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Oğuz Esen and Ayla Oğuş Binatlı

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Gordon Hall
418 North Pleasant Street
Amherst, MA 01002

Phone: 413.545.6355
Fax: 413.577.0261
peri@econs.umass.edu
www.peri.umass.edu



The Minsky perspective on macroprudential policy

Oğuz Esen, İzmir University of Economics
Ayla Oğuş Binatlı, İzmir University of Economics

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Abstract

The recent global financial crisis has underlined the need to go beyond the microprudential perspective to financial instability and move in a macroprudential direction. There is a growing consensus among policymakers and academics that macroprudential policy should be adopted. Through these changes, policymakers appear to be moving in a direction broadly consistent with Minsky's view. The theoretical framework of macroprudential policy can be found in Minsky's financial instability theory. Emerging economies, including Turkey, have adopted macroprudential tools to prevent and mitigate system wide risks. This paper offers a Minsky perspective on macroprudential policy and evaluates macroprudential tools through an examination of the Turkish experience as a case study

Key Words: Macroprudential policy, Minsky

JEL Classification:

1. Introduction

The global turmoil sparked by the sub-prime mortgage crisis in the US brought financial stability to the forefront of political and academic discussion. By 2012, there was growing consensus among policymakers that macroprudential policies should be adopted.

Macroprudential policies referred broadly to policies aiming to maintain financial stability, or more narrowly as policies aimed at mitigating systemic financial risks, the objective being the financial stability of the overall financial system, but not necessarily that of individual institutions.

Monetary policy generally pursues price stability and economic growth. Macroprudential policies aim for financial stability, which serves to promote stable economic growth. In contrast, microprudential policies target financial soundness of individual institutions, with the belief that this will lead to stability. The understanding in the era of the great recession is that stability of the entire financial system is more important than the soundness of its individual components (Clement, 2010; Schoenmaker and Wierds, 2011) and what might be considered prudent behavior from the point of view of a single institution may create broad problems when all institutions engage in similar behavior (Jacome and Nier 2012). Thus individually sound institutions do not guarantee overall stability. Persaud (2009) has expressed concern that the existing framework of financial regulation is insufficiently macroprudential, and that the excessive emphasis on microprudential policies can serve to exacerbate macro risks in the economy. Microprudential policy can also create the problem of the fallacy of composition, whereby the microprudential action of individual banks can cause systemic risk (Schoenmaker and Wierds, 2011).

The macroprudential and microprudential approaches also differ in the models used for analysis. The microprudential models are partial equilibrium in nature as opposed to the general equilibrium models of macroprudential approach. (Hanson, Kashyap and Stein, 2011) In the partial equilibrium framework, risks are assumed to be exogenous, whereas, in the general equilibrium framework they are endogenous (Borio, 2003). Risks in turn have both a time and a cross-section dimension. The time dimension reflects cumulative amplifying mechanism that operates within the financial system, as well as between the financial system and the real economy. On the other hand, the cross-section dimension reflects the distribution of risk in the financial system. (IMF 2011)

The notion of time and cross section of risk is closely related to Minsky's financial instability hypothesis, which argues that the financial attributes essential to the capitalist system are also a source of financial instability. In the aftermath of the global financial crisis, several financial stability committees have emerged worldwide. A number of countries are reassessing their institutional frameworks for financial stability, which involves reconsidering the boundaries between central banks and other financial regulatory agencies (Nier 2011). The IMF (2012) argues that central banks should play an important role in implementing macroprudential policy, given the central banks' risk management capability and motivation, and further argues that the central bank should be in a position to coordinate the policies and the regulations that affect the credit market with monetary policy.

In this respect, it is possible to identify two broad models which differ in the institutional integration between central bank and supervisory agencies. The first involves full integration of essentially all financial regulatory and supervisory functions within the structure of the central bank. In contrast, in the second model, all these functions are located outside the central bank. Arguments that are commonly presented in favor of separation refer to the

potential conflict between supervision and monetary policy. One argument is that supervisory concern about fragility of the banking system may lead central bank to pursue a more accommodating policy than warranted for the pursuance of price stability. Any explicit consideration of financial instability by central bank would only destabilize the economy because of moral hazard (ECB, 2011). Then again, the conflict between the monetary and regulatory arms of a monetary authority may not focus on different objectives, but rather on differing models of how the economic system works. Finally, a general point is that the cyclical effects of micro-regulatory and macro-monetary policy tend to conflict. Monetary policy is considered to be countercyclical, while the effects of regulation tend to be procyclical (Goodhart and Schoenmaker, 1993). There are two concerns at this point, firstly whether a combination of monetary and regulatory functions under one roof leads to conflicts of interest, and secondly whether concerns for micro level health and stability of banking system might distort of a central bank's conduct of monetary policy. Another case for separation is the central banks' increased involvement in supervisory activities as a result of the changing structure of the financial system.

