“Financial crises and capital buffer: evidence from the Turkish banking sector”

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Financial crises and capital buffer: evidence from the Turkish banking sector

Abstract

Global developments following the collapse of U.S. housing and mortgage system with the triggering effect of the bankruptcy of Lehman Brothers led to an unavoidable global financial crisis. Crisis spread to other countries swiftly, thanks to globalization and securitization of the risky assets. The liquidity shortage and trust erosion among banks blocked interbank transactions. Off-balance sheet vehicles and conduits also created more burdens on bank's liquidity and capital needs. Banks made best endeavor to sell their assets to increase their liquidity but this led to the widening of the liquidity crises and spread to stock and bond markets. In local terms, following the banking and liquidity crises, especially the drastic ones in 2000-2001, Turkish banking sector has learned a lot and has developed substantial amount of precautionary and structural measures towards the crises. In this study, the authors have explored capital-buffering approach as one of the precautionary measures of Turkish banking sector during the latest global financial crises. This study has been conducted with the gathered data from 1997 to 2004 and provides insights about the Turkish banking sector's capital buffer utilization as a precautionary measure before and during the crises times. According to the first classification by bank types, the findings indicate that development and investment banks prefer highest capital buffer. State-owned deposit banks, on the other hand, are the ones with negative capital buffers in average terms. The article finds out that capital buffers in Turkish banking system has been rocketed by the 2001 restructuring program of the Turkish banking sector. When the authors exclude the banks transferred to the Savings Deposit Insurance Fund, capital buffer of the Turkish banking system was well above those of the European banking sector. The findings regarding the cyclical behavior of capital buffers in Turkish banking system, indicates that privately-owned deposit banks and large banks fluctuate pro-cyclically. Except the crises in the years of 2000 and 2001, development and investment banks are found to be pro-cyclical in their movement, as well. Likewise, total sample, excluding banks under the control of the Savings Deposit Insurance Fund, is fund to be pro-cyclical in its movement, except years 2000 and 2001. Small- and medium-sized banks move pro-cyclically except pre-crises year of 1999 and crises years. Only banks under the control of the Savings Deposit Insurance Fund are found to move counter-cyclically. Finally, total sample moves pro-cyclically except pre-crises year of 1999 and crises years of 2000 and 2001. It can be concluded with the provided evidence that the Turkish banking sector utilizes capital buffer as a precautionary measure against the financial crises.

Keywords: financial crisis, capital adequacy ratio, banking system, capital buffer, business cycles.
JEL Classification: G01, G21.

Introduction

Financial and banking crises are not uncommon but their intensity and frequency in the world of globalization is taking serious attention because of their vital consequences both in national and global scale. We used to witness global financial crises mainly generated by the developed markets. After the increased liberalization trend, emerging markets, which integrated to global markets, begin to trigger global financial crises as well. With this increased market integration, financial markets are much more vulnerable to global shocks. The latest global financial crisis began in July 2007 with the collapse of the two hedge funds of Bear Stearns. This collapse has revealed the so-called subprime mortgage crisis in a fragile financial environment of increasing mortgage delinquencies and foreclosures in the U.S., deepened, and widened in September 2008, by the bankruptcy of Lehman Brothers. The main leading factors contributed to this global financial crisis could be summarized as the global imbalances, poor risk management practices and loose financial regulations and supervisions (Kenc and Dibooglu, 2010). Turkish banking sector was successful to deal with the first shock of the global financial crises experienced, relatively much better compared to its counterparts in Europe during the crises and it was among the first group that recovered from the crisis. When we compare the performances of the banking sectors we find out that while the Turkish banking sector has experienced efficiency indicator ROE of 21.7%, 16.8% and 20.2% for the years of 2007, 2008 and 2009 respectively, it is 15%, -3% and 0,3% for the EU Banking sector respectively for the same period.

If we examine the U.S. financial system, we witness that between 1990 and mid-2000 equity prices in U.S. increased nearly five times. After the burst of the so-called dot-com bubble, the U.S. economy slowed down in 2000 and entered recession in 2001. The Federal Reserve Bank of New York reduced the interest rates drastically to fight the recession. Lower target interest rates has not only contributed to the global flow of funds but also made mortgages

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attractive to investors. With this given manipulation in the market, house prices skyrocketed as the demand for houses exploded. As Kumpan (2009) asserts, increased liquidity, loose lending standards, and low interest rates reshaped the subprime system and eventually increased risky mortgage credits by making the financial system more fragile. Taylor (2008) blames the "two easy" monetary policy decisions and the low interest rates for causing the monetary excess which in turn led to a housing boom. Innovative mortgage backed financial products and securitization has contributed to the fragility and vulnerability of the financial system by increasing risk appetite and greed of the actors of the system. Crises spread to the other countries swiftly by two channels namely the globalization and securitization. Interbank transactions have been blocked due to the trust erosion among the banks. Banks kept their assets in their balance sheets more than they intended. The stress on their capital ratios increased. Off-balance sheet investment vehicles and other conduits created further pressure on bank's liquidity and capital needs. Banks tried to increase their liquidity by selling sound assets and this led the widening of the crises to the stock and bond markets (Ackermann, 2008).

Securitization involves the bundling of residential mortgages into polls against which mortgage backed securities are issued into the public bond market. Rating agencies in U.S. do not only rate financial assets but also compete to sell advisory services to the issuers. This complex conflict of interest and intra-dependent ties among the issuers and raters has worsened the global financial crises. While the function of the credit default swaps (CDS) is to reduce the risk, as Dewatripoint et al. (2009) claims, this market also contributed to the increasing integration of the global financial markets by increasing systemic risk. On the other hand, the opacity of the credit derivate markets made it even more difficult for the regulators to prevent the global financial crisis. Rajagopalan and Zhang (2009) argue that executives and employees of the banks gained enormous share of profits while the market was booming. When the market began to decline, these banks received huge amounts under the bailout programs executed by the governments which in turn paid by the payment of taxpayers. These examples show the complexity of the magnitude of challenges waiting for the regulators and governments in the corporate governance and financial markets field. The experienced latest global financial crises showed that deposit insurance is important but not adequate to limit the risks in banking crises. In recent years, banks acted to reduce the level of bank capital relative to bank assets. Rötheli (2010) suggests that banks that finance long-term investments with short-term funds should work with high liquidity buffers.

In this study, we present major episodes and underlying reasons of the financial crises both in global and national scale and explore the utilization of the capital buffer approach as a precautionary crisis measure in the Turkish banks. Since Turkish banks have shown low risk and high performance during and after the global financial crisis, their capital management strategy will also be examined and compared. Data has been gathered from Banks Association of Turkey for the 64 Turkish banks for the period of 1997-2004. The organization of the paper is as follows. Section 1 describes the episodes of global financial crises. The financial crises in Turkey are categorized and discussed in Section 2. Section 3 explains the vital importance of capital buffer and its cyclical behavior in the Turkish banking sector. Summary and concluding remarks are presented in the final Section.

