Financial Cycles and Macroprudential Intervention in Selected Central and Eastern European Countries

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Abstract
The length and severity of the 2008 crises has increased the interest in the study of financial cycles arguing that they are closely related to economic cycles.Under these circumstances, macroprudential regulations are, presently, the main focus of banking authorities, but country specific approaches should be integrated in a wholesome vision in order to avoid futher contagion.
The paper discusses the determinants of the crises in five CEE countries Czech Republic, Poland, Hungary Romania and Bulgaria in relation with the financial cycle as well as the need of macroprudential intervention in order to prevent severe crises and induce sustainable development. The research method relies on statistical data analysis and diagram based visualization. For the purpose of the paper, the study identifies the main determinants of the financial crises in these countries, showing the need for country-level financial cycle estimates to provide a clear and consistent yardstick to guide forward-looking macro-prudential policy.

Keywords: financial cycles, macroprudential regulation, financial supervision
JEL codes: E58, G10, G18, G20

1. Introduction

”Understanding in economics does not proceed cumulatively. We do not necessarily know more today than we did yesterday, tempting as it may be to believe otherwise. So-called “lessons” are learnt, forgotten, re-learnt and forgotten again. The notion of the financial cycle and its role in macroeconomics is no exception.” (Borio, 2012). Further on, Borio (2013) argues that the understanding of the financial cycle and its drivers, as well as policy-makers' awareness of the actual phase of the cycle, is essential for the conduct of macro-prudential policy, while Detken et al. (2013) stress the importance of macro-prudential counter acting measures, such as time-varying capital buffers. During the last decades, academics and practitioners, as well, endeavoured to obtain a better understanding of the „financial cycle", concentrating on the empirical, positive side of their research rather than on its normative side. The positive approach may be explained by the fact that the global economy includes nowadays a wide range of economies (developed, emerging, transition, underdeveloped, etc.) needing a large set of data and evidence to explain its current state and future evolution. Moreover, as opposed to globalization, glocalisation tends to emphasise local characteristics and competition, often sharpening economic and financial cycles.

Central and Eastern European countries (CEE) are no exceptions, recent history showing that past experiences are repeted, hindering recovery and long term development. The actual state of their economies is, on one hand, the outcome of their past (economic, social and political) evolution and, on the other hand, of their vulnerabilities induced by contagion as part of the global market.

CEE countries have undergone a winding path of economic and financial evolution as transition and emerging economies after 1990 and as EU members after 2004 that forced decision makers to permanently reconsider their economic policies, strategies and objectives. As part of the global markets, the 2008 crises affected CEE countries, albeit differently, often revealing their inner weaknesses but also enhancing their potential. Each of the countries considered in the study (Czech Republic, Poland, Hungary, Romania, Bulgaria) have faced the challenges raised by the recent crisis in the context of their own economies but also as member states of the EU.

A considerable impact on the policy decision making process, dealing with economic and financial cycles, is the financial market structure and institutions that can be bank or capital market oriented, either of them being able to stabilize or induce vulnerabilities. Financial systems in CEE countries are traditionally based on the banking system rather than on the capital market that, up to a certain extent, prevents large scale contagion. On the other hand, these countries lack an important buffer, i.e. capital markets that are able to absorb shocks and flatten cycles.

Indeed, during the last 25 years, the banking sector has been the most important financial intermediary in these countries but also subject to continuous structural changes. The creation of the two tier banking system, the privatization of domestic banks in the 1990s, the legal provisions stating the independence of Central Banks and the relatively high return on capital became attractive, branches of foreign banks being established in these countries, largely contributing to the fast growth of loans. In some of the CEE countries, foreign banks have engaged in aggressive lending to the private sector in order to raise their share in these profitable markets; this has resulted in downward pressure on lending rates and has helped stimulate credit demand (Hilbers et al., 2005).

Nevertheless, while beneficial for the economy, the increased lending process also triggered asymmetric information, moral hazard and adverse selection, with negative consequences on banks and borrowers as well. Moreover, the structure of loans remained often unbalanced, inducing a squeezing the lemon behaviour by preferring the real estate sector, rather than other investments, that later, at the outburst of the crises in 2008, proved to be the most vulnerable and raised concerns about macroeconomic and prudential risks. As past experiences of developed and emerging market countries suggest, credit booms can be associated with unsustainable domestic demand booms, overheating, and asset price bubbles. The new market circumstances in the CEE countries, the output gap as well as the low competition allowed massive capital inflows through FDIs, portfolio investments and loans that supported economic growth and complemented the inadequate domestic capital. Consequently, both demand and supply led to the pre-crisis lending increase (Grela et al., 2015).

The objective of the paper is two folded: *a)* to analyse to what extent mainstream economic theories explain the correlation of economic and financial cycles in selected CEE countries and *b)* to analyse the types and effectiveness of the macroprudential approaches used in these countries. Considering the purpose and length of the paper, the study relies on statistical analysis of data and diagrams, considering that such an approach has the ability to illustrate complex ideas and is more direct in terms of both visual and verbal communication.