The second model involves full integration within the central bank of essentially all financial regulatory and supervisory functions which the central bank is given to safeguard financial stability. As a result, the central bank also becomes owner of macroprudential policy. There are three arguments for unification or integration. Firstly, coordination across objectives and function -monetary policy, micro and macro prudential policies-takes place within a single organization. This can increase the effectiveness of decision making. Information-related synergies also occur between regulation and core central banking functions. Central bank access to prudential information is essential for the conduct of macroprudential monitoring. The second argument is that central bank must be concerned with the efficient working of payment systems, therefore it follows that central bank must also supervise and regulate at

least the main money market commercial banks (Goodhart and Schoenmaker, 1993). This position holds that whichever institution might be formally responsible for regulation and supervision, there is no alternative to the central bank as a lender of last resort, a provider of immediate extra liquidity. The final argument for combining the functions of monetary and supervisory management within the central bank is the central bank's concern for systemic stability of the financial system (Goodhart and Schoenmaker, 1995). In addition, moral suasion and discount window are declining in importance as interest rate changes are increasingly determined and managed through open market operations, so the control the central bank can currently exert on the financial institutions is only partial (Goodhart and Schoenmaker, 1995).

Nier et al. (2011) argue that different models were adopted in advanced economies and emerging economies after the global crisis. They conclude that the central bank should play an important role in macroprudential policy so as to assure coordination with other central banking functions, including monetary policy, provision of liquidity and payment system oversight. They are also of the opinion that fragmented regulatory and supervisory structures would increase the difficulty in identifying and mitigating system-wide risk.

Minsky emphasized that “while there are political and organizational, competence and historical reasons for separating Federal System and FDIC, there is clearly no economic rationale for the separation” (Minsky, 2008). Moreover, he favored the closer integration of FDIC and other financial regulatory institutions with the central bank than currently exists, and advocated a unified financial system supervisory agency.

In the next section we summarize Minsky's financial instability hypothesis and views on regulation. In section 3, we present a review of the literature on the tools used for macro prudential policy. In section 4, we discuss the extent to which macro prudential policies and tools have been implemented during the current global crisis. The last section concludes.

2. Minsky on Macroprudential Policy

A. Financial Instability Hypothesis

The economic theoretical underpinning of macro prudential policy is the financial instability hypothesis of Minsky, which takes as its starting point an economy characterized by expensive capitalist assets and a sophisticated financial system (Minsky, 1992). This view holds that business cycles, that involve threats and realizations of financial crises, turn out to be an inherent characteristic of a modern capitalist economy, due to the endogenous destabilizing forces, stemming from the sophisticated financial system.

The fundamental proposition of the financial instability hypothesis is that the capitalist market mechanism cannot lead to sustained stable full-employment equilibrium. Severe business cycles result from the financial attributes essential to the capitalist system.

In a capitalist economy, the past, present and future are linked by financial relations. The key financial relationship links the creation and the ownership of capital assets to the structure of financial relations, and the changes in this structure. In spite of sophisticated financial relations, the profit level remains the key determinant of system behavior. As expectations of profits depend upon investment in the future, and realized profits are determined by investment, then whether or not liabilities are validated depends upon investment (Minsky, 1992).

The basic characteristic of the capitalist economy is the existence of two sets of prices, those of current output and capital assets. These prices are linked because investment output is an integral part of the current output.

Minsky argues that financial instability hypothesis is a theory of the impact of debt on system behavior, and also incorporates the manner in which debt is validated:

“[T]he normal functioning of a modern capitalist economy depends on capital income (and investment) reaching and sustaining of a level at which capital assets earn sufficient income to validate past debts. If this situation does not prevail, the prices of capital assets and debt fall, and such a decline adversely affects investment demand” (Minsky, 2008).

A well known key feature of Minsky’s model is the distinction between three different types of finance: hedge, speculative and Ponzi finance. Any economic unit, whether a household, firm or financial investor, can operate as a hedge, speculative or Ponzi investor/borrower, and switch from one type to the other according to the credit and macroeconomic conditions of the economy. The economic unit is defined as “hedge” when its operating income and cash flow are sufficient to cover its contractual payment obligations. The speculative unit, on the other hand, can service only interest payments and rolls over its liabilities, while the operating income of a “Ponzi unit” covers neither the repayment of principle nor interest due to outstanding debts arising from cash flows from operations. Such units must either sell assets or borrow.

Minsky argued that the capitalist economy could be either an “equilibrium-seeking” or “deviation amplifying” system, depending on the dominant type of finance. The economy

tends to move closer to an equilibrium-seeking system as the weight of hedge financing increases. Hedge units with low leverage, high equity, low maturity mismatch are relatively independent of financial markets. In contrast, speculative and Ponzi units are highly vulnerable to changes in financial market conditions, and more exposed to default, which can in turn cause a deterioration in financial market conditions. Adverse developments in financial market can transform a speculative unit into a Ponzi unit. Hence, an economy populated with many speculative and Ponzi units not only suffers more shocks generated by the financial system, but also generates more defaults that feed back into this system. Minsky draws two theorems from his financial instability hypothesis. The first stipulates that the economy is stable under some financial regimes and unstable under others. Second, over periods of prolonged prosperity, the economy moves from financial relations that make for a stable system to financial relations that make for an unstable system (Minsky, 1992)

A second element of the model is the role of credit expansion. Supply of credit is highly procyclical, increasing during economic booms, and contracting during slowdowns. This can be due to various concomitant factors: booms are generally associated with more optimistic expectations, which lead to higher borrowing and investment in riskier assets, causing surges in investment, consumption, profit and growth rates. The same economic climate fosters financial innovation and easing of credit standards

Minsky argued that capital assets are valuable because they yield profits/cash flows, not because they are not productive. Both capital assets and financial assets should be regarded as annuities; real assets and financial assets are similar in that they both yield cash flows. Thus, when all economic activity and financial instruments are considered as yielding cash flows the real and financial aspects of a capitalist economy can be integrated.