1. Episodes of global financial crises

The financial crises have been the part of banking and financial sector for hundreds of years and caused evolution of the banking system. There is a substantial literature on episodes of the financial crises, especially on the international financial crises. Kindleberger (1996), Bordo and Schwartz (1996), Bordo et al. (2001), Bordo (2003), Eichengreen (2003), Isard (2005), Reinhart and Rogoff (2009) and Dungey et al. (2010) used similar systematic comparison of the crises and divided the periods of crises into four parts: the Gold Standard Era (1880-1913), the Interwar Years (1919-1939), the Bretton Woods Period (1945-1971), the Recent Period (1973-1997). The major crises of the Gold Standard Era was the Baring crisis of 1890, resulting from the overinvestment in Latin America and the banking panic in the U.S. in 1907-1908 (Bordo and Eichengreen, 1999). Both crises have severe effects. While the Baring crisis triggered an international crisis in England and Latin America, the 1907 crisis accelerated the worst crisis of this first era and spread to Italy from England via France. Lending possibilities to Italy and other countries in the same region has been sharply cut off during this incident (Bordo and Murshid, 2000). The 1907 crisis led to the foundation of the Federal Reserve Bank of New York in 1914 but banking crises continued to occur until strong banking regulations and controls were put in practice in 1933. In many other countries, response to the crises was even stronger than in U.S. and appeared as government ownership of the banking sector (Allen, 2008). Outbreak of the World War I (1914) led to a massive capital outflow from the financial markets of U.S. to its opponents. This situation handled by some pre-

cautionary measures such as the closure of New York Stock Exchange, pooled U.S. gold reserves and issue of emergency currency to ease banking panics. Severe business cycle downturns of the interwar era (1920-1921, 1929-1933 and 1937-1938) were related with very tight money. According to White (2008), there was a real estate boom and burst in the 1920s. There was a stock market crash in 1929 and in 1930-1932. The recession period is between 1929 and 1933, which entails four banking panics. There is a collapse of bank lending (a credit crunch) in 1930-1933. In 1937, the stock market crashed and there is also a collapse of bank lending in 1937-1938 (Bordo and Haubrich, 2010). According to the findings of Bordo, this era was the worst of the all periods. This is not surprising since the Great Depression affected most countries in this period. Banking crises, in particular, were more widespread during this period than in the other periods (Allen, 2007). After the Great Depression, most countries imposed severe regulations on banks or brought them under state control to prevent them from taking too much risk and not to allow such a drastic depression to happen again. In the Bretton Woods Period (1945-1971) banking crises were almost completely eliminated. In Brazil, a twin crisis occurred in 1962, but apart from those, there were no banking crises during this entire period. There were frequent currency crises mostly occurred due to the inconsistency between macroeconomic policies and the level of the fixed exchange rates set in the Bretton Woods system (Allen, 2008). In 1951, Federal Reserve Bank of New York's independence restored and the major concern appeared as the price stability for the next 15 years (Meltzer, 2003). Tight Federal Reserve Bank of New York policy on short-term interest rates against an inflation danger disrupted the intermediation function of banking system and bank lending. Disintermediation crunches occurred in the years 1953, 1957 and 1960 (Wojnilower, 1980; 1985; 1992). An increasing amount of countries adopted floating exchange rates by the broke down of the Bretton Woods system on 1971 (Crockett, 2004; Haldane and Kruger, 2004; Dungey et al., 2010). Regulations and public ownership went too far and prevented financial system from allocating resources until financial liberalization started in the 1970s and this caused the return of crises (Allen, 2008). The effect of financial liberalization on growth and its impact on financial fragility and the propensity to crises have been examined in separate studies. Kaminsky and Reinhart (1999), Demirguc-Kunt and Detragiache (1998), Glick and Hutchinson (2001) found that the propensity to banking and currency crises increases in the aftermath of financial liberalization period. In the Recent Period (1973-1997), Federal Reserve Bank of New York continued tightening mainly to deal with the OPEC shock in 1974. Banks were urged to allocate credit through non-price rationing instead of increasing interest rates. Federal Reserve Bank of New York tightening policy coincided with the Gulf War and started recession years (Bernanke and Lown, 1991). The process of liberalization and integration of global financial markets in 1980s, accelerated as Rajan (2000) asserts after 1990. In 1996, capital inflows to the developing countries reached $190 billion, more than ten times of the average annual flow between 1984 and 1989. There were several episodes of financial turbulence in 1990s, such as the breakdown of the European Exchange Rate Mechanism in 1992-1993, the Mexican crisis in 1994-1995 spilled over into Argentina and Brazil through the so-called "Tequila effect". The East Asian crisis from mid-1997 to mid-1998 spread swiftly to a number of other regional currencies. Turkey and Ecuador experienced currency crises during the 1990s as well. After the tech-boom (dot-com bubble) in 2001, recession years have started for the U.S. Dungey et al. (2010) claims that loose monetary policies, search for yield, financial innovations, inadequate regulations and a regulatory arbitrage caused the crisis spread to the global markets and increased its destructive effect. Reinhart (2009) defines the period of 2008-2009 as a "second great contraction" with seriously declining real GDPs in several countries.

Kaminsky (2003) categorizes the financial crises models and asserts to be grouped in three generations. Financial crises since the 1970s caused evolution of a variety of theories on the causes of speculative attacks. Models are divided into three generations. The first-generation models (developed by Krugman, 1979; Flood and Garber, 1984) focused on the fiscal and monetary causes of crises. These models were mostly developed to explain the crises in Latin America in the 1960s and 1970s. The second-generation models (developed by Obstfeld, 1994; Eichengreen, Rose and Wyplosz, 1996), aim at explaining the European Monetary System crises of the early 1990s. The focus was mostly on the effects of counter-cyclical policies in mature economies and on self-fulfilling crises, with rumors unrelated to market fundamentals at the core of the crises. The Tequila crisis in 1994 and the Asian flu in 1997, fueled third-generation models, developed by (Krugman, 1999; Aghion, Bacchetta and Banarjee, 2000) which focus on moral hazard and imperfect information. The emphasis here has been on "excessive" booms and bursts in international lending and asset price bubbles.

2. Financial crises in Turkey

Turkey is one of the leading emerging markets with big potential, high growth rate, increasing industrialization trend, big opportunity in trade and foreign direct investment. Turkey is included to the upper-middle income country group, as those with gross national income per capita between $3,706 and $11,455 according to the Atlas Method calculation of World Bank. Turkey has experienced significant size and number of crises in the history. Most of them were originated by the macroeconomic and political choices as well as the global financial crises.

