IMPACT OF SUDDEN STOPS AND INTERNATIONAL RESERVES ON BANK LENDING: EVIDENCE FROM TURKEY

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Abstract: This paper investigates the effects of sudden stops and international reserves on bank lending in a bank-based emerging market economy, Turkey. It includes a panel of deposit banks in Turkey over the period 2003-2013. Using a system GMM estimation technique, we find that sudden stop of capital inflows has led to deterioration in bank lending. Moreover, the results reveal that over the sudden stop periods higher international reserves held by the Central Bank have served as a buffer and prevented decline in bank lending. Another striking feature of the findings is that higher liquidity and higher deposit ratio have encouraged bank lending over the sudden stop periods whereas higher capitalization ratio placed a reverse impact on bank lending. Overall, we expect that the results provide important implications for similar emerging market economies which have fragile economic structures.

Keywords: Sudden stops, international reserves, bank loans, dynamic panel data, Turkish banking industry.

ANİ DURUŞLARIN VE ULUSLARARASI REZERVLERİN BANKA KREDİLERİ ÜZERİNE ETKİLERİ: TÜRKİYE ÖRNEĞİ

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Öz: Bu çalışma, bankacılık temelli bir ekonomi olan Türkiye'de, ani duruşların ve uluslararası rezervlerin banka kredileri üzerindeki etkilerini araştırmaktadır. Çalışmada 2003-2013 döneminde Türkiye'de faaliyet gösteren mevduat bankalarından oluşan bir panel veri seti kullanılmaktadır. Sistem Genelleştirilmiş Momentler Yöntemi kullanılarak, sermaye girişlerindeki ani duruşun bankaların kredi verme kararlarını olumsuz etkilediği bulunmuştur. Bunun yanı sıra, Merkez Bankası tarafından daha fazla uluslararası rezervin tutulmasının ani duruş dönemlerinde bir tampon görevi gördüğü ve banka kredilerindeki azalışı önlediği bulgusuna ulaşılmıştır. Bir diğer ilgi çekici sonuç ise yüksek likiditenin ve yüksek mevduat oranının ani duruş dönemlerinde bankaları kredi verme yönünde teşvik ettiği ancak yüksek sermaye oranının olumsuz etki yarattığıdır. Çalışmadan elde edilen tüm sonuçlar dikkate alındığında, kırılgan ekonomik yapılara sahip benzer yükselen piyasa ekonomileri için önemli çıkarımlar elde edilmesi beklenmektedir.

Anahtar Sözcükler: Ani duruşlar, uluslararası rezervler, banka kredileri, dinamik panel veri, Türk bankacılık sektörü.

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INTRODUCTION

The international economic arena has witnessed dramatic growth of international financial transactions over the last thirty years. Steps taken towards liberalization of the economic activities, development of information and communication technologies have eased the mobility of capital among the countries. Particularly developing economies experienced fast capital inflows. From the late 80's to the end of 90's, net private capital flows to developing countries tripled[1]. The developing economies with low savings rate happily welcomed these capital inflows and used them to finance domestic investment. However it did not take too long for them to realize the risks. Low persistence and high volatility characteristics of the international capital together with the lack of deep and sound financial system brought many hosting economies to the edge of crisis.

