Cross-border portfolio flows and the role of macroprudential policies: experiences from Turkey

Salih Fendoğlu, Mustafa Kılınç and Mehmet Yörükoğlu[1]

Abstract

The last three decades have been marked by financial market globalisation and a higher degree of integration of emerging markets into the world economy. One distinct feature of this integration has been a sharp increase in portfolio flows between advanced and emerging market countries. Since the global financial crisis of 2008–09, these flows have become very sensitive to the monetary policy stance, interest rates and central bank balance sheets of advanced economies. Coupled with prevailing policy uncertainties, this has made global portfolio flows highly volatile, and accordingly has given rise to serious challenges for emerging market countries. To contain the potentially undesirable effects of these flows on their domestic real and financial cycles, emerging market countries have implemented a battery of macroprudential policies. Turkey has been proactive in devising an augmented policy framework to limit such undesirable effects, using policy tools such as reserve requirements, the Reserve Option Mechanism and the interest rate corridor. This note uses a cross-country data set covering 2005–12, and shows that the policy framework in Turkey has been effective in decreasing the sensitivity of portfolio flows to global risk factors.

Keywords: Portfolio flows, risk-taking channel, macroprudential policies, Turkey

JEL classification: E44; E52; E58

[1]   Central Bank of the Republic of Turkey (CBRT).

1. Introduction

Over the last three decades, financial markets have become increasingly globalised as emerging markets have integrated themselves into the world economy. Given this higher integration of the world's economies, spillovers among countries have also become important. Accordingly, news of a fiscal problem, of a change in the monetary policy stance or of a real slowdown in individual countries becomes a major event for the world economy as a whole. As a result, policymakers in each country need to take into account any positive or negative economic developments in the rest of the world when making their decisions.

One major consequence of the higher integration in the world economy has been an increase in financial flows between countries. One particular kind of financial flow that requires close attention is the portfolio flows from advanced economies to emerging economies. These flows are mostly considered to be short term in nature and highly sensitive to economic developments. Figure 1 shows portfolio flows of bonds and equities towards emerging economies. After the global financial crisis of 2008–09, portfolio flows became larger, and also remained highly volatile. Especially during this period of significant quantitative easing (QE) in advanced economies, financial markets were flooded with short-term liquidity, which induced strong flows towards emerging economies. However, these flows were also very sensitive to risk perception in the world economy. For example, as the fiscal problems in advanced economies intensified, these portfolio inflows quickly turned into outflows.

Portfolio flows to emerging economies (13-week moving average, USD billions)   Figure 1
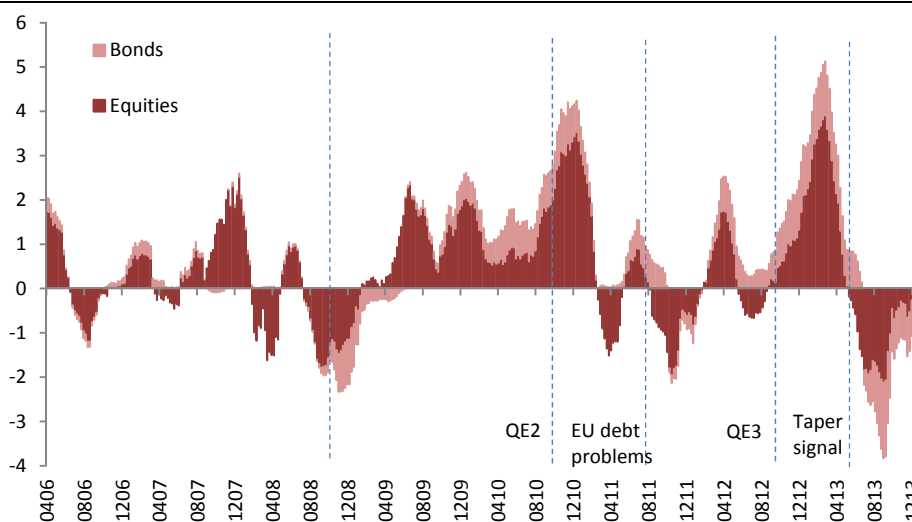
Source: EPFR.

So, as a result of financial integration, the global portfolio market can be considered to be a single market. In this market, global investors decide on the distribution of funds across countries depending on the associated risks and returns. Monetary policies and especially the QE policies of advanced economies have been important factors in this market. Due to the low interest rates and abundant liquidity provided by advanced economy central banks, investors searched for higher yields, creating a kind of risk-taking channel. Subsequently, emerging

economies with higher growth outcomes/prospects and higher nominal yields became preferable destinations for investors' portfolio flows. However, as the risks surrounding the fiscal policies, monetary policies and the pace of economic growth emerged, these flows behaved in a very volatile fashion.