Some important episodes in the Turkish financial system could be listed as Ottoman period of 1847-1923, national banks period of 1923-1932, state-owned banks period of 1933-1944, private banks period of 1945-1960, planned period of 1960-1980, financial liberalization period of 1980-2001 and restructuring period of 2002-2007 (The Banks Association of Turkey, 2009). In the Ottoman period, the first bank was founded by Galata Bankers in 1847. The first banknote was issued in 1840 to compensate budget deficits. This period proved the importance of national banking and government support for national banking (Akgüç, 1989; Zarakolu, 1973). The national banks period (1923-1932) is the development phase of the Turkish economy. However, the Global Depression had negative effects on the Turkish economy. Main achievement was to establish Central Bank in June 1930, even though it was used to finance the deficits of public sector rather than executing an efficient monetary system (Akgüç, 1989). In the state-owned banks period (1933-1944) banking sector was used to finance the World War II and State Owned Enterprises (Zarakolu, 1973). Great Depression led to the closure of a many single-branch local banks in the beginning of 1930s due to the decreasing revenues. One of the biggest state-owned bank called Ziraat Bankasi obliged to extend huge amount of loans to the Government to cover the defense expenditures, which in turn led to a sharp contraction in agricultural loans during 1940-1944 period (Tezel, 1986). In the private banks period (1945-1960) main policy was to accelerate the economic development by the support of private sector. Foreign capital encouragement law was enacted in 1954 for the purpose of accelerating foreign capital inflows and foreign capital investments. Increasing investments, production and welfare necessitated more loans. Economic balances began to deteriorate since governments kept using the resources of Central Bank. Inflation, foreign trade deficit, and external debt increased by 1953. In 1958, the Banks Association of Turkey was established with the purpose of developing the banking business, to ensure the cooperation among banks and for the prevention of unfair competition (Akgüç, 1989). In the planned period (1960-1980) there was a shift to mixed economy with an increased government intervention. An import substitution policy was followed and the economy was governed as a closed economy in order to protect the domestic industries. Banks' basic role has been the financing of the investments stated in the development plans. Most of the privately held Turkish commercial banks become holding-banks by the encouragement of the government with the purpose of increasing private sector investments (Artun, 1983). In this period, negative reel interest on deposits enabled the development of multi-branch banking (Apak, 2007). Difficulties of public sector which could not secure resources and fail to increase the existing ones led the public sector depended to Central Bank loans. This resource was creating inflation due to the emission operation of Central Bank (Artun, 1983).

In the financial liberalization period (1980-2001), 1980 is a milestone for the Turkish banking sector. On July 1, 1981 interest rates were allowed to float freely. In 1982 some banks with weak management were seized, closed, merged or unified with other names (Karacan, 1996). The Banks Liquidation Fund, which was formed in 1960, transferred into the Savings Deposit Insurance Fund in 1983. The task of administration and representation of the Savings Deposit Insurance Fund was transferred to the Central Bank of Republic of Turkey and legalized in 1985. By the new regulations in 1989, most of the financial institutions preferred to use foreign exchange that led a severe liquidity problem in banking sector. Banks invested in government bonds and Treasury Bills by taking significant currency risk because of their open positions, which in turn led to a highly volatile financial environment (Conkar et al., 2009). Turkey experienced huge fiscal and external imbalances until the first quarter of 1994. The main reason behind the crisis of 1994 was the unbounded growth of domestic debt stock. The Public Sector Borrowing Requirement of Turkey increased steadily between 1988 and 1993. In April 5, the Government announced an economic stabilization program (Celasun, 1998). International rating agencies downgraded the note of Turkey. The Turkish Banks faced difficulty acquiring borrowings from foreign financial markets. Resources channeled to offshore banks in order to avoid the domestic monetary and financial burdens (The Banks Association of Turkey, 2009). After the output loss of 6.1% in 1994, the economy grew by 7.5% and 8% in 1995 and 1996 respectively (Celasun, 1998).

The effects of the 1998 Russian crisis, the Marmara earthquakes of 1999, early elections and change of

government affected the Turkish economy negatively (The Banks Association of Turkey, 2009). The Banking Law Nr. 4389 that came in force on June 18, 1999, introduced major international standards and criteria into the banking system (Erdogan, 2002). Turkey agreed to apply International Monetary Fund (IMF) policies supported by the 3 year exchange rate based disinflation program (Yeldan, 2001). The new economic program, applied towards the end of 2000, put the banks into difficulties by asking them to close their open positions (Yay et al., 2001). Overnight interest rates jumped to 900% and interest rates on the public papers climbed to 50%. The confidence to the program was lost. The program was collapsed one more time in November 2000 as a result of the liquidity crisis caused by the sudden capital outflow (Ekinci and Ertürk, 2007). The drastic increases in the interest rates created damage in the fiscal structure of banks and worsened the existing structural problems of banking system. Under the scope of the stability program, Banking Regulation and Supervision Agency requested banks to solve their open position problems until the end of 2000. Banks' assets that almost composed of government bonds emerged the intense need for liquidity and the scarce liquidity blocked the flow of payments in the economy (Keyder, 2001). A political crisis followed these stressful times in February 2001. The program and the fixed exchange rate system collapsed and floating exchange rate system began to be implemented by ending the disinflation program. Excessive optimism in the banking system, insufficient inspection, maturity mismatch, lack of financial management in public sector, deformity in financial structure (duty losses of public banking, holding banking and inadequate capital stock) and deposit guarantee application could be stated as the bases of the financial crises in this period (Sakar, 2009). Many banks were transferred to the Savings Deposit Insurance Fund. While some of them were sold to the private sector, some others unified under different names (Karluk, 2002). Banking Regulation and Supervision Agency started a comprehensive multi-year restructuring program for the Turkish Banking system after the 2001 crisis. The program had four main pillars: restructuring of the state banks, prompt resolution of the Savings Deposit Insurance Fund banks, strengthening the private banks, strengthening the regulatory and supervisory framework (Conkar et al., 2009). In restructuring period (2002-2007), "Program for transition to strong economy", which was put into practice in 2001, was revised at the beginning of 2002. Program targeted increasing the resilience of the economy against shocks, reduce the inflation and debts of public sector, ensure financial discipline, completion of financial reforms and reinforcement of banking system. Central Bank of Republic of Turkey's duty was defined as price stability and the Bank was delegated instrument independence, and a Monetary Policy Board was established. Public borrowing rate fell down and its maturity became longer due to the increase in the inflow of foreign resources and the fall in risk premiums (The Banks Association of Turkey, 2009). The Banking Regulation and Supervision Agency was established as a regulatory and financial authority with administrational and financial autonomy and top priority was given to the amendments in the Banking Law. The first pillar of the banking restructuring process was to solve the financial challenges encountered by the banking sector. Some of the banks under the Savings Deposit Insurance Fund control were sold while the others were merged. As a second pillar of restructuring process, considerable public resources were transferred to strengthen the capital structures of the state-owned banks. At the last stage, a program was adopted for reinforcement of the equity capital of private banks with low asset quality. The Banking Regulation and Supervision Agency, aimed to increase the transparency of balance sheets of banks, ensure compliance with international accounting standards and strengthen the financial structure of banks by considering international regulations while adopting the said regulations. The ratio of non-performing loans to total loans (before provisioning) in the banking sector increased to 29.5% at the end of 2001. "Istanbul Approach" was introduced in 2002 for a period of three years in order to solve the non-performing loan problem. Following the restructuring process, performance of the banking sector rocketed between the 2002-2008 periods. The total assets increased to $465 billion from $130 billion, total asset/GDP ratio to 77% from 57%. The numbers of branches and headcount increased swiftly. The shareholders' equity of the sector increased to $54 billion from $16 billion and its free equity to $40 billion from $3 billion. Risk management systems improved and public supervision became more effective in this period. Favorable domestic and international economic conjuncture contributed to the positive developments in the Turkish financial sector as well.