The first part of the paper reviews the general determinants of economic cycles, as well as the close connection between the financial cycle and financial crises, while the second part discusses the role and outcome of macroprudential regulations in the selected CEE countries.

2. Financial Cycles and Macroeconomic Instability

2.1 Literature Review

The increased interest in the study of financial cycles emerged once the long upward trend of the markets in the early 1990s ended with synchronised cyclical downturnsin 1997, when the outburst of accumulated tensions set the future trend of global economic development. After a decade of relative growth, also supported by the CEE new markets that allowed a repositioning of the capital, the global economy was again, in 2008, confronted with a deeper and longer crisis determining researchers to reconsider financial cycles on new grounds, by including emerging economies in their study.For a long time, mainstream economists considered financial determinants as irrelevant, a mere "veil" that can be ignored in efforts to understand the business cycle (Woodford, 2003) and in the best case, the inclusion of financial factors in macroeconomic models result in a slight increase in the persistence of cyclical fluctuations and delay the return to the natural state of balance (Bernanke et al., 1996).

Obviously, because of the complexity of the topic there is no consensus on the definition of financial cycles. According to Borio (2012), the concept denotes self-reinforcing interactions between perceptions of value and risk, attitudes towards risk and financing constraints, which translate into booms followed by busts. These interactions can amplify economic fluctuations and possibly lead to serious financial distress and economic dislocations. This analytical definition is closely tied to the

increasingly popular concept of the "procyclicality" of the financial system (Borio et al., 2001, Danielsson et al., 2004, Kashyapandand Stein, 2004).

Another line of economic theory describes financial cycles indirectly, adopting a long term view and disregarding analytical goals (Goodhart and Hofmann, 2008, Schularick and Taylor, 2012, Aizenman et al., 2013, Borio et al., 2013), while other studies consider financial determinants as main indicators in early warning systems (Borio and Lowe, 2002 and 2004, Borio and Drehmann, 2009, Alessiand and Detken, 2009).

Considering that the recent crises was triggered by credit crunch, Aikman et al. (2010) investigate credit cycle characteristics across 14 developed economies, over a 38 year time frame (1870–2008) to depict to what extent they are related to financial crises. Deepening the analyses, Claessens et al. (2011 a, b) study cyclical movements of credit, housing and equity prices for 21 developed economies, from 1960 to 2007. Both analyses provide evidence of high synchronicity of individual series, in particular between the credit and house price cycle. The paper by Drehmann et al. (2012) is the first attempt to construct a synthetic financial cycle measurement tool, by combining medium term fluctuations of financial variables for seven developed countries from 1960 to 2011. They conclude that credit aggregates and house prices are correlated, whereas equity prices tend to be destructive rather than beneficial.

To summarise, the main distinguishing features of financial cycles, identified by Borio (2012), are the following:

1. The financial cycle has a much lower frequency than the traditional business cycle (Drehmann et al., 2012). As traditionally measured, the business cycle involves frequencies from 1 to 8 years: this is the range that statistical filters target when seeking to distinguish the cyclical from the trend components in GDP. By contrast, the average length of the financial cycle in a sample of seven industrialised countries since the 1960s has been around 16 years.

2. The most parsimonious description of the financial cycle is in terms of credit and property prices (Drehmann et al., 2012). The combination of credit developments and evolutions in real estate prices best captures the link between financial cycle, the business cycle and financial crises. These variables tend to co-vary rather closely with each other, especially at low frequencies.

3. Peaks in the financial cycle are closely associated with systemic banking crises. The close association of the financial cycle with financial crises helps explain another empirical regularity: recessions that coincide with the contraction phase of the financial cycle are especially severe. On average, the GDP drops by around 50% more than otherwise (Drehmann et al., 2012).

4. The close link between the financial cycle and financial crises underlies the fourth empirical feature: it is possible to measure the build-up of risk of financial crises in real time with fairly good accuracy.

Specifically, highlighting the most significant predictors of financial crises is based on positive simultaneous deviations (gaps) of the relation (private sector) credit - GDP and asset prices especially house prices (Borio and Drehmann, 2009).

5. The length and amplitude of the financial cycle are no constants of nature, of course; they depend on the policy regimes in place. Three factors seem to be especially important: the financial regime, the monetary regime and the real-economy regime (Borio and Lowe, 2002).

As evidence shows, credit growth also has implications for financial stability. Kaminsky et al., (1997), in a survey of the literature, find that five out of seven studies show that credit growth can be an important determinant of banking and/or currency crises. Goldstein (2001) provides evidence on the link between a credit boom and the likelihood of twin crises (banking and currency crises) as a result of capital flows. Similarly, a study of International Monetary Fund (IMF, 2004) concludes that credit booms pose significant risks for emerging market countries, as they are generally followed by sharp economic downturns and financial crises.