Financial instability hypothesis considers banking primarily as a profit-seeking activity. Like all entrepreneurs, bankers are aware that innovation assures profits, but bank viability depends upon the normal and proper functioning of financial markets.

B. Minsky on Regulation and Governance

As shown, Minsky frequently argued that a capitalist economy is inherently flawed because its investment and financing processes introduce endogenous destabilizing forces. Normal functioning of the economy leads to financial trauma and crises, inflation, unemployment and poverty, in other words, the financially complex nature of capitalism means that it is inherently flawed. Fragility provides the fertile ground for financial instability, leading to a process of debt deflation and full-blown crises.

Minsky argued that the two policy instruments of big government capitalism have been extremely effective in preventing the recurrence of depressions. These are government deficit spending and lender of last resort interventions by the Federal Reserve. In a Big Government capitalist economy with an activist central bank, debt deflations and deep depressions can be contained. Minsky argued that the effect of deficit spending during a downturn is to establish a floor for profits. Running deficits in the initial phases of a downturn encourage risk taking in investment, which should in turn reverse the downturn. At the same time, lender of last resort interventions are able to counteract the liquidity shortages of distressed financial institutions. Big government with deficit and the central bank as a lender of last resort stabilizes not only employment and income but also business cash flows (profits), and thus asset values.

In this general comprehensive framework, Minsky argued that “there is a need for unified financial system supervisory agency. Ever since the financial system has evolved away from dominance by banks there is a need for an agency that can look at the financial system in a unified and coherent way”(Minsky, 1994).

Minsky believed that central banks are institutions that are able to contain and offset financial instability, and therefore have a responsibility to prevent it. If business and banking practices can lead to a fragile financing structure, the central bank has a responsibility to operate to induce banks to hedge finance (Minsky, 2008). He argued that central banks were organized to control instability and take the initiative in preventing the development of practices conducive to financial instability. Central banking should exert a stabilizing influence on the changing structure of financial relations in order to “guide the evolution of financial institutions by favoring stability enhancing, and discouraging instability-augmenting institutions and practices.” (Minsky, 2008, p.349). He believed that the reason central banking exists is because of Ponzi and speculative financing. He added that as bankers pursue profits they change the composition of their assets and liabilities, driving the interactions between bankers and their borrowing customers during the upswing, and increasing the weight of assets which reflect speculative and Ponzi finance in balance sheet of banks. “As a result, the financial system evolves from robust toward fragility continuous control and periodic reform of the banking system are needed to prevent the development of a financially unstable economy that can’t readily be contained” (Minsky, 2008).

Minsky strongly supported expanding the role of the central bank in the overseeing of banks by shifting to the use of discount reserves provision. He argued that most reserves supplied by central bank come through open market operations. This greatly restricts the central bank’s ability to determine which collateral to accept, and to carefully examine the balance sheets of

borrower, thus limiting its ability to ensure the safety and soundness of the system. Minsky takes exception to the fact that information regarding the credibility of the banks and their customers was considered important a hundred years ago when such information was difficult to obtain, but is considered of no consequence in this age of information (Minsky, 1994). In sum, central banks should reduce their reliance upon open market operations when determining the reserves of the banking system.

Minsky argued that financial reform can be effective only as part of general system of reform, stating: “The emphasis on investment and economic growth rather than on employment as a policy objective is a mistake” (Minsky, 2008, p.325). Greater emphasis on investment generates increased layering of financial commitments and higher profit that reward unnecessary innovation, leading to greater risk taking and producing a more fragile financial structure. He believed that the dangerous instability in a capitalist economy is most pronounced when moving towards a boom. That is what makes a debt deflation possible as asset prices become overvalued and much debt is issued.

3. Macroprudential Policy: Tools and Effectiveness

Federico et al. (2012) discuss the different kinds of macroprudential tools that can be used for macroeconomic policy, such as caps on the loan-to-value (LTV) ratio, caps on foreign currency lending, limits on mismatch, counter cyclical capital requirements, reserve requirements and the re-fashionable Tobin tax. They classify these tools into three categories, namely credit-related, liquidity-related and capital-related. The Lim et al. (2011) survey of the use macroprudential tools used, especially in the aftermath of the global crisis, shows a greater use of such tools by emerging economies compared to more advanced economies, both before and after the crisis. A summary of their analysis is given in Table 1. Reserve

requirements were the most often used tool for macro prudential purposes in the emerging economies in this period. Reserve requirements were increased in China, India, Indonesia and Brazil, and differentiated in Chile and Peru. In most of these countries, increases in reserve requirements were complemented by additional measures, the LTV ratio being the seemingly preferred choice. India and Chile introduced maximum LTV ratios, China imposed a lending ceiling, while Brazil increased capital requirements for loans with high LTVs. Lim et al. (2011) also argue that the type of shock is an important potential influence on line choice of instruments, and note that some countries have used macro prudential instruments to address credit growth resulting from capital inflows. They give the example of Korea, which imposed limits on foreign exchange loans, introduced a ceiling on bank's forward position and reintroduced a withholding tax on foreign purchases of Treasury bond. Lim et al. (2011) broadly conclude that macro prudential instruments seem to have been effective in reducing the correlation between credit and GDP growth. Moreover, effectiveness does not seem to depend on the stage of economic development or the type of exchange rate regime.