3. Capital buffer in Turkish banking sector and business cycles

Since the seminal paper of Modigliani & Miller (1958), capital structure in companies has been among the most important topics in finance area and Berger et al. (1995) identify "safety net" as a factor that is functional in the capital structure of financial institutions. The first models of banking crises were developed by Bryant (1980), Diamond and Dybvig (1983). According to these models optimal insur-

ance against liquidity shocks can be provided by deposit contracts but the fixed liabilities make the banks vulnerable to bank runs (Kaminsky, 2003). According to Merton (1977) more generous deposit insurance weakens the market discipline enforced by depositors and encourages banks to take greater risks. Some empirical evidence confirms this effect, showing that deposit insurance increases the possibility of banking crises (Demirgüc-Kunt and Detragiache, 2002; Fonseca, A.R. and González, F., 2010). According to Fonseca and González (2010) capital requirements have stabilizing effects so it aims to neutralize banks' risk-shifting incentives worsened by the provision of a government safety net. Nier and Baumann (2006) find that government safety nets result in lower capital ratios, while stronger market discipline resulting from uninsured liabilities and disclosure results in higher capital ratios (Fonseca, A.R. and González, F., 2010). Capital regulation in the form of minimum capital requirements is the most popular instrument in current banking regulations. The dominance of minimum capital requirements is the consequence of the deregulation process starting in the 1970s (Stolz, 2007). In June 2004, the Basel Committee on Banking Supervision published the final draft of the revised framework for capital measurement and capital standards (BCBS, 2004), known as Basel II. The document substitutes the 1988 capital accord, named Basel I. Basel II is based on three pillars, namely: minimum capital requirements, supervisory review and market discipline. As for the first pillar, the main objective of the draft framework is to make the capital requirements more risk sensitive. Basel II requires banks to maintain the capital ratio above the solvency coefficient of 8% as in Basel I (Pederzoli and Torricelli, 2005). The term 'capital buffer' means the amount of capital banks hold in excess of that required of them by national regulators (Jokipii and Milne, 2008). Capital adequacy ratio (CAR) is often viewed as a "buffer" against insolvency crises, limiting the cost of financial crisis by reducing the possibility of insolvency of banks (Eichberger and Summer, 2005). Basel II Accord has been criticized for its possible procyclicality side effect since the accord requires banks to increase their capital ratios when they face greater risks. According to Gordy and Howells (2006) this may require them to lend less during a recession or a credit crunch, which could intensify the downturn. Chiuri et al. (2002) found consistent evidence that the imposition of capital regulation induced a reduction in loan supply and, hence, in total lending in their sample countries. Single country studies, such as Furlong (1992) and Haubrich & Wachtel (1999), concluded that capital regulations in the U.S. contributed to a decrease in lending that helped fuel a post capital credit crunch. Jackson et al.'s (1999) conclusion is that in the near term banks mainly respond to strict capital requirements by reducing lending and that there is little conclusive evidence that capital regulation has encouraged banks to maintain higher capital-to-assets ratios than they otherwise would choose if unregulated. Restricting bank activities through a higher capital requirement ratio could be negatively associated with bank development, adversely affecting credit expansion and credit growth. However, Goddard, Molyneux and Wilson (2004) find a positive relationship between the capital-to-asset ratio and profitability for European banks (Naceur and Kandil, 2009). Koehn and Santomero (1980) and Kim and Santomero (1988) found that a forced reduction in leverage reduces a bank's expected return and may lead bank owners to undertake investments with higher return and higher risk. In some cases, increased bank risk offsets the increase in capital, leading to a greater default probability. The introduction of risk-based capital standards is an attempt to eliminate this potentially negative effect of capital requirements (Ayuso et al., 2004). Danielsson et al. (2001) argued from a macroeconomic point of view that a co-movement in capital requirements and the business cycle might induce banks to reduce lending during recessions due to the high capital requirement. The opposite would apply in economic expansions. This mechanism would tend to worsen business cycle peaks and troughs (Pederzoli and Torricelli, 2005). Significant amount of researchers have focused on analyzing the cyclical behavior of capital buffer. Furfine (2000) examined U.S. banks, Rime (2001) examined Swiss banks, Ayuso et al. (2002, 2004) examined Spanish banks, Lindquist (2004) examined Norwegian banks, Stolz and Wedow (2005) examined German banks, and all of them found evidence of a negative relationship between the cycle and the buffer (Ayuso et al., 2004). Jokipii and Milne (2008) find a similar negative relation for the 15 countries of the European Union in 2004. Flannery and Rangan (2008) analyzed the influence of market discipline on capital buffer using data from the 100 largest U.S. banking firms for (1986-2000) and observed that these large bank holding companies raised their capital ratios after 1994 and that none of them has been constrained by regulatory capital standards since 1995. Nier and Baumann (2006) provide evidence that market discipline has a positive influence on capital buffer in a sample of banks in 32 different countries. Fonseca and Gonzales (2010) analyzed a sample of banks in 70 countries. Their results suggest that the net effect on capital buffer is negative. They found that only stringent accounting disclosure requirements and less generous deposit insurance have a clear positive effect on capital buffer. Lindquist (2004), found