All these rich empirical studies rely on the nominal side of the economy, often disregarding the characteristics of the real economic indicators. In order to cover the entire set of determinants that shape economic and financial cycles, in-depth analyses on the real convergence of economies, complemented by behavioural aspects of the investment decision making process would be useful in identifying the core causes of vulnerabilities on the economic and financial markets. For the accuracy and reliability of the research outcome, country and region specificities should be considered, conclusion that is applicable for the CEE countries as well.

2.2 Financial Cycles in CEE Selected Countries

Cyclical movements in financial markets have greatly influenced real economies worldwide during the last two decades. According to Minsky (1992), market economic and financial systems are unstable, susceptible to crises and subject to endogenous and exogenous influences, as well.

During the last decades, CEE countries went through an extensive reformation of their financial systems. While the newly established capital markets remained quite narrow, banks became the prevailing financial intermediaries. The banking systems were reorganised on a two tier bases, domestic banks privatised and the Central Banks became the monetary and supervisory authorities.

Once capital accounts were liberalised, massive financial inflows were recorded and foreign banks entered these markets, by setting up branches and subsidiaries or by franchising. The insufficient supervision and strength of the financial systems also allowed speculative entries and attacks on domestic currencies and thus the CEE countries were subject by contagion, in the second half of the 1990s, to foreign exchange crisis and financial crises.Clarke et al., (2001) suggest that the degree of economic integration between a foreign bank's home country and the host country, the market opportunities available in the host country, and entry restrictions and other regulations (including tax treatment) have all affected the pattern and timing of foreign entry. Although what draws the foreign banks are growing and developing markets, under-banked or uncompetitive banking sectors are also affected by their entry, because the foreign banks change the environment to the better (Tschoegl, 2003).

Undoubtedly, foreign banks' entry induces positive externalities, i.e.: increased the effectiveness of the domestic banking sector due to competition, the allocation of loans to the private sector was improved, reduced the costs associated to the post crises recapitalization of banks, up to date know how, changed the perception on the banking system, etc. On the other hand, the costs of foreign bank entry may be associated with the following aspects: the number of foreign banks outweighs domestic ones, foreign banks attract the most profitable share of the market, access to loans was denied to vulnerable sectors, often banks preferred short/medium term lending, consumers lending was preferred to investment lending, etc. Untimely liberalization of the capital account may induce the concentration of speculative inflows that seek high profit, housing bubbles, forex fluctuation, may trigger financial instability and, eventually, an apparent economic growth and enthusiasm can be followed by long crises and stagnation (Donath, 2008).

For the purpose of the analyses, the evolution of the GDP real growth rate was considered for the economic cycle and the growth of annual lending to the private sector for the financial cycle, for a 13 years time frame (2000-2013). At the beginning of the 21st century, the capital accounts in the selected CEE countries (Bulgaria, Czech Republic, Hungary, Poland and Romania) have been liberalized and their economies started an upward trend. Nevertheless the evolution of these economies was inconsistent with the degree of sustainability of the economic policies, of market mechanisms, macroeconomic imbalances and economic behaviour. Figure 1 shows that during 2000-2008, Bulgaria, Czech Republic and Poland had a rather stable growth, with no excessive peaks: The Bulgarian economy expanded by an average of 5.6% per year during 2004-2006 (but, afterwards declined sharply to -5% in 2009); the Czech economy grew constantly reaching a peak of 6% in 2006 (but fell until 2009 to -5%), while Poland managed a more sustainable evolution of the GDP (reaching a 6.5% peak in 2007, then falling to 2.5% in 2009, recovering to 5% growth in 2011 and stabilising to 2.63% in 2013) maintaining a positive level throughout the entire time frame, with the slowest decline in 2008 at the outburst of crisis.

Bulgaria had a slow recovery, reaching 1.5% in 2014 and expecting a 2.7% growth in 2017. The Czech economy returned to a 2% growth in 2014, after slightly contracting in 2012 and 2013 due to foreign demand, increased gross capital formation, as well as household and government final consumption expenditure (Grela et al., 2015).

The Hungarian economy, despite a good start in 2000 and maintaining an average growth of 4% until 2006, fell sharply afterwards reaching -6.6% in 2009, its worse contraction since 1991. A US $25 billion rescue package to prevent the Hungarian economy from collapsing was considered. (Grela et al., 2015).The economy resumed growth in 2010, reaching 2.6% in 2013. However it contracted again by 1.5% in 2012, amidst high debt, high unemployment and the Eurozone debt crisis.

The Romanian economy was the most volatile with sharp growth in 2004, 2006, and 2008 to 8% and equally significant falls to -4% in 2005 and to -8% in 2009. Growth is related mostly to consumption (triggered by the increase of consumer loans) as well as real estate bubbles.