Being on the receiving end of these volatile flows, policymakers in emerging economies devised and extensively used several tools to contain the possible adverse effects.[2] Turkey also devised a number of new tools, such as the interest rate corridor and the Reserve Option Mechanism (ROM). These tools were designed to smooth the effects of volatile capital flows on the economy and to contain any possible financial cycles.

Section 2 of this paper explains these tools and their effects on the capital flows into Turkey[3]. Section 3 constructs a large cross-country data set covering the period Q1 2005–Q4 2012 to test the hypothesis of the paper. First, it is shown that portfolio flows are sensitive to the risk perception in financial markets, as measured by the VIX. Also, this sensitivity has arguably increased since 2010. Subsequently, it is shown that emerging economies as well as Turkey have historically been more sensitive to fluctuations in international risk appetite. Finally, we show that the policy tools implemented in Turkey to contain the adverse effects of capital flows have led to a significant reduction in the sensitivity of portfolio flows to risk perception since 2010. Section 4 concludes.

2. Turkish experiences of the recent volatile capital flows

Turkey liberalised its trade account in the early 1980s, its financial account in the late 1980s and became a trade member of the European Union in the mid-1990s. As a result, the country has become a more open and integrated economy, but these developments have not been without significant challenges. Especially as regards capital flows, the country's financial liberalisation was followed by a number of difficult problems. For example, Turkey experienced two crises in 1994 and 2001 related to its capital account, although the main determinants of these crises were domestic in nature, such as fiscal sustainability issues and banking concerns. After the 2001 crisis, Turkey implemented significant reforms in several areas including the fiscal, monetary and banking domains. These reforms strengthened the country's fundamentals and supported its convergence with the advanced economies.

In the 2000s, with strong fundamentals and in the midst of its convergence process, Turkey was running current account deficits (Figure 2). Before the global financial crisis, a large portion of this current account deficit was financed by foreign direct investment and long-term flows (Figure 3). After the crisis, however, concerns grew as the current account deficit became excessive and the financing of the deficit shifted to mostly portfolio and short-term capital flows.

---

[2]   See IMF (2013a,b,c) for an overview of these policies.

[3]   For an overview of the CBRT's new policy framework, see Başçı and Kara (2011), and Alper, Kara and Yörükoğlu (2013).

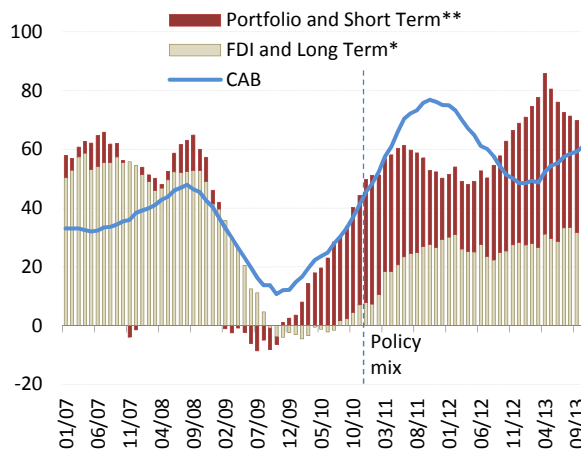Current account balance (CAB) (12-month cumulative, USD billions)   Figure 2
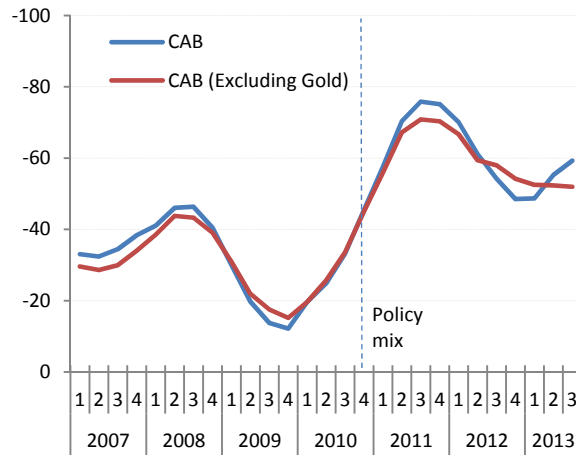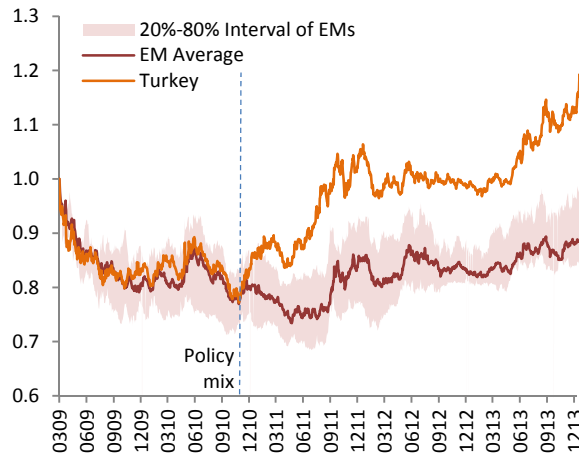