support for the hypothesis that capital buffer serves as an insurance against failure to meet the capital requirements. He estimates a model separately on savings and commercial banks and found that the level of the capital buffer is in general much higher for savings banks than for commercial banks. Heuvel (2004) measured the welfare cost of capital and found that it is surprisingly large. A capital requirement limits the moral hazard on the part of banks that arises due to deposit insurance. However, it is also costly because it reduces the ability of banks to create liquidity. His study is related to recent work by Diamond and Rajan (2000) and Gorton and Winton (2000), who show capital requirements may have an important social cost because they reduce the ability of banks to create liquidity. Determining the sufficient buffer size is an important risk management task for banks and the Basel Committee suggests stress testing approach for that (Peura and Jokivuolle, 2004). Although a common feature of banking models is that banks will not have capital ratios above the minimum required if federal insurance guaranties bank liabilities (Merton, 1977; Ayuso et al., 2004). There could be different motivations behind holding capital buffer. Banks may tend to assess their risks by their in-house capital models. They might keep capital buffer in order to show their soundness to the market or to the rating agencies (Jackson, 1999). Legal requirements may oblige banks holding more capital. Banks may hold a capital buffer not to exceed the limit of minimum capital (Marcus, 1984; Milne and Whalley, 2001; Milne, 2004) or as an insurance against a violation of requirements, which in turn caused an increase in costs by the supervisory authorities. Another motivation to use capital buffer is to take the advantage of future "growth opportunities". Banks with relatively low capital may lose their market in an environment of increasing loan demand (Jokipii and Milne, 2008). Zarrouk and Ayachi (2009), according to their findings based on their econometric model prepared for the period of 1990-2004, stress that in emerging countries the existence of a deposit insurance system is negatively linked with banking crises and higher levels of corruption leads to increased banking sector vulnerability. As a key health indicator, capital adequacy ratio shows the ability of banks to absorb the potential future losses while it inspires confidence in the banking sector. In the Turkish banking system, capital adequacy standard ratio (Basel I) was put into effect gradually starting from 1989. The market risk regulations introduced by the Basel Committee were established in 2001 and 2002 in Turkey (Asarkaya and Ozcan, 2007). Basel II was published in June 2004 and reached its final version in June 2006. Currently, capital adequacy in the banking system is calculated on the basis of "Regulation on Measurement and Assessment of Capital Adequacy of Banks", published in the Official Gazette dated on November 1, 2006. One of the basic amendments that Basel II brings has been met by the current regulation, and operational risk component was included in capital adequacy calculations as of June 2007. Implementation of Basel II is in progress in many countries. Likewise, Banking Regulation and Supervision Agency is executing a plan to ensure the implementation of Basel II by the banks operating in Turkey. Banking Regulation and Supervision Agency has done a lot under the scope of the adaptation process. However, in a global crisis environment, some deficiencies pinpointed in Basel II and the enacted Turkish Commercial Code Draft caused the implementation of capital requirements measurement based on the credit risk ratings to be postponed to a further date.

As a consequence of the lessons learned from the previous financial crises stemmed from Turkey's own dynamics, precautions and restructuring efforts among financial regulators, financial institutions and financial system, Turkish banking sector is affected from global financial crises to a rather limited extent in comparison to its peers. The reasons behind this limited negative effects could be justified by holding high capital adequacy ratio, high asset quality and low currency and liquidity risks based on risk management and public supervision, and effective management of other risks, as well. The measures taken by the Central Bank and Banking Regulation and Supervision Agency contributed to the healthy functioning of banking sector against the uptrend of risks in global financial markets (The Banks Association of Turkey, 2009). In the Turkish banking system, capital adequacy ratio is above the legal limit of 8% since 1998 (see Table 1). Especially, after the 2000 and 2001 crises, by the beginning of restructuring period, capital adequacy ratio has been increased well above the legal requirement and even the target ratio of 12% set in 2006 by Banking Regulation and Supervision Agency, far exceeding that of many other emerging markets even in the global financial crisis years. There could be several motivations behind keeping a capital buffer in excess of that required by the regulations. The general view is to protect banks against negative shocks with a cushion. In the Turkish banking system, sound financial position of Turkish banks protects them from asset quality deterioration and puts them under less pressure in their lending activities by the positive effect of capital buffer.

Table 1. Capital adequacy ratio (CAR) of the Turkish banking system

Years	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CAR (%)	13.0	8.2	9.3	20.8	25.3	30.9	28.2	23.7	21.9	18.9	18.0	20.0

Source: From Crisis to Financial Stability (Turkey experience), Revised second addition, Working Paper, 2009, Banking Regulation and Supervision Agency.

In this paper, we examine the utilization of capital buffer in the Turkish banking system and its cyclical behavior. We gather the data for the capital buffer of Turkish banks and real GDP growth rates of Turkey for the period of 1997-2004. The same period has been selected in order to make a meaningful comparison between our findings with those of Jokipii and Milne's (2006) study "Understanding European Banks Capital Buffer Fluctuations". We consider capital buffer as the amount of capital beyond the legal limit required by the regulators. Table 2 and Table 3 present minimum capital requirements for the European and Turkish banking sector.

Table 2. Capital requirements of the banks in the EU

	Minimum required ratio	Year of implementation
UK	9%	1979
CY	8% 10%	1997 2001
CZ	8%	1992
EE	10%	1997
HU	8%	1991
LAT	10% 8%	1997 2004
LIT	10% 8%	1997 2005
MAL	8%	1994
PL	8%	1992
SK	8%	1997
SL	8%	2002

Note: UK – United Kingdom, CY – Cyprus, CZ – Czech Republic, EE – Estonia, HU – Hungary, LAT – Latvia, LIT – Lithuania, MAL – Malta, PL – Poland, SK – Slovakia, SL – Slovenia.
Source: Jokipii and Milne (2006).

Table 3. Capital requirements for the Turkish banks

Minimum required ratio	Year of implementation	Target ratio
5%	1989	-
6%	1990	-
7%	1991	-
8%	1992 to 2009	12%*

Note: * In Turkey, capital requirements increased gradually since 1989 and a target ratio is declared by Banking Regulation and Supervision Agency according to Banking Regulation and Supervision Agency Board Decision No 2026 dated November 16, 2006.
Source: Banking Regulation and Supervision Agency.