Figure 1: GDP Real Growth Rate
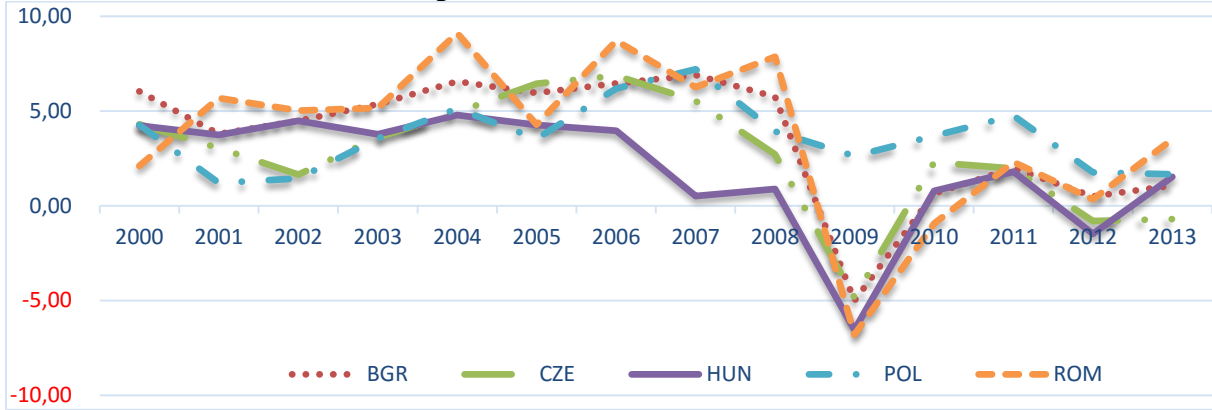
Source: World Bank

Figure 2: Domestic Credit to Private Sector by Banks –Annual Growth Rate
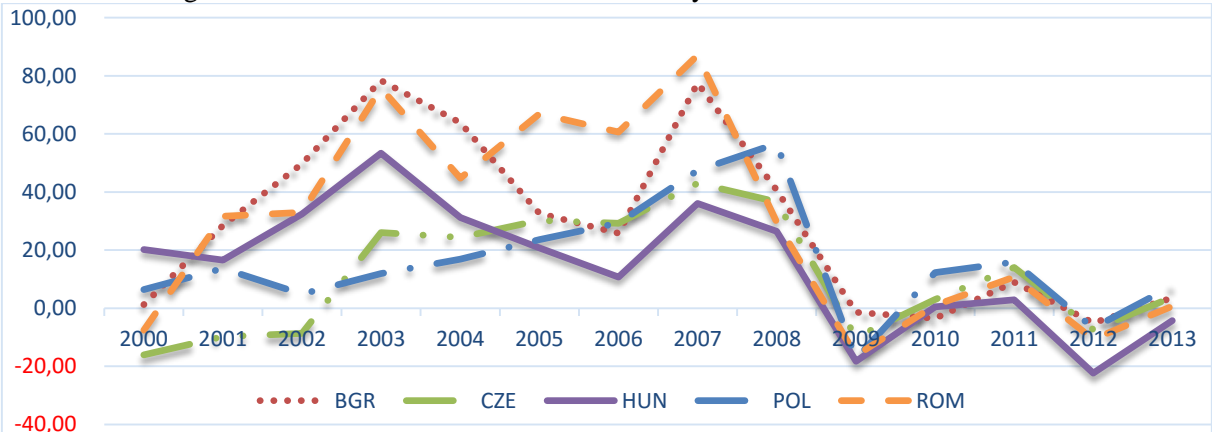
Source: World Bank, author's calculation

Under these macroeconomic circumstances, the evolution of lending in the considered CEE countries was sharp following, to a certain extent, the trend of the GDP. A lending boom is noticeable during 2000 and 2004 for Bulgaria, Hungary, Romania and the Czech Republic, while in Poland the upward trend was slower reaching its peak in 2008, prior to the crises. The credit cycle was more synuous in Romania, reaching the highest peak in 2008 (growing by 80% as compared to its level in 2000), but sharply falling in 2009. The volume of loans in Bulgaria and Hungary fell in 2006 but recovered in 2007, before collapsing in 2009.

As Figure 2 shows, except Poland and the Czech Republic were the trend of lending follows the evolution of the GDP, in the other three countries (Bulgaria, Hungary, Romania) the financial cycle, described by the evolution of domestic credit is shorter than the economic cycle, meaning that economic measures were not consistent with the financial ones. The severity of recession in all the five countries is reflected by the W shape of the financial crisis, as lending fell in 2009, resumed growth in 2010-2011, dropped again in 2012 to the 2009 level, then started to grow again in 2013. The difficulty of maintaining the upward trend shows the need of more sustainable macroprudential tools that will be discussed in the next paragraph. The correlation between the evolutions of the GDP and lending is shown in Figure 3.

