EXTERNAL FINANCIAL STRESS AND EXTERNAL FINANCING VULNERABILITY IN TURKEY: SOME POLICY IMPLICATIONS FOR FINANCIAL STABILITY

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ABSTRACT External financial stress is one of the causes of capital outflows and reduction in borrowing ability of emerging markets. Sudden reversal of capital inflows and disruption in access to the international capital markets could be threat for the domestic financial stability as in the case of Asian Crisis in 1997-1998. This paper analyses the behavior of external financing sources of Turkey, namely FX non-core liabilities of the banking system and portfolio flows, for periods of 1995-2000 and 2004-2012. Our results show that unlike the 1995-2000 period, FX non-core liabilities of the banking system are very sensitive to the external financial stress during the 2004-2012 period. Portfolio flows decline in both cases but with a higher magnitude in the second period. Our results have important policy implications.
JEL F21, F41, G21
Keywords Financial stability, Financial flows, FX non-core liabilities, VIX, Turkish banking sector

ÖZ Gelişmekte olan ülkelerden sermaye çıkışlarının ve bu ülkelerin borçlanma kabiliyetlerindeki azalışın sebeplerinden biri yurt dışındaki finansal piyasalarda oluşan strestir. 1997–1998 Asya krizinde olduğu gibi, sermaye girişlerindeki ani tersine dönüşler ve uluslararası sermaye piyasalarından borçlanmanın zorlaşması ülke içi finansal istikrarı tehdit edebilmektedir. Bu çalışma 1995–2000 ve 2004–2012 dönemlerinde Türkiye'nin yurt dışı finansman kaynaklarının, diğer bir ifadeyle bankacılık sisteminin döviz cinsi çekirdek olmayan yükümlülüklerinin ve portföy akımlarının, yurt dışında yaşanan finansal stres dönemlerinde nasıl davrandığını incelemektedir. Elde ettiğimiz sonuçlar bankacılık sisteminin döviz cinsi çekirdek olmayan yükümlülüklerinin 2004–2012 döneminde, 1995–2000 dönemine göre yurt dışı finansal piyasalarda yaşanan strese daha fazla tepki verdiğini göstermektedir. Portföy akımları, 2004–2012 döneminde daha fazla olmak üzere her iki dönemde de yurt dışı finansal stres sonrası azalmaktadır. Bulunan sonuçlar önemli politika çıkarımları sağlamaktadır.
YURT DIŞI FİNANSAL STRES VE DIŞ FİNANSMAN KIRILGANLIĞI: FİNANSAL İSTİKRAR İÇİN BAZI POLİTİKA ÇIKARIMLARI
JEL F21, F41, G21
Anahtar Kelimeler Finansal istikrar, Finansal akımlar, Döviz cinsi çekirdek olmayan yükümlülükler, VIX, Türk bankacılık sistemi

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1. Introduction

The recent economic crisis has once again proved that external shocks are one of the main sources of financial and macroeconomic fluctuations in small open economies. As stated by Schmukler (2004), while these economies' growing integration with the world economy makes them more prosperous, it also makes them more vulnerable to external shocks. Since these economies are integrated with the world economy through financial and trade channels, an external shock can transmit to these countries through either or both of these channels. Eichengreen and Rose (1999), Glick and Rose (1999), Forbes (2001) investigate the role of the trade channel in the transmission of external shocks. The early literature on the transmission of external shocks through financial channel includes Caramazza et al. (2000), Kaminsky and Reinhart (2003), Rigobon (2000 and 2001). Canova (2005) shows that the financial channel is important for the transmission of US shocks to Latin American countries.