Calderon et al. (2011) review macroprudential policy as it applies to Latin America Countries (LACs). They characterize financial cycles, drawing on quarterly information for 79 Latin American countries for the period 1970-2010. Using time series techniques to date peaks and troughs, as well as identify booms and busts, they found LAC's financial cycles have become shorter and more frequent, and more pronounced. Credit cycles in Latin American countries have tended to precede output cycles and follow asset cycles, and financial cycles have often ended in crisis. The scale of the boom is a significant predictor of the occurrence of crises, with bigger booms more likely to result in crises. They concluded that there is a particularly strong case for macroprudential policy in the region, but there is much uncertainty as to the effectiveness of current macroprudential tools.

Tovar et al. (2012) analyzed the role and effectiveness of macroprudential tools in a cross-section of Latin American countries in the aftermath of the global financial crisis, where the use of macroprudential tools was evident both before and after the financial crisis. In order to assess the impact of macroprudential tools on bank credit into the private sector, they use data from Brazil, Chile, Colombia, Mexico and Peru over the period January to April 2011, conclude that the employment of macroprudential tools has an only modest and transitory effect on the growth of credit in the private sector. Countries introduced macroprudential policies in times of credit growth expansion and acceleration, which had an immediate, but moderate effect on the growth of bank credit to the private sector in the following month. The effect was only temporary, however, and disappeared after four months.

Hanson, Kasyhap and Stein (2011) argue that the basic weakness of micro prudential regulation is that when troubled banks are forced to restore capital ratios, the regulator does not take into consideration whether the bank adjusts via raising new capital or shrinking assets. The macroprudential approach to financial regulation, as an effort to control social costs is associated with excessive balance sheet shrinkage on financial institutions and economy. These researchers consider that generalized asset shrinkages have two primary costs: credit crunch and fire-sale assets. Financial institutions have strong incentives to shrink assets rather than recapitalize once a crisis is underway, and to operate with their capital buffers before a crisis occurs. The macroprudential approach aims to counterbalance these two tendencies. Hanson, Kasyhap and Stein (2011) argue that when a bank suffers a capital-depleting shock, it has two options that allow it to avoid shrinking its assets. It can raise new capital, or alternatively it can let its ratio of capital assets declines. They discuss the effect of alternative macroprudential tools, such as time-varying capital requirement, higher-quality

capital, corrective creation targeted at dollars of capital, contingent capital, regulation of debt maturity.

Table 1: Recent Macroprudential Measures in Emerging Economies

Brazil (2008-2010)	<ul style="list-style-type: none"> • RRs were raised to reduce credit growth • CB increased capital requirement for some consumer loans with long maturities and high LTV
Bolivia (2008)	<ul style="list-style-type: none"> • Time/dynamic provision
Chile (2008-2009)	<ul style="list-style-type: none"> • Differentiated reserve requirements • Max. LTV ratio for
China (2010, 2011)	<ul style="list-style-type: none"> • Lending ceiling • Reserve requirements have been increased 8 times since January 2010 • Countercycal requirement: large banks were required to have countercyclical and systemic capital buffer • provision
Korea (2009-2011)	<ul style="list-style-type: none"> • introduction of a ceiling on bank's FX forward position • limits set on FX loans • reintroduction of a withholding tax on foreign purchases of Treasury and money stabilization bonds
India (2004-2010)	<ul style="list-style-type: none"> • LTV: introduction of LTV of 80 % • Reserve requirement: increase in cash reserve requirements from 4.5 to 5, 5.5 and then 6 % • Risk weight: increase in risk weight on housing loans from 50 % to 75 % • Provision: increase in general provision from 0.25 % to 40 %
Indonesia (2010-2011)	<ul style="list-style-type: none"> • Reserve requirements: reserve requirement for local currency deposit was raised from 5 to 8 for FX deposits 1 to 5 and 8%.
Malaysia (2010)	<ul style="list-style-type: none"> • Introduction of 70% LTV for third house
Peru (2008-2011)	<ul style="list-style-type: none"> • Differentiated reserve requirements • Time-varying/dynamic provisioning

Source: Lim et al. (2011)

4. Macro prudential policy in Turkey

Immediately following the severe economic crisis of 2001, the central bank law was amended giving the central bank the primary mandate of achieving and maintaining price stability. In 1999, the Banking Regulation and Supervision Agency (BRSA) was established which targeted financial stability of individual institutions, however, with no regard for overall stability. The Central Bank of Turkey (CBRT) adopted an inflation targeting regime starting

in 2005 as the framework of monetary policy, whereby the main tool used, the policy rate, is tied to expectations on the future path of inflation.

Before the recent global crisis, the dominant view had been that price stability alone was enough to ensure financial stability. Although monetary authorities were aware that financial disruptions could have a serious negative impact on the economy, they regarded monetary and financial stability as a dichotomy, in which these two types of policies would be conducted in isolation from each other. Since 2009, this view has been regarded with growing skepticism as it has become evident that financial imbalances could build up in a non-inflationary environment. In itself, monetary policy, as it is targeted to price stability, may not be sufficiently effective in preventing or managing a financial crisis.