Figure 3: The Correlation between the Evolution of the GDP and Lending
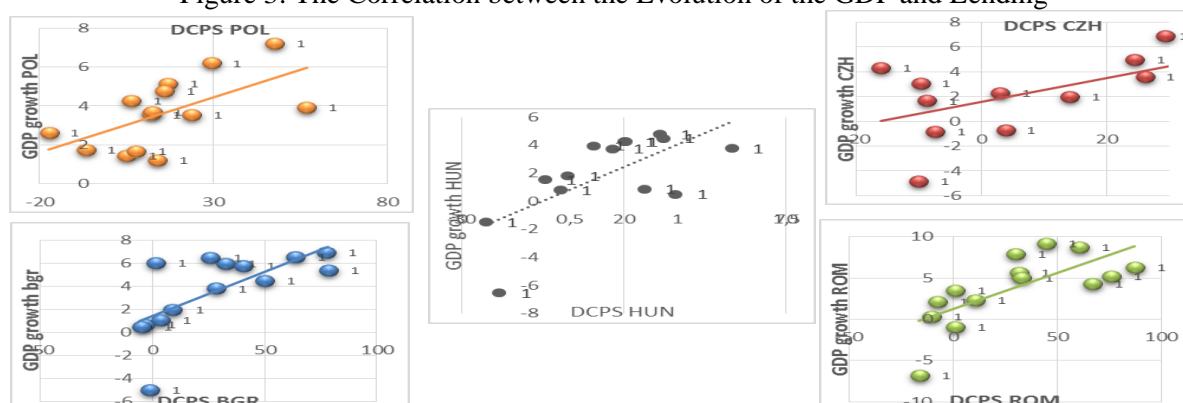
Source: World Bank, author's calculation

Lending booms embedded both opportunities and challenges to economic policymakers. On one hand, the surge in financial intermediation reflects a welcome catch-up from low levels recorded in the 1990s, and financial deepening was generally associated with increased growth and efficiency. On the other hand, fast lending growth has been associated with macroeconomic and financial crises rooted in macroeconomic imbalances and banking sector distress already cumulated in the past decade. In the aftermath of the crises, policymakers presently face the dilemma of how to minimize the risks of financial crisis while still allowing bank lending to contribute to higher growth and efficiency (Duenwald et al., 2005).

To be noticed that the expansion of bank loans in the considered CEE countries coincided with the global financial boom that has intensified financial flows to these countries, allowing for an abundance of funds. In the absence of a buffer (i.e. a functional capital market) and functional real economies that would have had absorbed the excess money, the inflowing funds were mainly allotted to consumption and real estate lending which has raised concerns about whether this trend was simply a manifestation of convergence to the average credit levels in developed countries or, whether it was a case of excessive growth posing a risk to macroeconomic and financial stability (Hilbers et al., 2005).

Figures 1 and 2 confirm Minsky's hypothesis (1992) regarding financial instability generated by the inclination of to over-indebted private sector in the upward phase of the economic cycle. Thus, the pre-crisis GDP in the considered CEE countries fuelled overoptimism concerning the evolution of real estate prices and future incomes as well as the ability of reimbursing loans triggering the demand of new loans. Moreover, borrowers preferred loans denominated in a foreign currency, perceived as more stable, but future developments (i.e. the Euro crises and stronger Swiss franc/dollar) created an adverse effect impacting on repayments. Real housing prices developments differed substantially across countries in the CESEE region over the sample period. Vandenbussche et al., (2012) show that there was a pronounced boom and bust cycle over the last decade in the Baltic countries, while in other countries the real house price inflation was more contained (Figure 4). They find that higher capital ratios and marginal reserve requirements on foreign funds have a dampening impact on house price inflation.

Figure 4: House Price Index –Annual Growth Rate
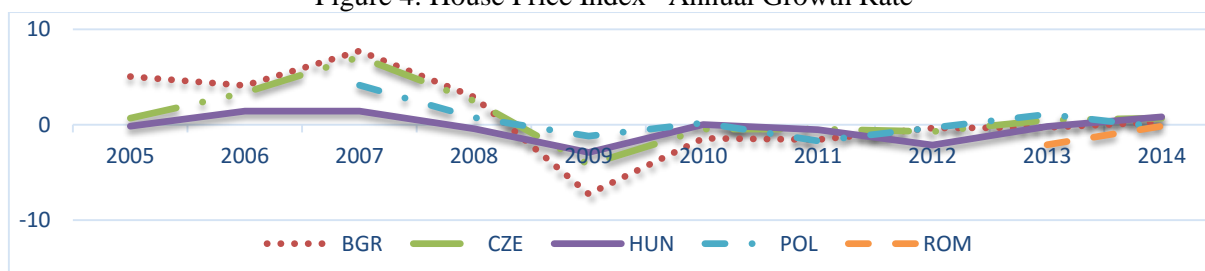
Source: Global property guide website

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It can be argued that the evolution of cycles in CEE countries had, besides economic, financial and determinants, emotional reactions concurred to the evolution of the cycles. Once the trend of the market was reversed, overpessimism replaced overoptimism, risk aversion became predominant on the demand and supply side as well, and tighter economic circumstances induced banks to restrict crediting even allowing for adverse selection. Consequently, real estate prices recovered very slowly after the sharp decrease in 2009. Presently, under the new bank market conditions that promote historically low interest rates, fuelled also by the liquidity trap, the housing demand is increasing alongside the real estate prices.