Turkey is one of these countries who has gradually become dependent on the international capital inflows. These capital inflows have boosted economic growth. Since economic growth is financed through foreign funds, current account deficit has also accompanied economic growth. Unfortunately, dependence on foreign asset purchases embodies the risk of "sudden stop". Goldfajn (2001: 2) defines sudden stop as a very large change in the supply of capital in the negative direction which leads to dramatic depreciation and big, large drops in financing from one day to the next. The chain reaction following a sudden stop would first put a significant pressure on the liquidity in financial system. Banks would curtail the supply of loans. For the Turkish economy where banking sector constitutes about 90 percent of the financial system, contraction in the supply of funds brings together the contraction in the real economy. The literature on the causes and consequences of sudden stops has developed parallel to the rapid financial openness and crises of emerging economies in recent years. Most of the research is on the macroeconomic implications of sudden stops (see for example Becker and Mauro, 2006: 15-19; Cardarelli et al., 2009: 13-17; Bordo et al., 2010: 235-238; Calderon and Kubota, 2011: 124-137; Cerra et al., 2013: 429-436). Most empirical research on the impact of sudden stops on the credit supply and banking industry is at macro level (see for example Joyce and Nabar, 2009: 315-319; Neagu and Mihai, 2013: 10-13). For the Turkish banking system, Togan and Berument (2011: 12-18) have analyzed the relationship between current account balance, capital flows and bank loans over the 1986-2010 period. Their findings reveal that capital inflows have been the pioneering indicator of loan growth in the Turkish banking system. However, the literature is rather virgin when the microeconomic implications of the sudden stops on banking industry are considered. Only, Brei (2007: 27-34) focuses on the impact of sudden stops on bank lending using bank-level data for banks operating in East Asia

and Latin America over the period 1991-2004. To the author's best knowledge, there is no study analyzing the impact of sudden stops on Turkish banking industry at micro level.

In fear of sudden stops, emerging economies have been accumulating substantial amount of international reserves. Holding increasingly more amount of international reserves towards the objective of easy foreign borrowing, lowering the country risk premium and establishing a flexible area for monetary policy operations may have important implications on the banking system. Recently, Turkey has also experienced fast growth of international reserves. From 2011 to the end of 2013 the reserves have increased from USD 88 billion to USD 135 billion (CBRT EDDS[2]). CBRT has launched a tool called Reserve Option Mechanism (ROM) to avoid the possible risks of fast and volatile capital flow and ensure financial stability by the early periods of 2012. This policy has increased the international reserves of the Central Bank. As an outcome of this tool, liquidity of banks in terms of Turkish Lira has increased. Obviously, such fast and significant accumulation of international reserves will likely have some implications on the Turkish banking industry. Particulary, the combined effect of precautionary reserve holdings and the ROM will create a potential for the banks to increase their supply of loans. Recent literature mainly focuses on the costs of holding excess international reserves. Some of these studies focus on the macroeconomic implications of international reserve holdings (see for example Mohanty and Turner, 2006: 41-48; Fukuda and Kon, 2010: 4-12; Lin, 2011: 1567-1573) while some focus on the social costs (see for example Rodrik, 2006; 6-9). However, the impact of international reserves on the banking industry is not frequently analyzed. A recent paper, Shrestha (2012: 12-21) focuses on this relationship using sample data from East Asian Economies. The findings indicate a positive impact of international reserves on deposits and liquidity in the banking industry. However, the effect of reserves on the bank loans is not significant. To the author's best knowledge, there is no study analyzing the effect of international reserves on the Turkish banking industry.

This papers aims to complement the existing literature through investigating the impact of sudden stops and increasing reserve holdings of the CBRT on the supply of bank loans in Turkey at micro level. The sample includes 35 deposit banks over the period 2003q1-2013q3. The sudden stop periods are identified according to the definition made by Frankel and Cavallo (2004: 7) and Calvo *et al*. (2004: 14). Greenspan-Guidotti ratio, which indicates the ratio of international reserves to short term external debt, is used as a proxy for international reserves[3]. To the author's best knowledge this is the first paper that analyzes the impact of sudden stops and

international reserve holdings on lending behavior of banks for the Turkish economy using dynamic panel data analysis. The results will give an answer to these questions: Do sudden stops affect the loan growth of banks negatively? Does international reserve accumulation of the Central Bank serve as a guarantee for banks to enhance their credit supply over the sudden stop periods? Are there any differences among the lending behavior of banks with different liquidity, capitalization or deposit volume over the sudden stop periods? The results will shed light on the severity of dependence of Turkish banking system on the foreign funds and provide implications for policymakers to set measures to reverse this characteristic. Moreover, the findings may establish a benchmark for other emerging market economies experiencing similar problems. The rest of the paper is organized as follows: Section 2 discusses the data and the variables. Section 3 provides information about the model, methodology and estimation results. The last section is devoted to conclusions.