Source: CBRT.

Financing of current account balance (12-month cumulative, USD billions)   Figure 3
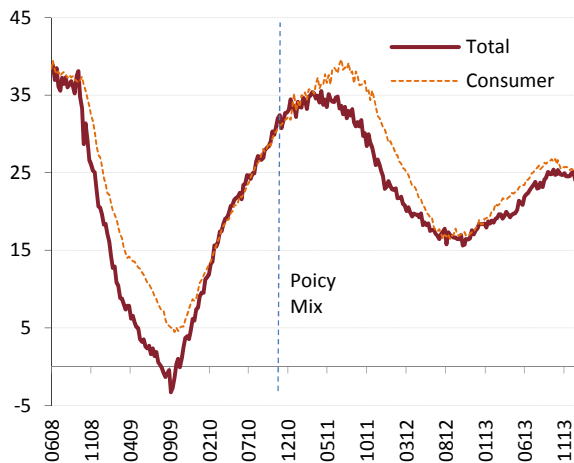

Source: CBRT.

Other concerns that emerged due to the strong inflows of portfolio and short-term capital were related to the exchange rate and credit growth. During this inflow period, the Turkish lira appreciated sharply but so did other emerging market currencies, indicating that the developments were not specific to Turkey, but more part of a global financial cycle (Figure 4). Additionally, credit growth in Turkey reached around 35% (Figure 5). This high level of credit growth along with an overvalued currency and strong portfolio flows were potential symptoms of a nascent financial boom. Therefore, the CBRT devised a new policy mix to contain the possible adverse effects of this financial cycle.

Turkish lira and other EM currencies versus the USD (9 March 2009=1)   Figure 4

Source: CBRT, Bloomberg.

Growth rates in total and consumer loans (adjusted for the exchange rate
effect, annual change, per cent)   Figure 5

Source: BRSA, CBRT.

In its policy mix, the CBRT used two new tools: the interest rate corridor and the
Reserve Option Mechanism (ROM). In pursuit of the interest rate corridor policy, the
central bank overnight borrowing rates were lowered significantly while the lending
rates were stable at the end of 2010 (Figure 6). In addition, the CBRT allowed its
overnight repo rates to fluctuate within this asymmetric corridor, creating a
downward bias in short-term interest rates. In effect, this policy reduced the risk-
adjusted return for foreign investors by increasing the volatility of the returns. This
policy succeeded in limiting some portfolio and short-term capital flows. Moreover,
the CBRT increased its reserve requirement ratios significantly and terminated the
remuneration on those reserves.

Interest rate corridor (per cent)

Figure 6
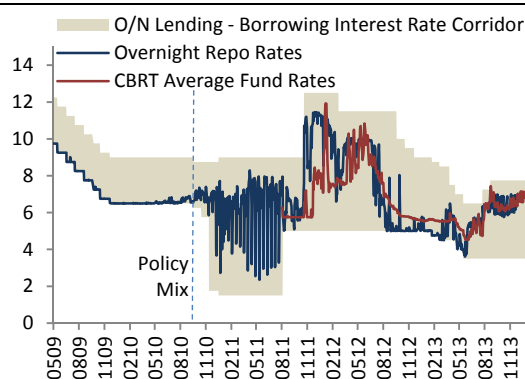
Source: CBRT.

As a result of these policies, the Turkish lira immediately started to depreciate at the end of 2010, while credit growth and the share of short-term flows in the financing of the current account started to decrease in 2011. Following the onset of the European debt problems in the third quarter of 2011, the Turkish lira depreciated further. This time, to contain the volatility in exchange rates, the CBRT shifted the asymmetry of the interest rate corridor upwards by increasing the lending rate. This upward-biased interest rate corridor basically increased the risk-adjusted return for foreign investors. However, this policy also created a funding rate risk for domestic banks at a time of still-high credit growth. Later on, when euro area concerns eased, the width and asymmetry of the corridor decreased.

