision from 1997-2002.	of up to 50 % in the case of corporate loans. From the end of 1999 to June 2000, the loans that had been granted to insolvent corporates were replaced by government bonds.	with government bonds. Staged restructuralisation process started and banks' privatization was ended by March 2002 as all three banks were bought by foreign banking groups.
United Kingdom	From 1973-1977, leverage and rapid credit growth as early signs of crisis, mismatches in balance sheets. In the early 1970s, the UK credit expansion as well as the economy expanded rapidly ("Barber boom"). The crisis became visible as the liquidity constraints in the money markets. Some financial institutions relied upon liquidity for their operations; sophisticated depositors revised their exposure and further affected the liquidity of institutions.	The crisis was caused by credit expansion (property-related assets). During the depreciation of the sterling in 1973, the BOE (Bank of England) had to raise the lending rate to support the pound. Moreover, access to the wholesale funding market was hammered by the supplementary special deposit scheme which generated significant liquidity constraints. Therefore, the currency crisis indirectly triggered the liquidity crisis, however, the real problem was in the banking sector.	Several supporting measures and rescue strategies were applied to a number of troubled individual institutions. For example, Bank of England assigned and participated in "Lifeboat".
	Leverage and rapid credit growth as early signs of crisis, mismatches in balance sheets from 1991-1994.	In the European Rate Mechanism (ERM) crisis, a fast credit expansion related to property assets was the trigger. Without the support of the authorities, many small institutions had no access to their funds at the Bank of Credit and Commerce International. The ERM required a higher interest rate. This aggravated the economic slowdown and lowered property prices. Next, the unpredictable status of financial institutions constrained wholesale market liquidity for SIB's from a macroprudential perspective.	Emergency liquidity support provided to UK banks.
	2007-present, leverage and rapid credit growth as early signs of crisis, mismatches in balance sheet prior to the 2008 crisis.	The instability was due to a weak financial system that perished during an extended global credit boom; rapid expansion of balance sheets; uncertain liquidity and credit quality; and poorly funding structures.	Bank recapitalization and special liquidity schemes to swap temporarily banks' high-quality mortgage-backed besides other securities for UK Treasury Bills in 2008. Additional supportive measures from the Bank of England, ECB, Federal Reserve, Swiss National and Canadian banks to ease the pressures on short-term funding markets (FSRs in July 2009).

Source: completed by author.

The outcomes of this research are (Rsource: own study):

	Research question	Results	Reasons
1.	Determine whether it is plausible to only focus on the interaction between profitability and macroeconomic factors for future examinations of European banks soundness.	Inconclusive	1. Without supervision, taking into consideration the rating systems outlooks and regulatory (such as Basel III), it is difficult to predict the soundness for the long run. Relying on the Moody's rating outlook and other supervisory institutes may provide a future indication.

Source: completed by author.

## Conclusion

During the crises, European banks heavily addressed the macro profile as well as government and central bank interventions, emergency liquidation, financial stability programs, reconstructing reforms, strength of the supervisors and monetary policies. I conclude that during crises, lending in foreign currency, fiscal discipline, GDP, inflation, high interest rates in foreign currency deposit and loans escalated the problem. With reference to my previous article, any new methodology has to consider the external, industry and internal determinants of profitability in the equation of bank soundness while setting minimum capital requirements, liquidity and bail-in-able liabilities. Therefore, we should strive to improve the existing methodologies and re-regulatory supervision. However, most scholars have focused on the impact of the macroeconomic environment on bank profitability using inflation rates, GDP, and interest rates. Moreover, macro profile, regulatory and supervision, profitability and rating system are also four significant variables in evaluating bank soundness. On the microeconomic level, there is always a possibility to introduce new variables due to new regulatory, or banking supervisory institutions regulations, while at macroeconomic level, the ability to predict these factors positively effects bank soundness. In summary, macroeconomic adjustments were called upon during the crises due to the decline of capital adequacy and deterioration of asset quality as well as losses in both foreign exchange and foreign currency liquidity.