1. DATA AND VARIABLES

To precise the sudden stop periods, quarterly data over the 2003q1: 2013q3 are used in this paper. The starting date of sample is determined as 2003 so as to satisfy the data consistency after the adoption of inflation accounting and international financial reporting standards in the Turkish banking industry. Deposits banks are included in the sample and bank level data are taken from the database of Turkish Banking Association. Macroeconomic data are taken from the electronic data dissemination system of the Central Bank of the Republic of Turkey. Banks with non-positive total assets, equity capital, loans and deposits are not included in the sample. The definitions and sources of the variables are presented in Table 1.

Table1. Variables: Definitions and sources

Name	Definition	Calculation	Source
LOANGR	Real loan growth rate	Log difference of real total loans (net of non-performing loans)	TBA
SIZE	Bank size	Natural log of total assets	TBA
LIQ	Liquidity	Ratio of liquid assets to total assets ratio	TBA
CAP	Capitalization	Ratio of equity capital to total assets	TBA
DEPTA	Deposit ratio	Ratio of total deposits to total assets	TBA
REALGR	Economic growth	Real GDP growth	CBRT
REALR	Real interest rate	Lending rate net of inflation	IMF IFS
FOR	Indicator for foreign ownership	Dummy variable=1 if at least 50 percent of total assets are owned by foreign partners	OC
CRS	Indicator for global financial crisis	Dummy variable=1 for years 2009 onwards	OC
SS	Sudden stop indicator	Dummy variable=1 if sudden stop is observed	OC/ Frankel, Cavallo (2004: 7); Calvo *et al*. (2004: 14)
GGRATIO	Greenspan-Guidotti ratio	Ratio of international reserves to short-term external debt	OC/ data from CBRT

Note: TBA, CBRT and IMF IFS denote Turkish Banking Association, Central Bank of the Republic of Turkey and IMF International Financial Statistics, respectively. OC abbreviates "own calculations".

The descriptive statistics for the variables are reported in Table 2.

Table 2. Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum	Number of obs.
LOANGR	5.706	44.782	-77.822	402.558	1280
SIZE	7.990	2.086	2.811	11.596	1280
LIQ	16.532	11.058	0.052	73.075	1280
CAP	15.856	10.597	3.655	91.605	1280
DEPTA	55.248	20.168	0.334	123.269	1280
REALGR	5.140	5.257	-14.737	12.592	1280
REALR	13.649	9.382	1.5	36.8	1280
GGRATIO	1.849	0.453	1.098	2.749	1280

The sudden stop periods are determined according to the criteria developed by Frankel and Cavallo (2004: 7) and Calvo *et al*. (2004: 14). They define sharp contraction of international capital flows which have both real and financial implications such as depreciations and significantly lower rates of return, investment and growth as "sudden stop". Moreover, a sudden stop has an unexpected characteristic. To ensure this, periods over which change in capital flows lie at least two standard deviations below its sample mean at least once are defined as sudden stop periods. The period ends when the annual change in capital flows exceeds one standard deviation below the sample mean. Calvo et al. (2004) also state that large nominal depreciation

and output contraction also accompany the sudden stop periods. In this study, financial account surplus is used as a proxy for capital flows[4]. The sudden stop periods for the Turkish economy over the sample period are determined and presented in Table 3.

Table 3. Sudden Stop Periods for the Sample Period

Sudden stops	Periods
SS1	2003q2: 2003q3
SS2	2008q3: 2009q1
SS3	2010q3: 2010q4
SS4	2012q3: 2012q4
SS5	2013q2: 2013q3

Note: SS is abbreviation for sudden stop.

2. MODEL, METHODOLOGY AND ESTIMATION RESULTS

2.1. Model

In order to analyze the implications of sudden stops and international reserves on the loan growth in the Turkish banking industry, the following empirical models will be utilized.