As indicated by the IMF (2007), tighter external financing conditions play an important role in financial crisis and output volatility in 1990's (i.e. Latin American Crises and Asian Crisis). Balakrishnan et al. (2009) also show that pre 2008 financial stresses in advanced economies caused large and persistent capital outflows from the emerging economies. The transmission of these adverse external shocks is mainly through the reversal of portfolio inflows and/or a failure of the rollover of foreign loans both by the banking and by the real sectors. For example, as Kaminsky et al. (2001) show, external shocks, like the failure of Long Term Capital Management (LTCM) in 1998, may cause significant capital outflows from emerging markets. [1] However, significant capital outflows do not necessarily lead to a financial crisis. Park and Song (2001) argue that 1997 Financial Crisis in Korea was not sparked by the portfolio outflows but the failure of the banking system to roll over its foreign debt. Evidently, sudden confidence deterioration leads to capital outflows and deleveraging. These developments obviously put the domestic currency under pressure. A depreciation of domestic currency inflates the foreign currency liabilities of domestic agents, which eventually increases the possibility of bankruptcies in the real sector. An increase in non-performing loans in the domestic market together with difficulties in rolling over its foreign liabilities puts the balance sheet of the banking system under extreme pressure and eventually leads to bank failures. Therefore, Hahm et al. (2012)

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[1] For the effects of the failure of LTCM on Brazil, see Baig and Goldfajn (2001).

suggest that foreign borrowing of banks[2] (henceforth FX non-core liabilities of banks) should be closely monitored by the authorities as it could lead to a sudden deterioration in the balance sheet of banks. In other words, accumulation of FX non-core liabilities is an important thread for domestic financial stability.

In this paper, we try to understand how external financing sources of Turkey behave during a financial stress abroad. This question is important because, as mentioned above, behavior of external financing sources is a crucial factor for maintaining domestic financial stability during turbulent times. We use FX non-core liabilities of the banking sector and net equity and bond portfolio inflows as external financing sources of Turkey because these variables are the main financing sources of the current account deficit[3] (Figure 1.a). Figure 1.b shows that FX non-core liabilities of the Turkish Banking system have been increasing over time. The share of FX non-core liabilities in total assets is very volatile and about 8 percent on average in the sample period. On the other hand, net portfolio inflows are increasing and more importantly, financing the important part of the current account deficit of the Turkish economy (Figure 1.b). This feature makes the behavior of portfolio inflows in the face of a foreign stress more important. Because sudden portfolio outflows not only put the balance sheet of the financial system at jeopardy but also could lead to a sharp fall in economic activity as in 1994, 2001 and 2008. As a proxy for external financial stress, we use the CBOE Volatility Index (VIX), which is perceived as a key measure of market expectations of near-term volatility conveyed by the S&P 500 stock index option prices.[4]

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[2] The core funding available to the banking sector is the deposits of domestic savers, which grow in line with the aggregate wealth of the nation. In a lending boom, when credit is growing very rapidly, the pool of retail deposits is not sufficient to fund the increase in bank credit. Other sources of funding, or named as non-core liabilities, are employed to fund rapidly increasing bank lending (Hahm, et.al. 2012). In this paper, we focus on the non-core liabilities of the banking system denominated in foreign currency.

[3] We are aware of the fact that real sector credits are also important for financing current account deficit, however, due to lack of data for the first sub-period, we could not include the real sectors' borrowings from abroad.

[4] There are other proxy candidates for external financial stress, such as CDS, EMBI or LIBOR-OIS. Due to data availability, however, we use VIX.

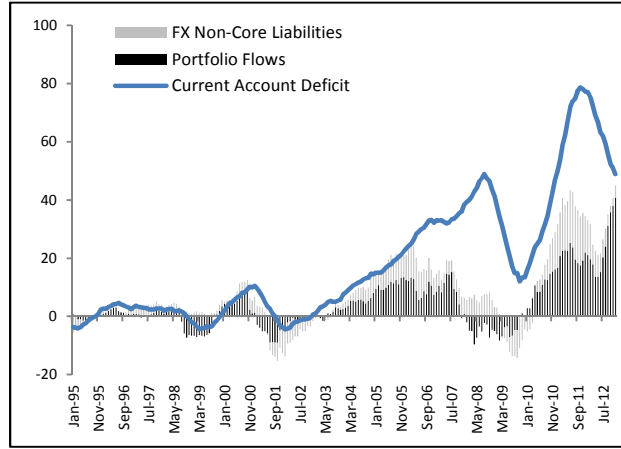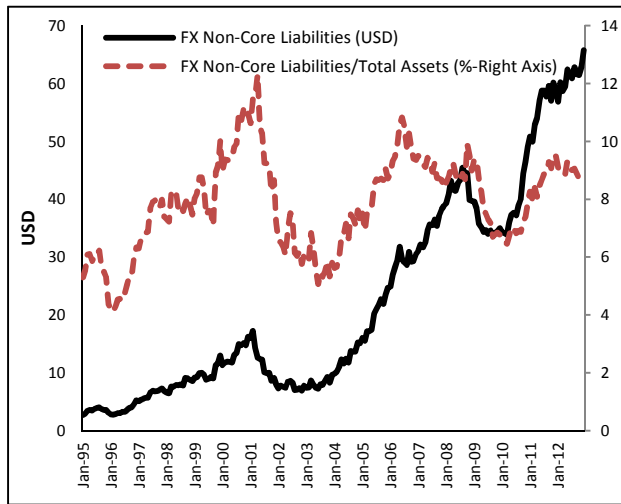**Figure 1.a. Current Account Deficit, Bank Loans, and Portfolio Flows**