The new approach is summarized in a CBRT report as follows: ‘financial stability is one of the prerequisites for price stability’. Under the present inflation targeting framework, macroprudential policy has been presented as a tool to achieve financial stability and control credit fluctuations. In its report, CBRT states that:

“[I]n order to contain macro-financial risks driven by global imbalances, the Central Bank enhanced the inflation targeting regime and designed a new monetary policy strategy. Accordingly, the Central Bank started to take macro-financial stability into account as much as economic conditions permit while preserving the primary objective of maintaining price stability. Within the framework of this new structure, the Central Bank designed a policy mix in which the interest rate corridor, which is formed between the overnight borrowing and lending rates, and required reserves are jointly employed besides the policy rate to ensure the diversity of instruments that is required by the monetary policy implemented to achieve multiple goals” (CBRT, 2011, p.2).

During this period, the availability of ample and low cost short-term foreign financing led to a rapid growth of credit, and appreciation pressure on the Turkish Lira. This resulted in the accumulation of macro financial risks and rising external imbalances as of the second half of 2010. As escalating risks pertaining to financial stability have the potential to hamper stability over the medium term, academic and policy circles began to discuss the desirability of incorporating financial stability into monetary policy framework.

In order to contain macro financial risks in the domestic economy generated by global imbalances, at the end of 2010, the CBRT designed and launched a new policy strategy with the objective of containing financial instability. In this context, in addition to the policy rate, complementing tools, such as required reserve ratios and the interest rate corridor were also used to cope with financial imbalance.

In the period between November 2010 and August 2011, the new policy strategy was shaped around two axes. First, channeling capital inflow towards long-term investments and preventing over-appreciation of Turkish Lira was targeted. The second goal was greater control over domestic loans and domestic demand, which rebalanced domestic and external demand (Başçı, 2012). Required reserve ratios were increased six times between November 2010 and October 2011, creating a significant rise aimed at controlling domestic demand. Reserve requirements were also differentiated by maturities. CBRT terminated the practice of charging interest on reserve accounts, a policy change supported by BRSA's decisions concerning general and special provisions in May and June 2011 (BRSA, 2012). The above actions of the CBRT had the following objectives: limiting short term capital flows, preventing excessive appreciation of the lira, balancing the divergence between external and domestic demand, and controlling the growth of domestic credit and demand.

In spite of reserve requirements' long history in Turkey, they did not become an effective tool until 1985. Three explanations can be offered for this. Firstly, numerous exceptions were applicable on a significant portion of the deposits; secondly reserves which were supposed to be blocked were partially returned to the system; and finally there were delays in coming up with reserves. In 1985, the system was restructured with the purpose of making the reserve requirement a powerful and flexible instrument of monetary policy. The preferential ratios applicable to deposits channeled to export and investment credits were abolished. The period allowed to provide the reserves was shortened from 12 to 6 weeks. The ratio was to be reduced gradually. In 1996, the application of the reserve requirement was simplified and liabilities subject to reserve requirements were divided into three categories: Turkish Lira deposits, foreign exchange deposits and gold deposit accounts. However, interbank deposits of domestic banks, and treasury current accounts were to be exempt from reserve requirements (Keyder, 2002).

Figures 1 and 2 show the movement of the reserve requirement weighted by the share in credit with domestic credit growth and spread respectively. Credit growth averaged 2.25% until October 2008, when credit growth remained stagnant for the next nine months. Credit growth started to pick up in June 2009 and averaged 2.4% for the next year but the increasing trend in credit growth rate is quite apparent. Reserve requirement rates were increased in October and November 2010. Further increases, resulting from differentiation of the reserve requirement in January 2011, ensued and the reserve requirement weighted by credit reached 9.18 % in February 2011 and 12.71% in April 2011. However, credit growth started to exhibit a declining trend once more later in 2011.

The impact of the increases in the reserve requirement on the spread are more pronounced. In 2011, increases and declines in the reserve requirement lead to changes of a similar

magnitude on the spread, in contrast to the continuously declining trend over the previous two years.

Figure 1: Credit growth (blue line) and required reserve ratio (red line)