The evidence shown affirms the following statement “is it possible to predict the financial distress in European banks based on systematic financial information and reports, rating system, Basel minimum capital requirements and stress tests, ..., etc.” to absorb any financial crises similar to the collapse of Lehman Brothers, US subprime crisis, financial crisis (2008) and the Asian financial crisis, if there was a prevention mechanism to halt the contagion mechanism. Under these backgrounds, many banking sectors, financial analytics, academicians tended to be against a collaborative effort to build a unified predictive model to ensure the soundness of banks. Therefore, any framework to assess the financial stability must address three main issues: the risks and vulnerabilities of banks individually and world-wide, the type of risks that cause the vulnerabilities and the contagion mechanisms that magnify the impact of the crisis. The next Figure may summarize the most foundations of the topology of Soundness of banks.

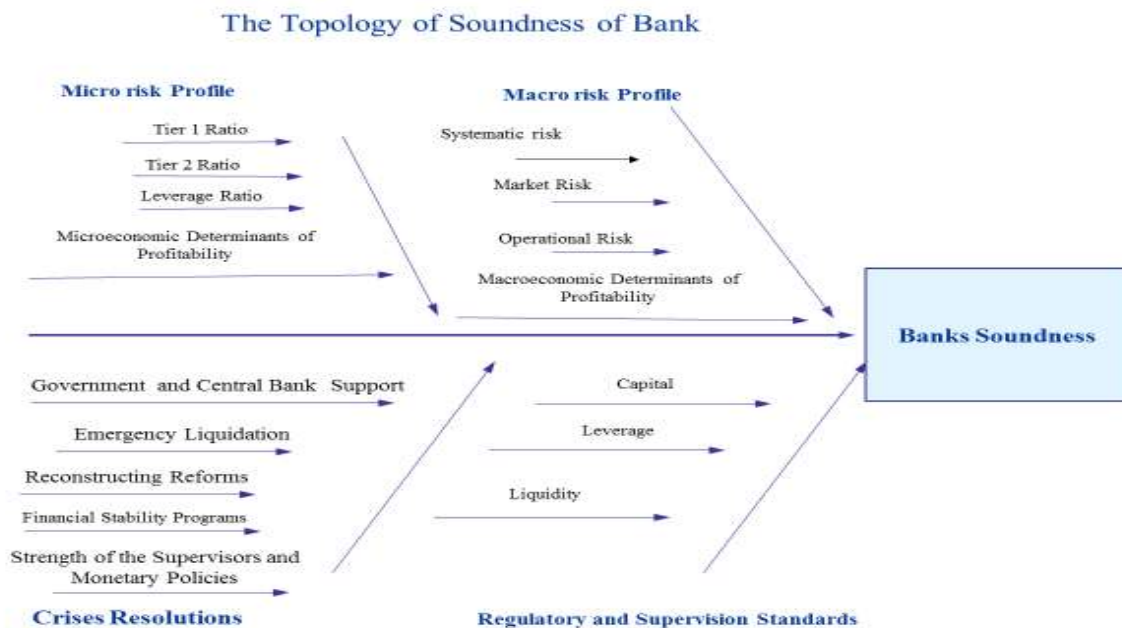


Figure 4: The Topology of Soundness of Banks. Resource: Own study.

Source: completed by author.

## Appendix A

Table 3: The most repeated macroeconomic determinants in selected Empirical Studies