Figure 1.b. FX Non-Core Liabilities of the Turkish Banking System

In our analysis, we estimate a Vector Auto Regression (VAR) model for two different periods. The first period, from 1995 to 2000, includes Asian financial crisis in 1997 and Russian default in 1998. The second period covers years from 2004 to 2012 and includes recent global financial crisis.[5] By dividing the sample into two periods, we are able to analyze how the behavior of external resources changes in the aftermath of the restructuring of the

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[5] We exclude the period of domestic financial crisis and the domestic restructuring period afterwards (November 2000-December 2003).

Turkish economy after the 2001 financial crisis. In our estimations, we use a block-exogenous VAR so that foreign variables affect the domestic variables contemporaneously but domestic variables do not affect foreign ones both contemporaneously and in a lagged structure.

Our results suggest that behavior of the FX non-core liabilities of the banking system has changed in the last decade. While FX non-core liabilities of banks do not give a significant response to external financial stress during 1990s, it becomes very sensitive to external financial stress in 2000s. We observe immediate portfolio outflows in both periods after an external financial stress. However, its magnitude is higher in the second period. In other words, financial channel of the transmission of external financial shocks has been more powerful in the last decade. In addition, elasticity of FX non-core liabilities to domestic economic activity has increased in last decade. From the financial stability point of view these developments are important and accumulation of excessive FX non-core liabilities could potentially increase the severity of the shocks to external financial stress in Turkey and hence it should be monitored closely.

The paper is organized as follows. In Section 2, we report data descriptions and sources, and then we explain the VAR methodology and results. In Section 3, we discuss some policy implications of our results. Section four concludes.

2. Data and Empirical Results

2.1. Data

The data covers monthly observation for the period of January 1995 – August 2012. However, we divide our sample into two parts due to significant structural change in the Turkish economy after the 2001 crisis. We consider the 2000m11-2003m12 period as the crisis and normalization period, hence, omitted from the sample. We use monthly data because first, variables, except for VIX, have a monthly frequency and second, frequency of less than one month may cause the loss of the short-term information in the data. We chose VIX as a proxy for financial stress in the global economy and data are collected from Bloomberg. FX non-core liabilities comprise only the credits obtained from foreign banks and other foreign institutions. Portfolio inflows are measured as non-resident's holdings of securities (government bonds and equities) that is net of exchange rate effect and price changes. FX non-core liabilities of the banks and portfolio flows are denominated in US dollar and collected from the CBRT's web page. We use monthly percentage change of variables in estimations. In addition, impulse dummies are used to handle the jumps in the variables during stress times.

2.2. VAR Analysis

2.2.1. Identification Strategy

Considering Turkey is a small open economy, we identify the VAR model so that foreign shocks affect the domestic variables but domestic shocks do not affect foreign ones both contemporaneously and in a lagged structure. Following Cushman and Zha (1997) we impose block exogeneity in the following VAR model:

$$\sum_{k=0}^{p} \begin{bmatrix} A_{11}(k) & 0 \\ A_{21}(k) & A_{22}(k) \end{bmatrix} \begin{bmatrix} Z_{k-1} \\ X_{k-1} \end{bmatrix} = \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \end{bmatrix}$$

where $A_{1j}(k)$, i,j=1,2 is coefficient matrix, $[Z_t \; X_t]'$ is observation vector and $\varepsilon_t = [\varepsilon_{1,t} \; \varepsilon_{2,t}]'$ represents the structural disturbances vector. We assume that coefficient matrix for k=0 is non-singular and ε_t is uncorrelated with lagged coefficients for k>0, and satisfies the following conditions:

$$E\left[\varepsilon_t \varepsilon_t' \middle| y_{t-k}, k > 0\right] = I \text{ and } E\left[\varepsilon_t \middle| y_{t-k}, k > 0\right] = 0$$