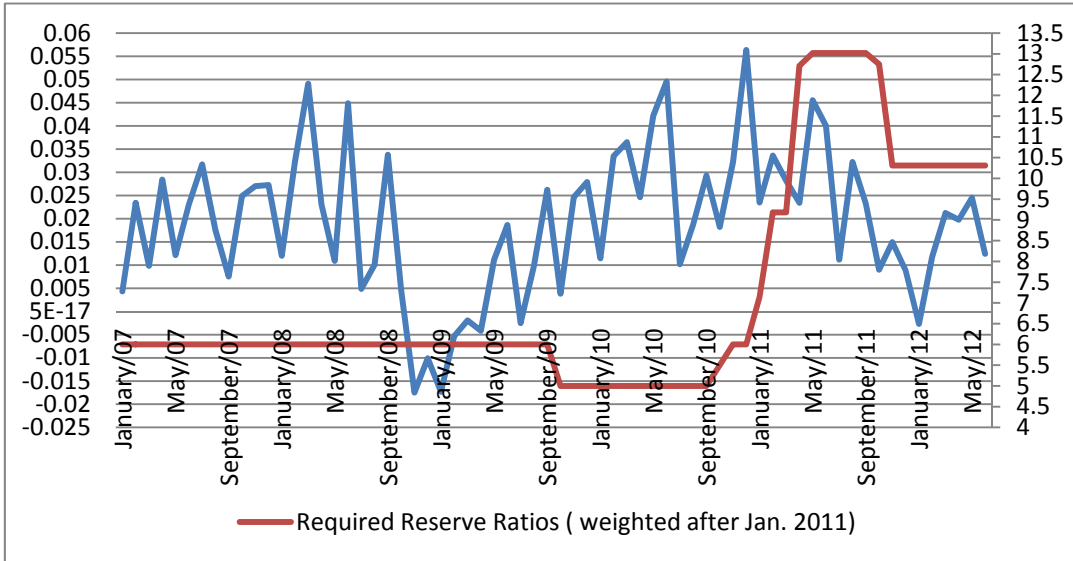


Figure 2: Spread and required reserve ratio

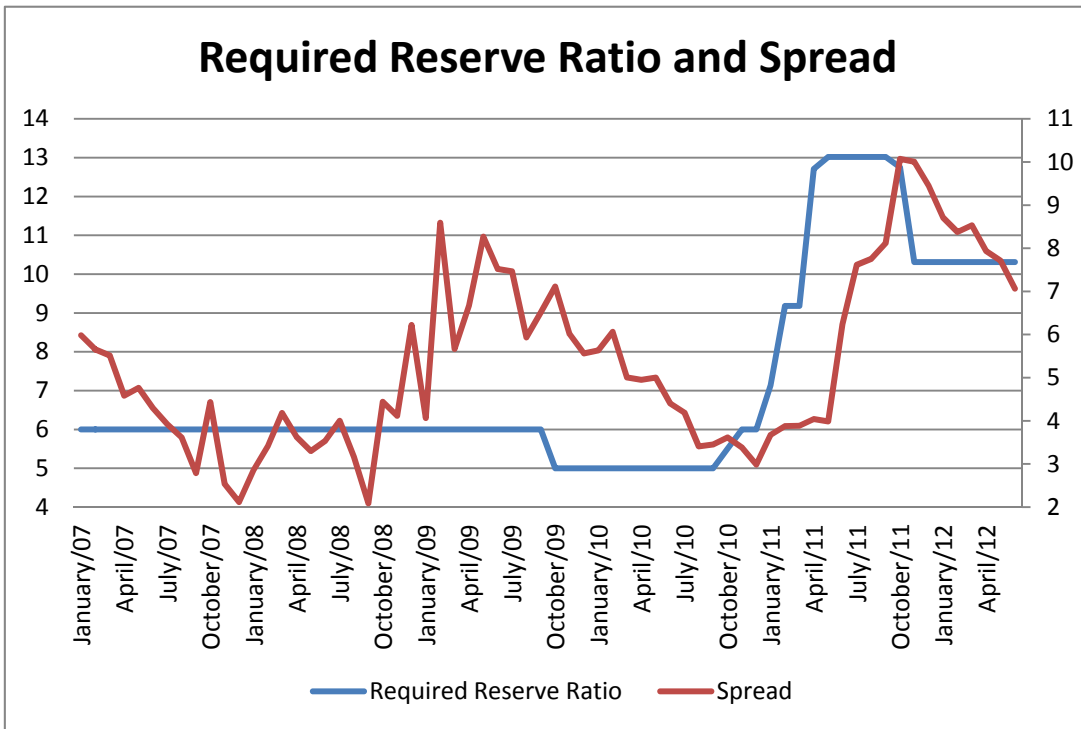
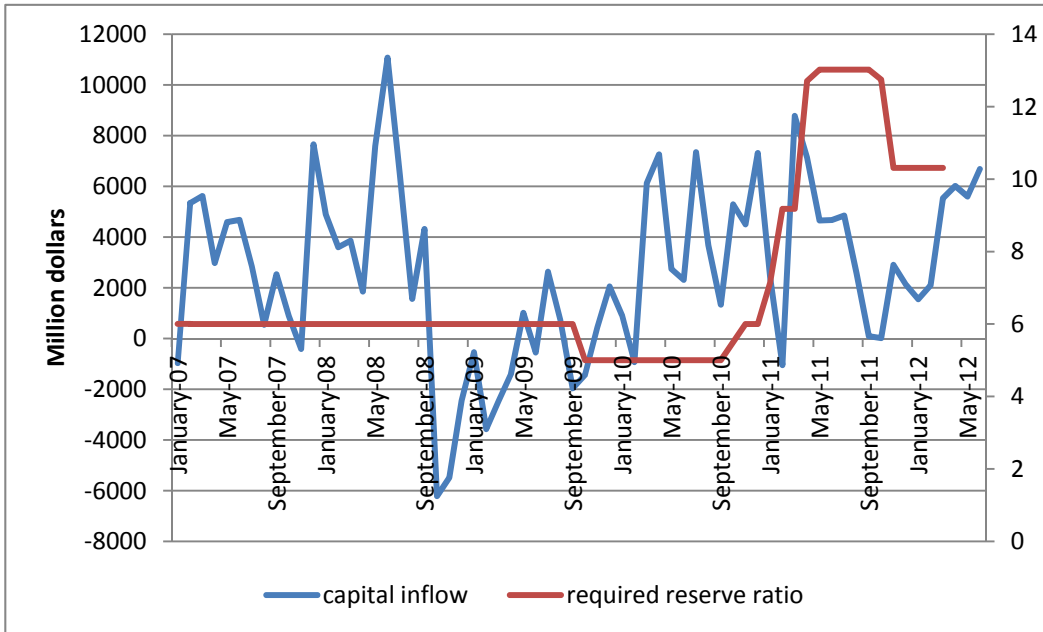