Model 1:

$$LOANGR_{it=}\gamma LOANGR_{it-1} + x'_{it-1}\beta + y'_t\theta + \mu SS_{it} + \pi FOR_{it} + z'_{it-1}SS_{it} + \alpha_i + \varepsilon_{it}$$

Model 2:

$$LOANGR_{it} = \gamma LOANGR_{it-1} + x'_{it-1}\beta + y'_t\theta + \mu SS_{it} + \pi FOR_{it} + \omega CRS_{it} + z'_{it-1}SS_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

Two models differ in terms of CRS variable that Model 1 considers only the sudden stop periods whereas Model 2 also controls the impact of global financial crisis. In this equation, $LOANGR_{it}$ indicates the loan growth of the ith bank in period t, x_{it-1} is the vector of lagged bank-specific variables, y_t is the vector of macroeconomic variables, SS_{it} is the sudden stop dummy and FOR_{it} is the dummy for foreign ownership, CRS_{it} is the dummy variable to control the impact of recent global financial crisis; z_{it-1} is the vector of bank-specific variables to interact with the sudden stop dummy, α_i denotes set of bank-specific fixed-effects that capture time-invariant influences and ε_{it} is an error term with $E(\varepsilon_{it}) = 0$.

The loan growth in the current period may trigger further growth of loans in the next period. To take into account the possible persistent behavior of bank lending, one lagged dependent variable is included in the model. A positive and significant coefficient for this variable will provide evidence towards persistence. The vector of bank specific variables includes bank size, liquidity, capitalization and deposit ratio. Following the similar literature, these variables are included with one lag to overcome a possible endogeniety problem (see for example Brei, 2007: 32)[5]. Size is an important factor that affects the bank behavior. To represent bank size natural logarithm of total assets is included. In conformity with the existing literature a direct link between bank-specific liquidity and loan growth is expected (see for example, Brei, 2007: 30; Alper *et al.*, 2012: 6). Capitalization is another variable which is frequently used to explain the bank lending behavior. One view asserts that bank loans and assets are negatively affected from higher capital requirements while another view argues that the negative effect does not exist in long run (Admati *et al.* 2011: 42, Kashyap *et al.* 2010: 12). The last argument of the vector x_{it-1} is deposit-to-asset ratio to control the impact of volume of deposits on the ability of banks to boost their lending potential.

It is well known that macroeconomic environment has important implications in lending behavior of the banking industry. Particulary, in bank-based emerging economies, banking industry is a mirror image of the macroeconomic development. To control the impact of the macroeconomic environment, real GDP growth, real interest rate and Greenspan-Guidotti ratio are included in vector y_t. Stronger economic growth may lead to higher demand and supply of bank loans whereas contractionary monetary policy and higher interest rates imply lower credit opportunities, theoretically. The last argument of the vector y_t is the Greenspan-Guidotti ratio to control the impact of increasing international reserves of Turkish economy on the lending decisons of the banks. Turkey, being one of the most fragile of the emerging market economies, has been accumulating a substantial amount of international reserves due to its critically high current account deficit and external debt. In order to grasp the possible effect of the increasing precautionary reserve holdings on the Turkish banking industry, a conventional measure indicating the sufficiency of international reserves namely the Greenspan-Guidotti ratio is included in the model. A negative and significant coefficient of this variable will set forth the contractionary impact of the excessive amount of precautionary reserve holdings of the monetary authorities in the Turkish economy on the loan growth of the banking system; whereas a positive coefficient implies that international reserve accumulation has served as a guarantee for the banking system to avoid negative effects macroeconomic imbalances.

Three dummy variables are included in the model; one for the sudden stop periods (SS), as defined in Table 3, one to control the impact of foreign ownership in the banking industry (FOR) and another one to control the impact of global financial crisis. The vector z_{it-1} includes the one lagged values of the variables indicating liquidity, capitalization and deposit volume. These are interacting with the SS dummy to answer the questions addressed in this study: whether higher liquidity or higher capitalization or higher deposit volume create differences in the lending behavior of banks over the sudden stop periods.