Table 4. Capital buffer by country

%	1997	1998	1999	2000	2001	2002	2003	2004	Avg.
AT	2.8	2.5	1.8	3.4	5.2	4.4	10.0	6.5	4.6
BE	3.8	4.7	3.8	4.9	5.2	5.1	6.3	5.5	4.9
DE	2.1	2.3	2.8	3.1	2.7	3.4	4.8	5.4	3.3
ES	5.6	5.3	4.7	3.7	3.9	3.6	3.6	3.6	4.2
FI	6.6	4.4	3.7	3.5	3.7	3.4	5.7	5.3	4.5
FR	5.1	4.6	3.8	3.8	4.0	4.3	3.4	2.9	4.0
GR	2.3	2.1	9.5	7.2	3.9	2.8	6.0	5.3	4.9
IE	4.3	3.7	3.2	2.9	4.6	4.3	4.4	3.9	3.9
IT	4.3	5.8	4.4	4.5	2.5	3.0	3.0	3.7	3.9
LU	6.1	4.8	4.8	4.6	4.5	4.9	6.6	4.9	5.2
NL	7.1	8.0	5.6	5.5	6.1	6.7	7.6	7.6	6.8
PT	9.3	8.2	7.9	6.3	5.0	4.4	5.3	5.8	6.5
DK	4.4	3.4	3.3	2.7	3.0	3.7	4.9	4.2	3.7
SE	2.6	6.7	5.8	5.4	4.6	4.9	5.3	5.0	5.0
UK	13.1	10.7	12.4	10.7	9.5	10.0	11.8	8.2	10.8
CY	2.1	1.7	2.5	4.5	5.7	6.0	5.4	5.3	4.2
CZ	2.9	10.2	12.2	6.2	7.3	6.9	6.7	4.8	7.2
EE	3.1	7.7	9.1	6.2	6.3	6.2	5.3	4.3	6.0
HU	5.0	6.5	6.7	5.9	4.2	4.8	3.3	3.2	5.0
LAT	10.1	3.6	8.4	5.5	4.6	4.5	4.3	4.4	5.7
LIT	6.3	14.4	5.5	4.8	6.7	6.7	4.1	3.1	6.5
MAL	6.5	8.4	8.0	8.1	6.5	7.1	7.6	6.9	7.4
PL	1.9	3.7	5.2	4.9	5.8	4.9	4.8	7.4	4.8
SK						5.4	9.2	9.5	8.0

Table 4 (cont.). Capital buffer by country

%	1997	1998	1999	2000	2001	2002	2003	2004	Avg.
SL	6.3	4.6	6.7	8.1	7.6	7.6	5.7	6.3	6.6
EU25	5.2	5.8	5.9	5.3	5.1	5.2	5.8	5.3	5.4
EU15	5.3	5.2	5.2	4.8	4.6	4.6	5.9	5.2	5.1
EA	5.0	4.7	4.7	4.5	4.3	4.2	5.6	5.0	4.7
DK,SE,UK	6.7	6.9	7.2	6.3	5.7	6.2	7.3	5.8	6.5
RAM	4.9	6.8	7.1	6.0	6.1	6.0	5.6	5.5	6.0
Maximum	13.1	14.4	12.4	10.7	9.5	10.0	11.8	9.5	10.8
Minimum	1.9	1.7	1.8	2.7	2.5	2.8	3.0	2.9	3.3

Note: AT – Austria, BE – Belgium, DE – Germany, ES – Spain, FI – Finland, FR – France, GR – Greece, IE – Ireland, IT – Italy, LU – Luxembourg, NL – Netherlands, PT – Portugal, DK – Denmark, SE – Sweden, UK – United Kingdom, CY – Cyprus, CZ – Czech Republic, EE – Estonia, HU – Hungary, LAT – Latvia, LIT – Lithuania, MAL – Malta, PL – Poland, SK – Slovakia, SL – Slovenia; EU25: AT, BE, DE, ES, FI, FR, GR, IE, IT, LU, NL, PT, DK, SE, UK, CY, CZ, EE, HU, LAT, LIT, MAL, PL, SK, SL; EU15: AT, BE, DE, ES, FI, FR, GR, IE, IT, LU, NL, PT, DK, SE, UK; EA (European area): AT, BE, DE, ES, FI, FR, GR, IE, IT, LU, NL, PT, DK, SE, UK: Denmark, Sweden and United Kingdom. RAM (recently accessed member states): CY, CZ, EE, HU, LAT, LIT, MAL, PL, SK, SL.
Source: Jokipii and Milne (2006).

Table 5. Capital buffers of Turkish banks

	1997	1998	1999	2000	2001	2002	2003	2004	Avg.
TR-total sample	7.5	8.0	-4.5	-6.4	16.8	16.4	20.4	21.2	9.9
TR-total sample excluding SDIF* banks	9.8	12.5	9.8	12.0	16.8	16.4	20.4	21.2	14.9
TR-dev. and inv. banks	20.0	29.9	28.3	29.8	37.6	34.2	42.0	47.1	33.6
TR-state-owned banks	4.8	5.2	6.9	11.7	14.0	22.2	26.5	27.8	14.9
TR-state-owned dep. banks	-1.5	-2.5	-3.2	-3.4	-0.7	1.2	2.9	1.62	-0.7
TR-privately-owned dep. banks	2.7	4.0	3.6	6.5	1.6	3.7	9.3	10.7	5.3
TR-foreign banks	12.8	12.4	6.9	9.6	13.7	13.5	13.7	11.0	11.7
TR-SDIF* banks	3.3	-0.1	-31.7	-43.4	n.a.	n.a.	n.a.	n.a.	n.a.
Maximum	20.0	29.9	28.3	29.8	37.6	34.2	42.0	47.1	33.6
Minimum	-1.5	-2.5	-31.7	-6.4	-0.7	1.2	2.9	1.6	-0.7

Note: TR-total sample – all Turkish banks in the data set, TR-total sample excluding SDIF banks – total sample excluding banks under control of Savings Deposit Insurance Fund, TR-dev. and inv. banks – development and investment banks in Turkey, TR-state-owned banks – state-owned banks in Turkey, TR-state-owned dep. banks – state-owned deposit banks in Turkey, TR-privately-owned dep. banks – privately-owned deposit banks in Turkey, TR-foreign banks – foreign banks in Turkey, TR-SDIF banks – banks under the control of Savings Deposit Insurance Fund. *Banks under control of the Savings Deposit Insurance Fund.
Source: BRSA.

Table 4, presents the level of capital buffer of the European Banks which its average capital buffer is around 5%, above the required capital ratios. In Turkey, average capital buffer is around 10% for TR-total sample, which is well above the required capital ratios. Capital buffer of TR-total sample excluding the banks under the control of Savings Deposit Insurance Fund is around 15%. Capital buffers of banks under the control of the Savings Deposit Insurance Fund are in dramatically negative level in 1999 and 2000 and as the Savings Deposit Insurance Fund took over their control, no data is available afterwards. Turkish development and investment banks (TR-dev. and inv. banks) perform their activities with remarkably high capital buffers, as 33% in average is well above all types of banks in Turkey and all banks in Europe in average terms. In Turkish Banking System, state-owned deposit banks (TR-state-owned dep. banks) are the ones with negative capital buffers in average terms, which is in line with the understanding of "too big to fail" hypothesis. As also discussed by Jokipii and Milne (2006), larger banks generally expect a "bail out" when they face serious financial bottlenecks.