Name of articles	Type of studies	Journal	Variables	Methodology
1. Determinants of Bank Profitability in Ukraine.	Empirical Studies	<i>Undergraduate Economic Review</i>	1. GDP Growth 2. Inflation 3. Exchange Rate 4. Concentration	A linear model of profitability
2. Concentration and other Determinants of Bank Profitability in Europe, North America and Australia.	Empirical Studies	<i>Journal of Banking &amp; Finance</i>	1. Concentration 2. Market Growth 3. Inflation	A linear model of profitability
3. Determinants of Commercial Bank Profitability in Malaysia	Empirical Studies	<i>Journal of Money, Credit, and Banking</i>	1. Inflation 2. Market Growth 3. Market Interest 4. Market Share 5. Regulation	A linear model of profitability
4. What Explains the Low Profitability of Chinese Banks?	Empirical Studies	<i>Journal of Banking &amp; Finance</i>	1. Real GDP growth 2. Inflation 3. Interest Rate 4. Maximum spread between loan and deposit rates 5. Volatility of interest rates 6. Concentration 7. System Credit Growth 8. Interest Rate	Regression Model
5. Factors influencing the profitability of domestic and foreign commercial banks in the European Union.	Empirical Studies	<i>Research in International Business and Finance</i>	1. Inflation 2. GDP Growth 3. Concentration 4. The ratio total assets of the deposit money banks divided by the GDP. 5. The ratio stock market capitalization to total assets of the deposit money banks. 6. The ratio stock market capitalization to GDP.	Regression Model
6. Determinants of bank profitability in a developing economy: empirical evidence from the Philippines	Empirical Studies	<i>Asian Academy of Management Journal of Accounting &amp; Finance</i>	1. GDP Growth Rate 2. Inflation 3. Money supply growth 4. The ratio of stock market capitalization. The variable serves as a proxy of financial development	Linear Regression Model
7. Determinants of bank profitability before and during the crisis: Evidence from Switzerland	Empirical Studies	<i>Journal of International Financial Markets, Institutions and Money</i>	1. Effective Tax Rate 2. Real GDP Growth 3. Interest Rates 4. Concentration	A linear model
8. Determinants of banks' profitability: evidence from EU 27 banking systems	Empirical Studies	<i>Procedia Economics and Finance 20 (2015)</i>	1. Inflation 2. GDP Growth	A linear model of profitability
9. Banks' Profitability in Selected Central and Eastern European Countries	Empirical Studies	<i>Procedia Economics and Finance 16 (2014)</i>	1. Inflation 2. GDP Growth 3. Crisis 4. Concentration	A linear model of profitability
10. Bank-specific, industry-specific and macroeconomic determinants of bank profitability	Empirical Studies	<i>Journal of International Financial Markets,</i>	1. Inflation 2. Cyclical Output 3. Concentration	A linear model of profitability



		<i>Institutions and Money</i>		
11. Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey	Empirical Studies	Business and Economics Research Journal	1. Annual Real GDP Growth Rate 2. Inflation Rate 3. Real Interest Rate	A regression model
12. Profitability of the Korean banking sector: Panel evidence on bank-specific and macroeconomic determinants.	Empirical Studies	<i>Journal of Economics and Management</i>	1. GDP 2. Inflation 3. Concentration 4. The ratio of stock market capitalization	A regression model
13. Financial structure and bank profitability.	Empirical Studies	<i>Journal of Economics and Management</i>	1. Annual Real GDP Growth Rate 2. Inflation 3. Tax Rate	A regression model
14. Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002	Empirical Studies	<i>Money Macro and Finance (MMF) Research Group Conference</i>	1. The Rate of GDP Growth 2. Inflation 3. Concentration 4. The ratio of stock market capitalization to total assets of the deposit money banks. This variable serves as a proxy of financial development as well as a measure of the size of financial market and the relationship between bank and market financing.	A regression model
15. What determines the profitability of banks? Evidence from Spain	Empirical Studies	Accounting & Finance	1. Concentration 2. Annual Real GDP Growth Rate 3. Inflation 4. Interest Rates	A regression model
16. Bank liquidity and its determinants in Romania	Empirical Studies	<i>Procedia Economics and Finance</i>	1. Interest Rate 2. Credit Risk Rate 3. Inflation 4. GDP Real Growth Rate 5. Unemployment	A multivariable regression model and Z-score
17. Profitability Determinants of the Macedonian Banking Sector in Changing Environment	Empirical Studies	<i>Procedia-Social and Behavioral Sciences</i> 44 (2012)	1. GDP Growth Rate 2. Concentration 3. EBRD index 4. Inflation	A regression model
18. Profitability of foreign and domestic banks in Central and Eastern Europe: does the mode of entry matter?	Empirical Studies		1. Concentration 2. Inflation 3. Host Interest Rate 4. Host GDP	A logit model for dependent variables and regression model
19. Determinants of bank Profitability in the South Eastern European region	Empirical Studies	MPRA Paper	1. Inflation 2. Real per Capita Income	A regression model
20. Are Foreign Banks more Profitable than Domestic Banks? Home- and Host-Country Effects of Banking Market Structure, Governance, and Supervision	Empirical Studies	<i>Journal of Banking &amp; Finance</i>	1. GDP Growth 2. Inflation Rate 3. Real Interest Rate	Panzar-Rosse H-statistic to measure Banking Market Structure and regression model