Figure 3: Capital Inflows



Notes: Capital inflow is the sum of portfolio inflows and other investment inflow.

Figure 3 presents capital inflows in the same period. Capital inflows have been quite volatile and exhibited sharp reductions with the onset of the financial crisis in the summer of 2008. In 2011, capital inflow has slowed down until September 2011 and started to pick up again following the reduction in the weighted reserve requirement from 13.02% in September 2011 to 10.31 % in November 2011.

A visual inspection of domestic credit growth, the spread and capital inflows suggest that the use of the reserve requirement as a macroprudential tool had a positive, although limited, effect. Another of the banking sector's responses to increases in reserve requirements was to increase funds provided by foreign banks. The share of loans from foreign banks in total liabilities rose from 11 % in 2010 to 16 % in 2011. The increase in the reserve requirement, needed to induce the desired effect, was large. If a coordinated policy to restrict banks from bringing in foreign sources of credit had been put in place, a more modest increase in the

reserve requirement may have dampened credit growth. In addition, increasing the cost of borrowing would inevitably lead to the financing of projects and funding of loans involving higher risk levels, which are not desirable outcomes of macroprudential policy.

The response of the Turkish banking sector to the action of central bank validates Minsky's statement that "(t)he standard analysis of banking has led to a game that is played by central banks and profit seeking banks. In this game, authorities impose interest rates and reserve regulations...banks invent and innovate in order to circumvent the authorities. ...Profit-seeking bankers always win their game" (Minsky, 2008, p. 279)

Although the CBRT was successful in slowing down the growth of domestic credit by increasing the reserve requirement, the magnitude of the necessary increase was very large, from 8 % to 16 percent in a few months for small time deposits. We argue that the effectiveness of monetary policy was undermined because the CBRT is not the sole regulatory and supervisory agency. The goal of increasing the reserve requirements was to reduce domestic credit growth, at the same time avoiding raising interest rates, which would have increased capital inflow. The CBRT would have achieved this goal if it had been able to prevent banks from borrowing internationally when it raised the reserve requirements. If this had been the case, the growth of domestic credit would have slowed more rapidly, producing a less pronounced increase in the reserve requirement, and avoiding capital inflow.

We investigate whether the required reserve ratio was an effective macroprudential tool over the last decade. We regress domestic credit, capital inflow and the spread on the required reserve ratio and other relevant variables to test the significance and the direction of the required reserve ratio on macroeconomic indicators. Equation (1) estimates the effect of required reserve ratio on domestic credit, in a demand equation for credit. Domestic credit,

GDP and the policy rate are in logs. All the variables are found to be nonstationary and integrated of order 1 (See Table A in Appendix) so this equation can be regarded as a cointegrating equation, given the stationarity of the residuals. There is a positive relationship between income and credit, and a negative relationship between the interest rate and credit as predicted by economic theory. There is a positive relationship between the reserve requirement and domestic credit, indicating that these factors move together. This suggests that the Turkish central bank also increases the reserve requirement when credit is booming and accelerating, as Tovar et al. (2012) have found for Latin American countries.

Table 2. Regression Results

	Equation (1) Domestic credit	Equation (2) Capital inflow ^a	Equation (3) Spread
RR	0.0699*** (0.0160)	643.1282 (574.5991)	0.04074* (0.0230)
GDP	2.0263*** (0.2899)		
Exchange rate		-1145.0575 (4941.767)	
Policy rate	-0.0413*** (0.0033)		-0.0906 (0.0831)
Unit root test on residuals (PP)	-2.9786***		-5.5185***

^aThe independent variables are in differences.

Capital inflow is found to be stationary, so we regress it on reserve requirement and the exchange rate in first differences. We find no significant immediate effect of changes in either the reserve requirement or the exchange rate on capital inflow.

Equation (3) investigates the relationship between the reserve requirement and the spread. As expected, there is a positive relationship, and increases in the reserve requirement are

associated with an increased spread. Glocker and Towbin (2012) argue that reserve requirement acts as an implicit tax on the banking sector, causing a widening of the spread between the deposit and lending rates. The higher spread reduces the attractiveness of lending to domestic banks for investors and increases the cost of borrowing from the banking sector for the domestic sector. This argument implies that increases may lead to a contraction in domestic credit, without attracting capital inflows and causing currency appreciation. They concluded that increases in both interest rates and reserve requirements lead to a contraction in domestic credit. In Turkey, we found that increase in interest rates lead to a contraction in domestic credit, supporting Glocker and Towbin's (2012) findings. However, our findings on the effect of the reserve requirement on domestic credit do not indicate a contractionary effect for the entire sample period.