2.2. Methodology

The model defined in Equation 1 includes a lagged value of the dependent variable. This implies a dynamic relationship. Static panel data estimators do not take into account the serial correlation, heteroscedasticity and endogeneity problems that may occur in dynamic models. The early steps towards building up new estimators and overcoming the potential problems were taken by Andersen and Hsiao (1981: 600-605; 1982: 600-606), Griliches and Hausman (1986: 94-97), Holtz-Eakin *et al*. (1988: 1374). These instrumental variables techniques have been criticized since they could only provide consistent but not efficient estimates. The significant contribution to develop a consistent and efficient estimator for dynamic panel data (DPD) models was made by Arellano and Bond (1991: 277-297). They developed the dynamic Generalized Method of Moments (GMM) method which rests on using lagged levels of endogeneous varaiables and strictly exogeneous variables as instruments. Since Arellano-Bond (1991: 277-297) estimation method is based on first differencing of the regression equation, it controls the potential violations of orthogonality. They argued that the estimators obtained through the DGMM method are also efficient since this method is based on using additional instruments (lagged values of the dependent variables and other explanatory variables) which satisfy the orthogonality conditions. However, Blundell and Bond (1998: 118-127) criticized the first-differenced DPD estimator to have poor finite sample properties when series are persistent. To solve this problem, recently, Arellano and Bover (1995: 31-43) and Blundell and Bond (1998: 118-132) offered a system GMM method in which a system of first-differenced GMM and the level equations are estimated. Blundell and Bond (1998: 129-135) and Blundell *et al*. (2000: 21-25), using Monte Carlo methodology, indicate that the system GMM estimator produces more efficient estimates for finite samples. There are two important diagnostics for the GMM estimation. First, the assumption of no correlation between the error term and the instruments can be tested by Sargan test of overidentifying restrictions. This test has a χ^2 distribution with j-k degrees of freedom, where j is the

number of instruments and k is the number of endogenous variables. The other diagnostic is checking whether differenced residuals exhibit significant second order autocorrelation, i.e. AR(2). In case of second order autocorrelation, it will not be appropriate to use the second lags of endogeneous variables for their current values.

2.3. Estimation Results

The estimation results are reported in Table 4. Column for Model 1 indicates the estimation results ignoring the direct the impact of global financial crisis whereas column 2 provides results taking into account the crisis[6].

The system GMM estimation should be scrupulously detected to achieve reliable findings and rest the policy implications on it. To this end, Sargan test of overidentifying restrictions are reported. In both models, test statistics confirm that the instrument sets are valid. The other important disagnostic checks for the existence of autocorrelation in the residuals. The Arellano-Bond test for AR(1) implies existence of first-order autocorrelation whereas Arellano-Bond test for AR(2) implies that there is no second order autocorrelation. These two diagnostic test results imply that the instruments used in the estimation of the system GMM models are valid and one can rely on the estimates[7]. Finally, F-statistics for both models indicate that these regressions are overall significant.