Figure 1 presents the average capital buffers for the period of 1997-2004. We create two classifications for the Turkish banking sector by their types and size. We scale size of banks according to the share of their total assets in the Turkish banking sector. Capital buffers of the banks under the Savings Deposit Insurance Fund have negative values for the years of 1999 and 2000. There is no data available for these banks after the restructuring period as these banks, sold and/or merged under a different structure by the Savings Deposit Insurance Fund. As banks under the control of the Savings Deposit Insurance Fund are broken eggs in the basket, eliminating them from the system reveals the facts of today's banking system. Capital buffers of TR-total sample excluding banks under the control of the Savings Deposit Insurance Fund are low in pre-crises years of 1999 and 2000 but the ratios are still

well above the required limits. Although 2001 is another crisis year, capital buffer skyrocketed because of the restructuring program in the banking sector. By the lessons learned and actions taken in the banking system, buffers fluctuate within the band of 16% and 21% after 2001. When we compare TR-total sample excluding banks under the control of the Savings Deposit Insurance Fund with that of European Union 25 countries banking sector, we find that European Union 25 countries have much more stable capital buffers with an average around 5%. The capital buffers of TR-total sample excluding banks under the control of the Savings Deposit Insurance Fund range between 9.8% and 21%, which is well above the European Union 25 countries' capital buffers.

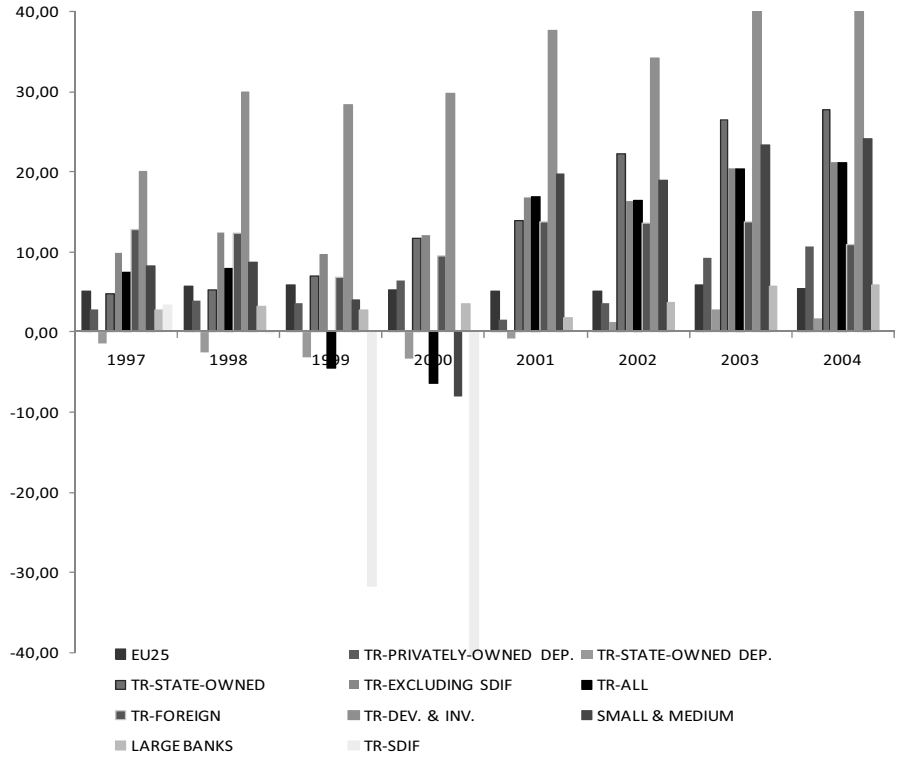

Fig. 1. Capital buffers of Turkish and EU banks

In this paper, we gather data from the Banks Association of Turkey for 64 Turkish banks. In order to be able to classify them we have grouped them by their types as listed in Table 6 and by their size as listed in Table 7. Even though there are 64 banks listed in our study, 20 of them are transferred to the Savings Deposit Insurance Fund (SDIF) because of their financial and governance stability problems. Since these banks are either closed or sold, total sample excluding SDIF banks is a much more meaningful categorization for the all sound banks operating in Turkey. Table 6 also reveals the appetite of the foreigners in Turkish banks. 17 out of 44 foreign banks are either founded in Turkey or having branches in Turkey.

Table 6. Distribution of Turkish banks by type

Type of banks	Number of banks
State-owned deposit banks	3
Privately-owned deposit banks	11
Foreign banks (founded in Turkey & having branches in Turkey)	17
Development and investment banks (state-owned, privately-owned & foreign)	13
SDIF* banks	20
Total sample excluding SDIF* banks	44
Total sample (all banks)	64

Note: *Banks under the control of the Savings Deposit Insurance Fund.

Table 7. Distribution of Turkish banks by size

Size of banks	Number of banks
Small and medium sized banks (banks which have an average asset size less than 5% of total assets of Turkish banking system (for the period between 1997-2004)	57
Large banks (banks which have an average asset size more than 5% of total assets of Turkish banking system (for the period between 1997-2004)	7
Total sample (all banks)	64

The Figure 2 comprises capital buffers and real GDP growth rates that we provide from the Turkish Statistical Institute. Besides the fluctuation of capital buffers, we also examine output gap by applying Hoddrick-Prescott (HP) filter to real GDP series, for a detailed understanding of the relation between business cycle and capital buffers.

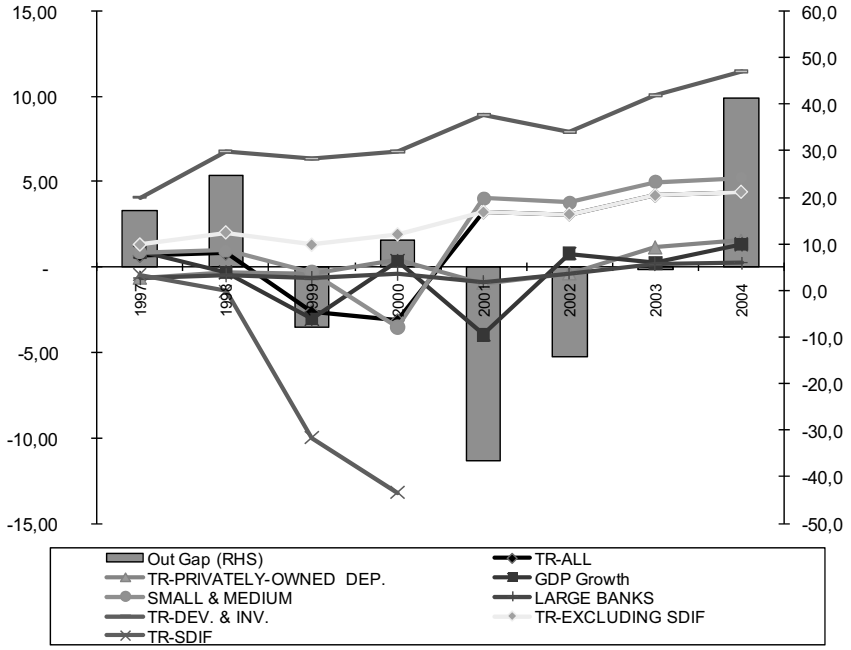

Fig. 2. Capital buffers by bank type and size

Although, growth rates in the Turkish economy are positive for the years of 1997 and 1998, Figure 2 presents that growth has a descending pace for these years. Dramatic narrowing in year 1999 reflects the fragile economic conditions of pre-crisis period. The new banking law with many international criterions issued in June 1999 and Turkey agreed to apply an IMF supported program in the same year. Growth rate was rocketed to 6.3% in year 2000 even in a crisis environment, thanks to the taken measures. There is a drastic narrowing due to the currency crisis of year 2001. Growth rate is the worst in year of 2001, within the examined period. Turkish banking sector succeed to reach high growth rates for the following three years, after a challenging period followed by revolutionary banking restructuring program that generates favorable results for the Turkish economy.