5. Conclusion

The macroprudential approach in regulation is largely an expression of Minsky's view. Central banks should play an important role in macroprudential policymaking. A macroprudential approach to financial stability presupposes, sometimes explicitly and at other times implicitly, Minsky's hypothesis that financial markets are inherently unstable and contain amplifying mechanisms. In other words, after the financial crisis Minsky's approach has been accepted both by policymakers and the academia. The diagnosis of the problem is the starting point for the solution and the cure. The debate regarding the responsibility for conducting macroprudential policy tends to favor the central bank, in parallel with Minsky's ideas. When given the objective to ensure financial stability, the central bank becomes the owner of macroprudential policy and the macroprudential decision maker. Thus, all financial regulatory institutions should be more clearly integrated within the central bank. The existing structure is to strip central banks of some of their responsibilities for the regulation and oversight financial institutions. Existing

macroprudential policies mostly emphasize the liability side of commercial banks. However, macroprudential policy should allow central banks to have oversight of banks' activity, particularly emphasizing the asset side of the balance sheet. As Minsky stressed, the emphasis on the discount window allows central banks the right to access information about the balance sheet, income and competence of their clients and bank management.

Turkey represents an important case study of the adoption of macroprudential tools for monetary policy in the aftermath of the global financial crisis. The main objective of the Turkish Central Bank has shifted in recent years from price stability to financial stability and the reserve requirement has been the most important tool of macroprudential policy to financial stability in Turkey. The reserve requirement has been actively employed to combat domestic credit growth without leading to capital inflow. Even though the growth of credit slowed down, the increase in the reserve requirement to induce the necessary response was too high.

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Appendix: Unit Root Tests

	Augmented Dickey Fuller (ADF)			Phillips - Perron			KPSS	
	Intercept	Trend & Intercept	None	Intercept	Trend & Intercept	None	Intercept	Trend & Intercept
<i>Capital Flow</i>	-6.2865*** (0)	-6.5341*** (0)	-2.1967** (2)	6.3794*** (4)	-6.6475*** (4)	-4.3668*** (5)	0.263142 (7)	0.096228 (7)
<i>Domestic Credit</i>	1.784312 (7)	-0.416507 (7)	2.415965 (7)	4.422087 (7)	0.46295 (7)	8.453143 (7)	1.233109 (9)	0.257309 * (9)
Δ <i>Domestic Credit</i>	-1.953616 (6)	-2.889298 (6)	-0.877235 (6)	-5.53121 * (5)	-7.306067 * (5)	-3.237467 * (3)	0.813464 * (8)	0.115916 (7)
<i>GDP</i>	-0.838852 (10)	-1.767197 (10)	2.298894 (10)	-2.576051 (6)	-5.091522 * (5)	0.332521 (5)	1.156357 * (9)	0.116655 * (6)
Δ <i>GDP</i>	-7.385645 * (10)	-7.370358 * (10)	-5.483132 * (10)	-11.73246 * (4)	-11.68333 * (4)	-11.7337 * (4)	0.020512 (5)	0.016636 (5)
<i>Policy Rate</i>	-2.572961 (3)	-2.404368 (3)	-3.514748 * (1)	-2.97642 ** (6)	-1.993229 (6)	-3.76832 * (6)	1.00948 *** (9)	0.185421 * (9)
Δ <i>Policy Rate</i>	-3.747073 * (2)	-4.035135 * (2)	-3.480622 * (2)	-6.640436 * (5)	-7.047198 * (4)	-6.168624 * (5)	0.423325 (7)	0.102248 (7)
<i>Required Reserve Ratio</i>	-0.832002 (7)	-1.550131 (7)	0.551985 (7)	-1.416671 (6)	-2.022357 (6)	0.178089 (6)	0.457509 *** (9)	0.171062** (9)
Δ <i>Required Reserve Ratio</i>	-5.225041 * (6)	-5.319171 * (6)	-5.176442 * (6)	-9.769729 * (6)	-9.783195 * (6)	-9.770078 * (6)	0.100625 (6)	0.040310 (6)
<i>Spread</i>	-2.511666 (8)	-2.668362 (8)	-0.065259 (8)	-4.205585 * (6)	-4.192865 * (6)	-0.912921 (4)	0.112324 (8)	0.106474 (8)
Δ <i>Spread</i>	-5.78625 * (7)	-5.758561 * (7)	-5.767534 * (7)	-13.67203 * (2)	-13.6059 * (2)	-13.91676 * (3)	0.05109 (2)	0.033781 (1)
<i>Exchange Rate</i>	-1.905147 (3)	-2.586051 (3)	0.170034 (4)	-1.540848 (1)	-1.997611 (3)	0.273549 (4)	0.412921 *** (9)	0.24275 * (9)
Δ <i>Exchange Rate</i>	-6.022916 * (3)	-6.237423 * (3)	-6.039192 * (3)	-8.366676 * (6)	-8.484796 * (8)	-8.411894 * (6)	0.142803 (4)	0.030471 (5)

, and *** refers to rejection in 1%, 5% and 10% significance respectively*

Optimal lag lengths for ADF and optimal bandwidth for PP and KPSS tests are indicated between parenthesis.

Null hypothesis for KPSS is that dataset is stationary