Table 4. Sudden Stops, International Reserves and Bank Loan Growth

Dependent Variable: LOANGR	Model 1	Model 2
Lagged dependent	0.748*	0.743*
	(0.018)	(0.018)
SIZE	0.142*	0.151*
	(0.018)	(0.035)
LIQ	0.001	0.001
	(0.001)	(0.002)
CAP	0.004**	0.005**
	(0.002)	(0.002)
DEPTA	0.020**	0.06**
	(0.009)	(0.09)
REALGR	0.085*	0.080*
	(0.002)	(0.002)
REALR	-0.011*	-0.017*
	(0.002)	(0.002)
FOR	-0.347*	-1.034*
	(0.119)	(0.119)
GGRATIO	0.097*	0.084*
	(0.025)	(0.025)
SS	-0.255**	-0.259***
	(0.025)	(0.146)
CRS		-0.117*
	-	(0.037)
Interaction Variables		
SSLIQ	0.008**	0.004*
	(0.002)	(0.002)
SSCAP	-0.017*	-0.012*
	(0.002)	(0.002)
SSDEPTA	0.013*	0.026**
	(0.002)	(0.012)
SSGG	0.015**	0.051*
	(0.005)	(0.025)
Constant	1.043*	1.176*
	(0.264)	(0.265)
Sargan test (p-value)	29.245	27.471
	(1.000)	(1.000)
Arellano–Bond test for AR(1)	$Prob > z = 0.08$	$Prob > z = 0.121$
Arellano–Bond test for AR(2)	$Prob > z = 0.96$	$Prob > z = 0.997$
F-statistic	8471.25*	7547.76*
Number of observations	1172	1172

Note: The numbers in parentheses denote the standard errors. *, **, *** indicate significance at 1, 5, and 10 percent levels, respectively.

At one glance, some striking results attract the attention. First, the estimated coefficients on lagged dependent variable in both models are positive and significant. This is in conformity with our prior expectatation comprising the persistent characteristic of bank loan growth. The coefficient on the bank size is positive and significant in both models. It is important to bear in mind that one lagged value of the bank-specific variables are used in the regression to avoid the endogeneity problems. The postive coefficient implies that larger banks have experienced greater credit growth

over the sample period relative to the smaller banks. Asset liquidity does not have a significant effect on the loan growth over the sample period. Higher bank capitalization enables banks to easily fulfill their minimum capital adequecy requirements. The coefficient on the variable CAP is positive and significant, indicating that banks with higher capital ratios have concentrated on their lending activities. It is well known that deposits are one of the main sources of funding for the banks. The positive and significant coefficient on the ratio of deposits to total assets variable (DEPTA) supports this expectation, in both models.

There are also salient features of the findings related to the impact of macroeconomic environment on bank loan growth. In conformity with the literature, a positive and significant effect of real growth of economy on bank lending implies that economic development boosts the banking activites. Banks release the credit opportunities in times of economic growth. The real interest rate is a variable controlling the state of monetary policy. The negative and significant coefficient is in conformity with our prior theoretical expectations.

The average growth rate of loans to assets ratio in the Turkish banking industry, over the sample period, has been 8.45% whereas the same ratio for the foreign banks has been 7.68%[8]. The negative and significant coefficient estimates for the FOR variable imply this lower performance of foreign banks relative to the domestic banks. The foreign reserve accumulation may serve as a cushion against economic imbalances and hence provide a guarantee for loan growth in the banking industry. The positive and significant coefficients of GGRATIO variable in both models are in line with this expectation. Another striking feature of the findings is about the impact of sudden stops on the bank lending behavior. The negative and significant coefficient of SS variable implies that banks have reacted by contracting the loan suply over the sudden stop periods. This finding is an evidence for the foreign capital dependence of the Turkish economy and banking system and it is in line with the findings of Brei (2007: 33) and Togan and Berument (2011: 11). Model 2 has an extra variable, CRS, controlling the impact of global financial crisis on bank lending. The positive and significant coefficient of CRS indicates that, Turkish banking industry has experienced significant loan growth following increase in international capital flows after the global financial crisis. The coefficient estimates on the interaction variables embody the answer to the main research questions of this paper. First, the estimated coefficients of the variable SSGG in both models are positive and significant. This implies that over the sudden stop periods, the international reserve holdings of the Central Bank facilitates the banking system to increase the loan supply. This finding is not surprising since over the