The challenge that the CEE countries have to face, further on, is whether their economic growth will be supported mainly by real estate development, that eventually will lead again to bubbles and crashes, or measures should be taken to restore economic growth by supporting, through lending, the production side of the economy in a sustainable manner, not only the consumption side.

We think that besides the nominal side of the economy, that undoubtedly has its potential to trigger growth, decision makers should rather concentrate on the real economic development. Once real convergence (through productivity, exports, ITC, economic restructuring, competition, etc.) with the developed economies is ensured, there will be room for a more sustained development in the entire region preventing severe crisis.

3. The Role of Macroprudential Policies

3.1 Macroprudential Policies Revisited

The development of the recent financial crises (its depth, length, the inability of the markets to restore investors' credibility, etc.) raised intense discussions concerning the need for macro-prudential policy tools to mitigate the build-up of systemic risk in the financial system and to enhance the resilience of financial institutions. It can be argued that the main purpose of macro-prudential policies is to prevent and slow the intensity and dynamics of financial cycles, given that price stability is not sufficient for achieving financial stability. The measures that can be considered in this respect are:

Capital-based measures. In Europe, the CRR/CRD IV already includes: countercyclical capital buffer, systemic risk buffer and capital add-ons for systemically important institutions. It also includes large exposure limits and sectoral risk weights to real estate lending's (European Systematic Risk Board- ESRB, 2014). Evidence suggests that capital-based measures tend to focus on building resilience and are hence applied in a static way that have rather indirect and possibly limited effects on cyclical adjustments and the costs of loans. (Basel Committee on Banking Supervision - BCBS, 2010)

Limitation of households' and non-financial corporations leverage. Borrower-based instruments, such as loan-to-value (LTV), loan-to-income (LTI) or debt service-to-income (DSTI) limits are on the whole thought to be among the most effective macroprudential instruments in curtailing excessive credit growth. These instruments are presently used more often in developed economies than in developing ones. Nevertheless, most countries apply systemic risks (induced by intra-financial system vulnerabilities) reduction policies. These prudential policies seem more effective in lowering high credit growth rates, but they provide little support during the down slope of the cycle (Ceruttiet al., 2015).

In the European Union, spillover effects that derive from the implementation of macro-prudential measures can entail positive as well as negative effects. Therefore, assessing the potential cross-border effects of macro-prudential measures in safeguarding financial stability is an essential, as well as complex procedure.

There is a rich literature on the connection between macroprudential policies and financial stability. It includes, on one hand, cross-country studies that analyse the connection between macroprudential policies and credit growth and other financial indicators. Lim et al. (2011) find that some of the most common macro-prudential measures were effective in a cross-section of 46 countries between 2000 and 2010. More specifically, tightened LTV and DTI ratios, reserve requirements, dynamic provisioning and ceilings on credit growth (denominated in domestic and in foreign currencies) seem to reduce the pro-cyclicality of credit growth. (Kuttner and Shim, 2013) investigate housing related measures for 57 countries during 1980 to 2011, concluding that macroprudential policies have been effective in dampening housing prices and credit without differentiating the

effectiveness of various applied measures. On the other hand, there are cross-country studies that focus on the connection between macroprudential policies and the risks embedded by financial crisis. Dell'Ariccia et al. (2012) find that macroprudential policies can reduce the incidence of general credit booms and decrease the probability that an abrupt landing and disruptions in the real economy induced by the vulnerabilities in the financial system. Claessens et al. (2013) investigate how changes in balance sheets of individual banks in 48 countries over 2000-2010 respond to specific policies, finding that measures aimed at borrowers−LTV and DTI caps, credit growth and foreign currency lending limits−are effective in reducing the growth in bank's leverage, asset and noncore to core liabilities growth. It also proves that countercyclical buffers help mitigate incrases in bank leverage and assets, but they are less effective-FC in adverse times.It is also true, that since financial institutions can be subject to "irrational exuberance" (Minsky, 1992), the industry is inclined towards financial innovation and leveraging to increase profits, the positive impact of macro prudential regulations being hampered.

There are few in-depth studies concerning macroprudential policies in CEE countries, given their specific economic and social background that has shaped the evolution of their bank systems. Moreover, as part of the global economy, their restructuring also meant a higher exposure to contagion to risks that require effective macroprudentional regulations.