We impose block exogeneity by assuming $A_{1,2}(k) = 0$. This assumption ensures that Z_{t-1} is exogenous to X_{t-1} simultaneously and in lagged structure.

In our VAR model, matrix Z_t consists of VIX and X_t consists of FX non-core liabilities of the Turkish banking system and portfolio flows. Due to our small open economy assumption while VIX affects both FX non-core liabilities of the banking system and portfolio flows contemporaneously and with lags, domestic variables should not have any effect on the VIX. Therefore, we impose the necessary restrictions in a structural VAR to ensure this relationship.

All information criteria suggest one lag. However, one lag does not remove autocorrelation in errors. Therefore, we selected the lag-length as 2 for both periods. Generalized least squares method is used in the estimation process.

2.3. Impulse-Response Analysis

We report the effects of an increase in VIX in Figure 2 for the 1995m1 to 2000m10 period. The solid line shows the average responses and dotted lines show the 95 per cent confidence bands. Confidence bands are computed by doing 10000 bootstrap replications, which is much more convenient and reliable for the small sample data (Lutkepohl, 2004).

Our results show that an increase in VIX causes an immediate portfolio outflow and outflow continues in the consecutive month. After an increase in

VIX, FX non-core liabilities of the banking system do not show a statistically significant response in this period.

Figure 3 shows the responses of variables for the period of 2004m1 to 2012m8. Portfolio investments decline again in response to a rise in VIX, but the magnitude is much higher than the previous case. In contrast with the first case FX non-core liabilities of the banking system decline significantly in the consecutive month of the shock and this effect continues in the next month.

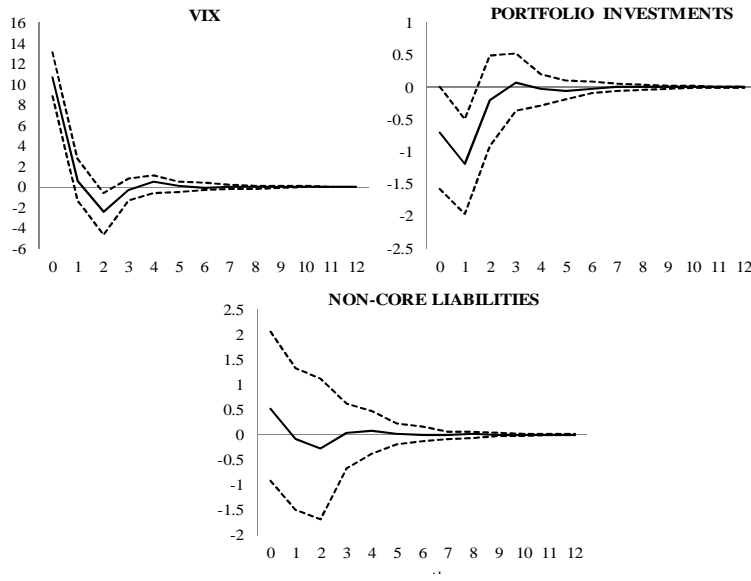**Figure 2. Dynamic Responses to a Positive VIX Shock for the Period 1995M1-2000M10**
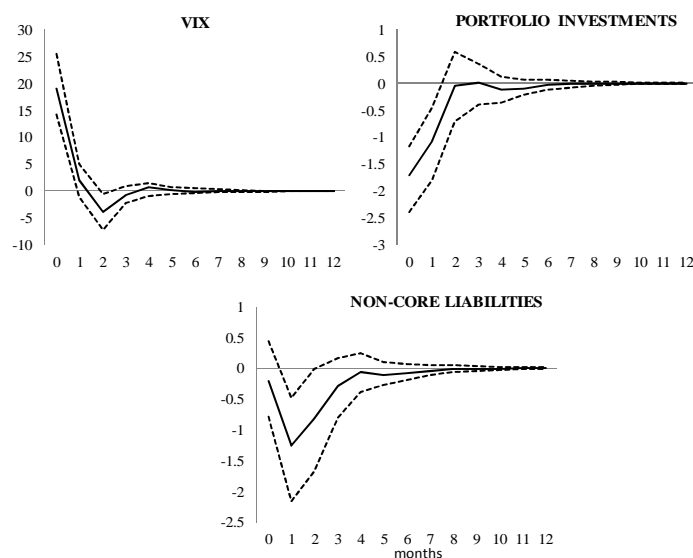
Figure 3. Dynamic Responses to a Positive VIX Shock for the Period 2004M1-2012M8