last two decades emerging market economies have been intensively accumulating foreign reserves since reserves are useful in preventing and mitigating crisis (Jeanne, 2007). The other research question of this study finds an answer on the estimated coefficient of SSLIQ. This variable has significant positive effect on the loan growth of the banks. Despite the insignificant impact of liquidity on the bank lending, the significant interaction variable implies that it is important to have higher liquidity over the sudden stop periods. The more liquid a bank, the easier it will adapt to the ongoing imbalance and in turn loosen the credit opportunities. However, one can observe the opposite finding for the highly capitalized banks. Higher capitalization ratio refrains the banks from increasing credit supply over the sudden stop periods. As mentioned before, highly capitalized banks may not be adversely affected from the sudden stop of capital since capitalization may imply lower risk for banks. However, according to another view, high capitalization captures the loan opportunities which may be reflected as reduction in bank lending over the sudden stop periods. This finding should be considered together with the outcomes of Basel standards. Turkish banking system has an average capital adequecy ratio of 15.6 percent by the third quarter of 2013 (Turkish Banking Association, 2013). This is significantly over the required level. Hence, excessive capital holdings may prevent banks from performing one of their main functions of suplying loans.

The positive and significant coefficient on the SSDEPTA variable provides an answer to the last question researched in this paper. During turbulent times, the banks with higher deposit ratio will experience higher loan growth rates.. This implies that banks should give extreme importance to drawing deposits over the tranquil times to make use of them in credit supply.

In summary, focusing on the 2003-2013 period, the findings of this study imply that sudden stop of capital inflows to Turkish economy has a significant negative effect on the loan growth rate of the banking industry. High external debt stock, import demand and chronically high current account balance have led the authorities accumulate substantial amount of international reserves. This accumulation became significant particularly following the recent global financial crisis, namely 2008. Hence, these reserves have served as an insurance towards potential volatilities and imbalances in the economic variables periods which supported the loan growth over the sudden stop periods. The other important findings shed light on the differences in the behavior of well-capitalized banks, high-liquidity banks and banks with high deposit ratios over the sudden stop periods in terms of loan growth. Both higher liquidity and higher deposit

ratios are associated with higher loan growth over the sudden stops whereas higher capitalization ratio supresses loan growth.

CONCLUSIONS

Capital flows to and away from the emerging market economies have become one of the concerns of the policymakers, recently. Turkey is one of these countries with low savings rate, high current account deficit and increasing external debt. Turkish economy has become apparently dependent on foreign capital to finance economic growth and assure economic stability over the last decade. However, this dependency inflicts significant costs on the economy. The economy becomes extra-sensitive to global imbalances which translates into fragility. A sudden stop of capital inflows may trigger a domino effect which would affect the financial and real economy, eventually.

Capital flows have a close link to the banking system. Banks tend to increase their supply of loans in periods of capital inflow whereas capital reversals supress their willingness to lend. Banking system is not only a financial intermediation channel in the Turkish economy but also one of the main actors of the economic arena. The rapid growth of bank loans parallel to the increase in capital inflows explain the dependence of Turkish banking system to external sources. To this end, it is worth analyzing the implications of sudden stops of capital for the banking system in terms of bank loans. To this end, sudden stop periods are determined according to the criteria offered by Frankel and Cavallo (2004: 7) and Calvo *et al.* (2004: 14). Against the risk of sudden capital reversals and economic imbalances, emerging market economies have been accumulating important level of international reserves. These reserves may serve as an insurance for the financial system to sustain its activites over the turbulent periods. Hence, the accumulation of foreign reserves may have important implications on the lending decisions of banks.

This paper contributes to the existing literature by analyzing the impact of sudden stops and international reserve accumulation on the bank lending. The implications of accumulating international reserves are analyzed in two parts; first the direct effect on the loan growth and second, the effect on loan growth over the sudden stop periods. Greenspan-Guidotti ratio is emploed as a proxy for international reserve accumulation. Furthermore, this paper searches answer to questions whether loan growth of liquid, highly capitalized and high-deposit volume banks differs during sudden stop periods. This paper incorporates a set of bank-specific and macroeconomic variables into the model. The sample covers the 2003q1: 2013q3 and system GMM

methodology is used to explore the impact of sudden stops and international reserves on bank lending.