FX reserve option coefficients in Reserve Option Mechanism (ROM)
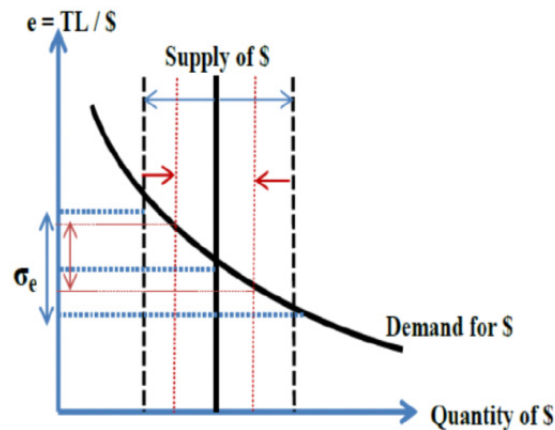
Figure 7
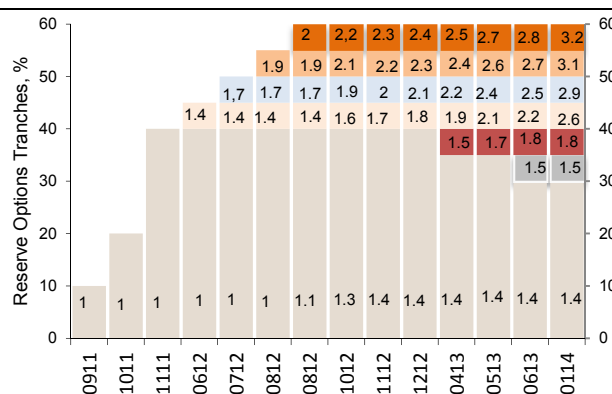
Source: CBRT.

The second tool, which was devised at the end of 2011 and used more actively later on by the CBRT, was the ROM. In this mechanism, banks are given the option of holding some percentage (reserve option tranches) of their required Turkish lira (TL) reserves as foreign exchange and/or gold (Figure 7). For each tranche, there is a coefficient, called the reserve option coefficient, which specifies the amount of foreign exchange or gold that can be held per unit of TL-required reserves. If banks want to use a particular tranche, they have to hold the tranche's TL-coefficient equivalent in foreign exchange. Banks use the option even if the coefficient is larger than 1 because they have access to foreign funds and the cost of foreign exchange

is lower compared with the Turkish lira. However, as the coefficient gets larger, banks will approach an indifference point for using the option. So, as international funding conditions fluctuate and the relative cost of foreign funding changes, banks can decide on their optimal level of usage.

The ROM is a market-friendly mechanism and works as an automatic stabiliser. If there is a decrease in the availability of foreign funding or an increase in its cost, banks curtail their use of the mechanism and reduce their reserves at the CBRT. On the other hand, if the availability of foreign funds increases or its cost decreases, banks deposit more available funds as reserves at the CBRT. In this way, the mechanism smoothes the volatility in the exchange rate to some extent. During the second half of 2012 and the first part of 2013, when the portfolio and short-term capital flows to emerging market countries and to Turkey accelerated again (Figures 1 and 3), this mechanism was able to channel a sizeable portion of the flows into the CBRT's reserves and limit the possible adverse effects on the exchange rate and the economy.

Smoothing role of interest rate corridor   Figure 8

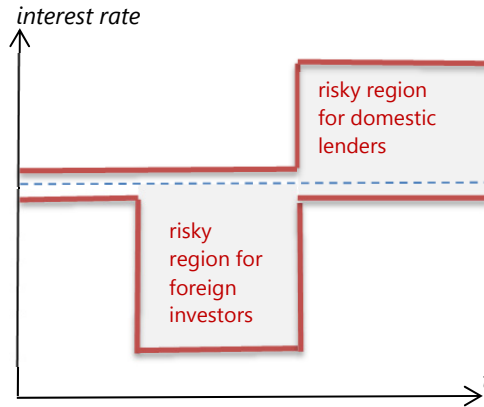Source: Authors' calculations

---

Regarding the functioning of these tools, one can consider a simple framework in terms of the supply and demand for foreign exchange (Figure 8). In this framework, the supply of foreign exchange can be taken as inelastic, for reasons of simplicity, and so the supply will be affected only by developments in the global financial markets and risk perception. Thus, the asymmetric use of the interest rate corridor can be considered to lessen the impact of the volatility in short-term capital flows.[4] When risk perception is overly optimistic and there are strong inflows, decreasing the lower part of the corridor creates uncertainty over the returns for foreign investors and limits the inflows to some extent (Figure 9). In effect, this lower part of the corridor will take away some of the increase in the inflows (Figure 8). In the case of overly pessimistic risk perception and capital outflows, the upper part of the corridor will provide a return assurance, with an upward bias in the returns, for foreign investors. Also, the upper part of the corridor will create

---

[4]   For a more general discussion of possible uses of the asymmetric interest rate corridor, see Goodhart (2013).

uncertainty over the funding costs for domestic banks, thereby limiting credit growth (Figure 9).