3.2 Macroprudential Measures in Bulgaria, Czech Republic, Hungary, Poland, and Romania

Cerutti et al. (2015) find that macroprudential polices are used more frequently in emerging economies, where foreign exchange related policies are used more intensively. It is arguable though, that the impact of macroprudential policies varies according to the intensity and phase of the financial cycle, but are more effective when the financial cycle is more intense and real estate price sharply increases. Therefore, macroprudential policies are meant to be used, mainly, as ex-ante tools, that is, they should prevent a steep evolution of the financial cycle. Statistical data show that macroprudential policies are generally associated with a decrease in lending growth rate and can have some impact on growth in house prices.

The considered CEE countries have adopted various scale measures to deal with the risks stemming from excessive credit growth, especially foreign currency lending. As Table 1 shows, Hungary, Poland and Romania have been the most active countries in terms of the number of measures that have been implemented. Czech Republic preferred a limited intervention, i.e. countercyclical capital and systemic risk buffer despite a non-negligible share of foreign currency loans to non-financial corporations. (Kok et al., 2014)

Table1: Macroprudential Policies in Selected CEE Countries during 2000-2014

Country / Macroprudential measures		Bulgaria	Czech Republic	Hungary	Poland	Romania
Capital-based measures	Risk-weights	X			X	X
	Maximum ratio of FC loans to own funds					X
	Countercyclical capital buffer (CCB)		X			
	Systemic risk buffer (SRB)	X	X			
Borrower-based-measures	Loan-to-value (LTV)			X		X
	Loan-to-value-FC (LTVFC)			X	X	
	Debt -to-income (DTI)			X	X	X
	Debt-to-income FC (DTIFC)			X	X	X
Provisioning measures		X			X	X
Other measures	Quantitative limits on FC- lending as a share of total lending			X		
	Loan maturity (consumer loans with a maturity of more than 5 years are not allowed)					X
	Restrictions on foreign currency (FC) mortgage lending			X		

Source: Vandenbussche et al. (2012), Kok et al. (2014), ESRB (2015)

After joining the EU in 2004, Poland experienced a strong expansion of output and credit, triggering the increase of foreign currency denominated mortgage loans granted to households. Under these circumstances, the authorities considered the expansion of lending to be risky because any depreciation of the Polish zloty, increase in Swiss franc interest rates or a deterioration of macroeconomic conditions would severely undermine households' mortgage repayment capacity. In response, in 2006, the authorities issued "Recommendation S", addressed to banks, which marked the start of a series of macro-prudential measures meant to reduce the risks stemming from foreign currency lending. In 2007, the authorities raised risk weights for foreign currency mortgage loans to households and introduced binding liquidity limits in 2007, which took effect in mid-2008, thus helping banks to prevent liquidity stress in 2008-2009. The intensification of the financial crisis in 2008 put an end to the fast credit expansion in Poland as banks tightened lending standards and consumer confidence worsened. Between the end of 2010 and early 2011 the authorities introduced more stringent DTI ratios for foreign currency-denominated loans to unhedged borrowers (Recommendation T and amendments to Recommendation S) and in mid-2012 they further raised risk weights for foreign currency-denominated retail exposures. Since mid-2012, the issuance of foreign currency mortgage loans has been minimal and old loans are not renewed which means that the total stock of foreign currency loans is diminishing. From July 2014, borrowers are allowed to borrow only in the same currency as their income. (Kok et al., 2014)

Romania experienced a particular evolution during January 2005 to June 2008, since household disposable income grew at an average annual rate of around 20%, while household debt increased at a rate of 77%. Consequently, lending outgrew domestic funding sources, the gap being covered by foreign funding, primarily from parent banks. Against this backdrop, the Romanian authorities started to reduce the risks stemming from foreign currency lending, by introducing, during 2003 -2007, DTI and LTV caps. The LTV caps were differentiated by the type of borrower and currency and, for setting DTI maximum levels, the income risk was added to interest rate and currency risks. The Romanian authorities assessed that it was more difficult to circumvent the DTI and LTV caps compared to other macro-prudential measures, since the address the credit risk ex ante. Later, in September 2005, the authorities introduced a ceiling on credit institutions' exposures to a maximum of 300% of their equity when granting foreign currency loans to unhedged borrowers. The measure was abandoned when Romania joined the EU in 2007. The Romanian authorities consider that the country's experience with DTI and LTV caps shows that these instruments are efficient (i) in curbing high credit growth and (ii) and thus both debtors and creditors are able to withstand possible adverse shocks in real estate prices, domestic currency depreciation or interest rates hikes (NBR Stability Report 2014).In 2008, more conservative lending standards for household loans were introduced. This new regulatory framework provisioned a mandatory evaluation of borrowers' debt repayment capacity in a stress scenario over the entire life of the loan, incorporating adverse scenarios for interest rate and currency risks. Starting with 2011, the Romanian authorities imposed stricter standards for foreign currency loans granted to households (especially for Swiss franc and USD-denominated loans), in line with ESRB recommendations on foreign currency lending.