Table 8. Output gap (RHS) and capital buffer

Bank type	97-98	98-99	99-00	00-01	01-02	02-03	03-04	Cyclicality
Privately-owned deposit banks	+	+	+	+	+	+	+	Pro-cyclicality
Development and investment banks	+	+	+	-	-	+	+	Pro-cyclicality*
SDIF*** banks	-	-	-	n.a.	n.a.	n.a.	n.a.	Counter-cyclicality
Total sample excluding SDIF*** banks	+	+	+	-	-	+	+	Pro-cyclicality*
Total sample	+	+	-	-	-	+	+	Pro-cyclicality**
Small and medium-sized banks	+	+	-	-	-	+	+	Pro-cyclicality**
Large banks	+	+	+	+	+	+	+	Pro-cyclicality

Notes: *There is co-movement between output gap and capital buffer except 2000 and 2001 crises. **There is co-movement between output gap and capital buffer except pre-crisis year of 1999 and crises years of 2000 and 2001. ***Banks under the control of the Savings Deposit Insurance Fund. n.a. – not available.

In Table 8, we have examined cyclical behavior of capital buffers. It should be noted that in the paper, pro-cyclical movements of capital buffers refer the co-movement between the two variables rather than the explanations under BASEL literature. According to our examination, private deposit banks and large banks fluctuate pro-cyclically. Development and investment banks and total sample excluding banks under control of the Savings Deposit Insurance Fund are found to move pro-cyclically except crises years of 2000 and 2001. Small and medium sized banks move pro-cyclically except pre-crises year of 1999 and crises years of 2000 and 2001. Our findings are in line with Jokipii and Milne's (2006), claiming that raising capital in a decreasing profit environment could be costly and may lead the banks to cut their activities. Excluding crises years, lending behavior of Turkish banks seems to be prudent since they cut down their activities during a downturn and build up capital in order to offset the nega-

tive effects in future. Turkish banks started to hold high capital buffer by year 2000 and continued to perform their activities with high capital buffer on the following years.

We prepare the cyclical behavior of banks capital buffers according to their means as well. Most of our findings are in line with Table 8. Privately-owned deposit banks, large banks, small- and medium-sized banks and total sample are found to move pro-cyclically in both tables. Development and investment banks and total sample excluding banks under control of Savings Deposit Insurance Fund are found to be undefined. Finally, banks under control of Savings Deposit Insurance Fund are found to move pro-cyclically on the contrary to Table 8.

Table 9. Mean of capital buffers

Bank type	Normal	Pre-crisis	Crisis	Cyclicality
Privately-owned deposit banks	6.1	3.6	4.0	Pro-cyclical
Development and investment banks	34.6	28.3	33.7	Undefined**
SDIF* banks	1.6	-31.7	-43.4	Pro-cyclical
Small- and medium-sized banks	16.6	-5.6	5.9	Pro-cyclical
Large banks	4.2	2.7	2.7	Pro-cyclical
Total sample excluding SDIF* banks	16.1	9.8	14.4	Undefined**
Total sample	14.7	-4.5	5.2	Pro-cyclical

Note: * Banks under the control of the Savings Deposit Insurance Fund. **No pro-cyclical or counter-cyclical behavior.

Conclusion and additional remarks

When we consider the trends of financial crises around the world, we realize that developed economies are no more the only triggering source of global crises. The emerging economies are becoming another source to ignite global financial crises due to the dynamics of globalization and increasing market integration. In this financial environment, the frequency and magnitude of global crises are assessed to be catching an upward trend. In the case of Turkey, we expect that the possibility of a financial crisis originated by the internal dynamics within the banking system is reduced after the restructuring of the Turkish Banking System. On the other hand, Turkey becomes a risk sensitive market as a result of increasing globalization and market integration level. Turkey is well positioned among emerging markets and growth potentials of the country attract attention of the global investors. With the pros and cons of being a growing economy within crises, the Turkish banking sector turned into a mature business sector by completing its restructuring process after the latest currency and banking crises. This maturity contributes more to the economic development of the country and is welcomed by the global markets and especially by the European banking environment. After having experienced the drastic financial crises in years of 2000 and 2001, Turkish banking system now reflects its risk aversive attitude by the capital buffer levels it holds. In the coming years, capital buffer levels of the Turkish banking sector may be aligned up in parallel to the national and global risk perception.

In this study, we explore the utilization of capital buffer within the Turkish banking system and examine it's cyclical behavior. We gather data from Banks Association of Turkey for 64 Turkish banks for the period of 1997-2004. Our study indicates that development and investment banks in Turkey operate with the highest capital buffer where state-owned deposit banks operate with negative capital buffer levels in average. Banks under the control of the Savings Deposit Insurance Bank are broken eggs in the basket and they need to be eliminated from the banking sector to protect today's high performer banking system. In this given environment, Turkish banking system operates with capital buffer levels well above the required capital adequacy ratio. Our study presents that capital buffer levels of Turkish banking system are higher than that of EU banking system. Turkish banks especially benefit from capital buffering as a precautionary measure in the latest global financial crisis.

Another finding in our study reveals that privately-owned deposit banks and large banks fluctuate pro-cyclically. Development and investment banks and total sample excluding banks under the control of the Savings Deposit Insurance Fund move pro-cyclically except the crises years of 2000 and 2001. Small- and medium-sized banks move pro-cyclically except pre-crises year of 1999 and crises years of 2000 and 2001. Our findings are in line with the Jokipii and Milne's (2006) study, claiming that raising capital in a decreasing profit environment could be costly and may lead banks to lessen their activities. Excluding crises years, lending behavior of the Turkish banking system seems to be prudent since banks lessen their activities during a downturn and vice versa. Turkish banks has started to hold high capital buffers by year of 2000 and continued to perform their activities with higher capital buffer levels in the following years as well.

Turkey, as an emerging economy, experienced currency and banking crises with dramatic financial consequences. With its banking restructuring program and high capital buffer strategy, Turkish banking sector attracts attention compared to its competitors in the global financial markets. As a consequence of the achievements in the latest global financial crisis, with the pros and cons of growing with crises, Turkish banking sector with its attracting performance during the latest crisis, is becoming much more mature after a revolutionary restructuring period.

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