3. Interaction between FX Non-core Liabilities and Economic Activity: Some Policy Implications for Financial Stability

As VAR results in previous section show, sensitivity of the FX non-core liabilities of the Turkish banking system to a financial stress abroad has increased in the last decade. These results could be one of the consequences of the structural change in the Turkish economy after the 2001 financial crisis. Before 2001, there was an implicit foreign exchange rate peg guarantee of the government.[6] This eliminates the currency risk in foreign borrowing of the domestic banks, hence kept their appetite for the foreign currency loans alive as long as they have access to the international capital markets. In addition, as Bildirici and Ersin (2005) documented, the effect of fiscal dominance on the Turkish economy has increased starting from 1980. This effect has reached its peak during the 2001 financial crisis. Yörükoğlu and Kılınç (2012) indicate that budget deficits are mainly financed by the domestic banking sector in this period. Therefore, even during a financial stress abroad, demand of the banking sector for foreign loans has not declined. However, in the second period, fiscal dominance has disappeared and Turkish banks have been operating in a very competitive environment in which banks' demand for foreign loans have been sensitive to the domestic economic activity.[7]

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[6] Dooley (1997) shows that implicit FX rate guarantee boosts the borrowing in FX terms.

[7] For a detailed analysis of the Turkish banking sector, see Aydin and Igan (2010). Guo and Stepanyan (2011) study the determinants of bank lending in emerging economies before and after the global financial crisis.

In order to test our view we estimate Equation 1 following Hahm et al. (2012):

$$\ln(NC_t) = \beta_0 + \beta_1 \ln(GDP_t) + \xi_t \qquad (1)$$

where, NC_t is the FX non-core liabilities and GDP_t denotes gross domestic product. β_1 indicates the elasticity of the FX non-core liabilities to current and lagged GDP in respective regression analysis. The results (Table 1) show that GDP and FX non-core liabilities present a cyclical movement as the elasticity of FX non-core liabilities with respect to GDP is greater than 1.

Table 1. FX Non-core Liabilities

	Ln(NC$_t$)	
	1995-2000	2004–2012
Constant	-7.69***	-19.03***
	(-21.96)	*(-17.47)*
Ln(GDP)	1.25***	1.60***
	(60.80)	*(33.83)*
R^2	0.98	0.92

Notes: *t-stats in parenthesis; ***denotes 1% significance level.

This result has implications for domestic financial stability because FX non-core liabilities of the banking system have been more sensitive to external financial shocks. Therefore, even if domestic policy makers pursue sound macroeconomic policies, external financial shocks could lead to a sudden deterioration in domestic financial stability. Our findings provide evidence in favor of the macroprudential policy measures of the CBRT that aims to balance the risks faced by the Turkish economy.

4. Conclusion

In this paper, we analyze the behavior of external financing sources of Turkey against an external financial stress in two different periods. Our results show that after an increase in external financial stress, portfolio flows decline in both periods. The more striking result is the rising sensitivity of the FX non-core liabilities of the Turkish banking system to external financial stresses in the last decade. We also find that elasticity of FX non-core liabilities to domestic economic activity has increased. These results indicate that from the financial stability point of view, accumulation of FX non-core liabilities could potentially amplify the severity of the external financial stress shocks in Turkey and hence, should be monitored closely.

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