In Hungary, private sector credit grew faster than the nominal GDP during the 2000s leading to an increased debt service burden that was reversed after the onset of the financial crisis in late 2008 and in 2009. The process has been driven by more relaxed lending standards, particularly households' loans with longer maturities, and higher LTV and DTI ratios for housing mortgages. In March 2010, lower maximum LTV ratios for mortgages and car loans in foreign currency were introduced later extended, in June 2010, for DTI ratios for foreign currency-denominated loans. These measures, together with increased customer awareness of the exchange rate risks attributable to high exchange rate volatility, are likely to have contributed to lower demand for foreign currency loans in the first half of 2010. Moreover, to prevent the prohibition on foreign currency-denominated mortgage lending, effective from August 2010, practically eliminated such lending by the end of that year. In July 2011 the authorities reintroduced foreign currency lending, albeit with very tight credit conditions.

Bulgaria targeted measures on overall credit growth and asset price growth, such as credit ceilings, differential risk weights, and countercyclical provisioning requirements. A macroprudential approach consistent with the macroeconomic policy mix appears to have worked better in this country, where fiscal policy was countercyclical and worked in concert with macroprudential policy (Lim et al., 2011). The Bulgarian National Bank has decided to apply a uniform systemic risk buffer (SRB) rate

3%, for the all domestic banks exposures, started 1 October 2014. The reasons given for introducing the systemic risk buffer, reflecting the features of the domestic economy such large macro-economic imbalances, volatility and vulnerability to external shocks, presence of currency board and impact for monetary and fiscal policy, weak economic environment.

Evidence presented in Figure 5 shows that such measures appear to have been effective in curbing lending in foreign currency, although the impact in most cases appears to weaken shortly after the policies are implemented. In some countries, the rate of lending growth in foreign currency was already being outpaced by lending in domestic currency before the implementation of macroprudentialmeasures, perhaps in anticipation of such measures (for example, in Poland in July 2006 and June 2012; and in Romania in August 2008).

Figure 5: Rate of Foreign Denominated Loans before and after Macrostabilisation Policies
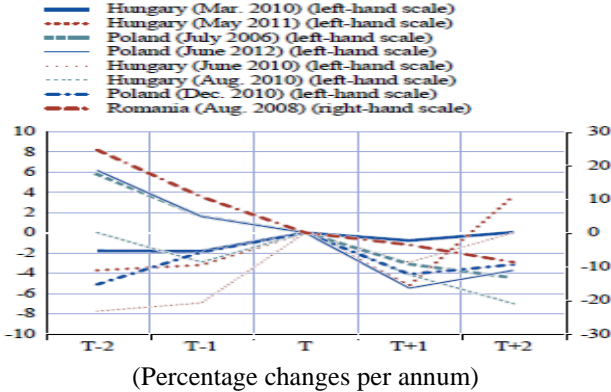
(Percentage changes per annum)
Notes: "T" is the time when a macro-prudential policy measure was implemented
Source: Kok et al. (2014)

4. Conclusions

In CEE countries, the correlation between the GDP and was different according to the ability of their respective economies to absorb loans effectively. The findings of the paper are consistent with the literature, since the amplitude and length of the cycles in the considered CEE countries depend on their financial, monetary and real economic regimes: the stabler the policies, the smoother the shape of the cycle.

It is proven that speculative lending, based on speculative expectations according to which asset prices continue to rise beyond their real value, can not be maintained forever.Therefore, when the asset prices growth stagnates, borrowers and lenders realize that they have not enough liquidity to reimburseloans that eventually leads to a loss of confidence and to credit crunch.The CEE emerging economies were deeply affected, albeit at a different scale, by the recent crises. Fuelled by overoptimism during 2000- 2008, real estate prices highly contributed to the developement of the economic and financial cycles inducing risky lending. Subject to bounded rationality, borrowers were inclined towards foreign currency denominated loans that later, once the GDP started to fall, proved to bear a high foreign exchange risk component, making reimbursements even more difficult. Since banks were eager to meet the high demand of credit, tensions accumulated in the banking system, once the rate of lending surpassed the GDP.

The paper also stresses the importance of countercyclical macroprudential measures to prevent unsustainable lending and bubbles, countries recording a decrease of risky lending after the breaking point induced by regulations. Nevertheless, the considered countries, except Czech Republic where countercyclical measures were taken, preferred direct regulatory measures that undoubtedly have only a short term effect. Considering the present evolution of markets (low interest rates, sluggish recovery, volatile markets, low investing incentive in the real economy and entrepreneurial initiatives, the dangers induced by the liquidity trap, etc), the increased attention that is presently granted to macroprudential policies is based rather on past experience, the actual state of the European economy inducing limitations in verifying the actual effectiveness of these policies.

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