21. Bank-specific, industry-specific and macroeconomic determinants of bank	Empirical Studies		1. Inflation 2. Cyclical Output	A regression model
22. The determinants of banks' profits in Greece during the period of EU financial integration	Empirical Studies	<i>Managerial Finance</i>	1. GDP Growth 2. Inflation 3. The growth of the money supply as measured by currency circulation 4. The ratio stock market capitalization to total assets of the deposit money banks. 5. The ratio total assets of the deposit money banks divided by the GDP 6. Concentration	A regression model
23. How Accurately Can Z-score Predict Bank Failure?	Empirical Studies		1. GDP Growth 2. Inflation 3. Concentration	Z-Score Methodology
24. Consolidation in banking and financial stability in Europe: Empirical evidence	Empirical Studies	<i>Journal of Banking &amp; Finance</i>	1. Concentration 2. GDP per Capita 3. Real GDP Growth 4. Inflation 5. Real Interest Rate 6. Credit Growth	Z-Score
25. Competition, Efficiency, and Stability in Banking.	Empirical Studies	<i>Financial Management</i>	1. GDP per Capita 2. Concentration	Bonne Model, Z-Score Methodology
26. The Main Determinants of Bank's Stability. Evidence from Romanian Banking Sector	Empirical Studies	<i>Procedia Economics and Finance</i>	1. Inflation Rate 2. GDP Growth Rate	Z-Score Model
27. Does market structure matter on banks' profitability and stability? Emerging vs. advanced economies.	Empirical Studies	<i>Journal of Banking &amp; Finance</i>	1. Real GDP Growth 2. Stock market turnover ratio 3. Inflation 4. Concentration	Z-Score Methodology and regression model
28. Basel Core Principles and bank soundness: Does compliance matter?	Empirical Studies	<i>Journal of Financial Stability</i>	1. GDP Growth 2. Inflation 3. Exchange Rate	Z-Score Methodology and regression model
29. Bank Safety and Soundness and the Structure of Bank Supervision: A Cross Country Analysis	Empirical Studies		1. Concentration 2. GDP per Capita 3. Average Rate of Real GDP Growth	CAMEL variables as well as regression model
30. Banking on the principles: Compliance with Basel Core Principles and Bank Soundness.		The World Bank	1. BCP Index 2. Rule of Law 3. GDP per Capita 4. Depreciation 5. Growth 6. Inflation 7. Inflation Volatility	Z-Score, Moody's Rating, and Regression model

Source: Own study.

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### Footnotes Page

1. Part 1, A framework for assessing financial stability, Maurizio Trapanese (Bank of Italy).
2. Full sample (All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework). Domestic banking groups and stand-alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
3. Full sample (All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework). Domestic banking groups and stand-alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
4. Full sample (All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework). Domestic banking groups and stand-alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
5. Dataset Source : <sup>[1]</sup>Oesterreichische Nationalbank (Austria), <sup>[2]</sup>Banque Nationale de Belgique (Belgium), <sup>[3]</sup>Central Bank of Cyprus, <sup>[4]</sup>Deutsche Bundesbank (Germany), <sup>[5]</sup>Bank of Estonia, <sup>[6]</sup>Banco de Espana (Spain), <sup>[7]</sup>Bank of Finland (Finland), <sup>[8]</sup>Banque de France (France), <sup>[9]</sup>Bank of Greece (Greece) (GR2), <sup>[10]</sup>Central Bank of Ireland (Ireland), <sup>[11]</sup>Banca d` Italia (Italy), <sup>[12]</sup>Bank of Lithuania, <sup>[13]</sup>Banque centrale du Luxembourg, <sup>[14]</sup>Bank of Latvia, <sup>[15]</sup>Central Bank of Malta, <sup>[16]</sup>Nederlandse Bank (Netherlands), <sup>[17]</sup>Banco de Portugal (Portugal), <sup>[18]</sup>Bank of Slovenia, <sup>[19]</sup>National Bank of Slovakia
6. Full sample (All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework). Domestic banking groups and stand-alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
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8. Full sample (All banking groups / stand-alone banks irrespective of their accounting / supervisory reporting framework). Domestic banking groups and stand-alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.
9. <https://www.ecb.europa.eu/pub/pdf/annex/ecb.fcdb20170731.en.xlsx>
10. The references are mentioned in European Central Bank (Jul 31, 2017), <https://www.ecb.europa.eu/pub/pdf/annex/ecb.fcdb20170731.en.xlsx> (date of visiting 21).