The results reveal that sudden stop of capital into Turkey has resulted in significant decline in bank lending. It is also striking to find that higher international reserve holdings over the sudden stop periods have translated into higher growth in bank loans. This result contributes to the recently growing literature on the consequences of increasing reserve holdings in the emerging markets. Our findings are in line with the precautionary view that international reserves serve as an insurance against the economic imbalance created by sudden capital flow reversals. Hence the higher are the reserve holdings of the economy, the more confident banks feel to grow lending over the sudden stop periods. This result has important policy implications for the economic recovery. The authorities should give extreme emphasis on the accumulation and management of international reserves. Moreover, the results provide evidence that higher liquidity and higher deposit volume increase the bank lending over the sudden stop periods. However, higher capitalization tends to result in lower loan growth over the turbulent times. The capital adequecy ratio of the Turkish banks, on the average, are higher that the required level. Despite the advantage of lowering the riskiness of banks, high capitilization may prevent banks from supplying loans efficently.

The persistent characteristic of growth of bank loans is another finding of this study. Among the set of bank-specific variables, bank size, capitalization and deposit ratio have significant impact on the loan growth. The findings further reveal that, over the sample period foreign banks have lower performance in loan growth relative to domestic banks. Moreover, following the global financial crisis, liquidity flows into the emerging economies have increased dramatically. Turkish banking industry, making use of these flows, have experienced higher demand for loans over the post-crisis period. This is also evident in the findings of this paper, when the global financial crisis is controlled. The economic expansion periods are associated with increase in bank loans in the Turkish economy over the sample period.

Overall, this paper concludes that lending behavior of banks and capital flows to the Turkish economy are closely related with each other. Hence, bank lending is significantly negatively affected over the sudden stop periods. Moreover the international reserve holdings of the economy act as a stabilizer in times of sudden capital flow reversals and encourage banks to release their funds as loans. These results may shed light on the decisions of policy makers in emerging market economies. The

authorities in similar countries may adopt precautionary measures against the fragility to be created from possible sudden stops and use international reserves as a buffer to prevent contraction in bank credit over turbulent times.

NOTES

[1] Based on the information from "Liberalizing Capital Movements: Some Analytical Issues", (1999) by Barry Eichengreen, Michael Mussa, Giovanni Dell'Ariccia, Enrica Detragiache, Gian Maria Milesi-Ferretti, Andrew Tweedie, IMF Economic Issues, No. 17.

[2] CBRT EDDS abbreviates Central Bank of the Republic of Turkey Electronic Data Dissemination System.

[3] This ratio is first mentioned by Pablo Guidotti and Alan Greenspan in 1999, separately.

[4] Some papers use financial account surplus as a proxy for capital flows (see for example Frankel and Cavallo, 2004:7; Gibson *et al*., 2006:15; Brei 2007:36; Joyce and Nabar, 2009:317) whereas some use the difference between trade balance and changes in international reserves. (see for example Calvo *et al*., 2004:15). To ensure robustness, sudden stop periods are determined also by using the alternative proxies. The findings do not change significantly. The results are available from the author upon request.

[5] Bank size, liquidity, capitalization and deposit ratio may affect loan growth however, the reverse effect is also anticipated in the way that loan growth may result in more assets, higher liquidity, capitalization and deposit ratio.

[6] CRS variable is not included in model 1, however Sudden Stop dummy variable indirectly controls the impact of global financial crisis.

[7] Interaction terms are established by the interaction of one-lagged values of bank-specific variables and the GGRATIO. Keeping in mind that the instrumental variables should be correlated with the endogeneous variables and orthogonal to the error term, we have chosen GGRATIO, REALGR, lagged values of DEPTA and CAP as the instruments.

[8] Source: Various publications of Turkish Banking Association: "Banks in Turkey", issues 2013, 2012, 2011, 2010, 2009, 2008 and "50th Anniversary of the Banks Association of Turkey and Banking System, 1958-2007".

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