The corridor and its asymmetric effect on domestic/global lenders   Figure 9

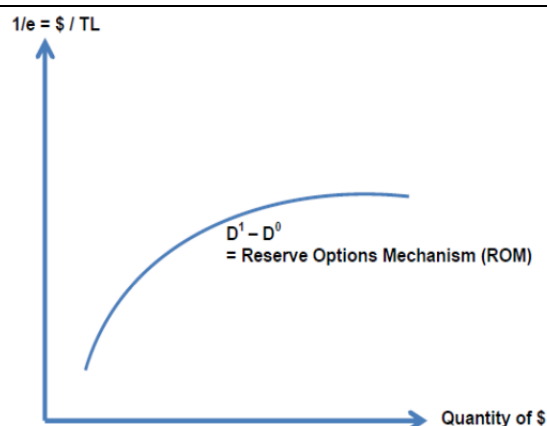Source: Authors' calculations

---

In the simple demand and supply framework, the ROM can be considered a way of decreasing the sensitivity of demand to supply shifts. So, when there is an increase in the supply, instead of putting extra foreign exchange into the economy, the mechanism steers some into the central bank reserves, and vice versa (Figure 10). Thus, in effect, the ROM creates a less steep demand curve D^0 compared with the original curve D^1, the difference between the two demand curves being the amount of foreign exchange reserves in the mechanism (Figure 11). This mechanism is very similar to the standard reserve policy of emerging market countries, but the ROM is a market-friendly mechanism that can be used frequently by banks according to aggregate economic conditions or in times of abnormal bank conditions.

Smoothing role of Reserve Option Mechanism (ROM)   Figure 10
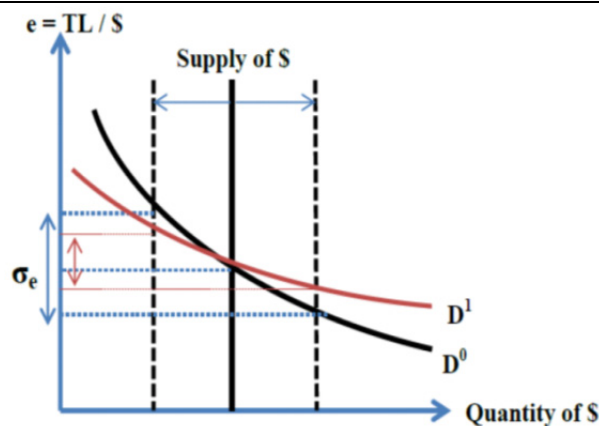
Source: Authors' calculations

Source: Authors' calculations

3. Cross-country evidence regarding the Turkish case

This section tests the hypothesis that, after 2010, portfolio flows overall became more sensitive to risk perception on the back of low yields and the QE policies of advanced countries. We also test whether macroprudential policies in Turkey have lessened the country's sensitivity in this regard. To conduct these tests, we construct a quarterly data set of 44 countries covering 2005–12.[5] Our theoretical underpinnings and empirical strategy are similar to Bruno and Shin (2013, 2014), who analyse an environment with global banks and centralised funding, and show that cross-border bank flows are driven by the operations of global banks. The authors then propose an empirical methodology whereby cross-border flows are determined by the inter-office assets of foreign banks in the US as a source of wholesale funding, risk perception as measured by VIX, and a number of controls including recipient-country variables.

Here, we consider portfolio flows to be similar to bank flows. In addition, the distribution of portfolio flows is determined in a highly integrated financial market in which investors may switch easily among different markets. Consequently, global liquidity conditions and risk perception will be important drivers of the portfolio flows, along with the fundamentals in the recipient countries. This enables us to propose an equation similar to the one used in Bruno and Shin (2014), where

---

[5]   The data are collected from the IFS-IMF, the Fed and the World Bank. Portfolio inflow is taken as non-residents' net purchases of domestic assets, and is normalised by seasonally adjusted GDP. ΔDebt/GDP is provided at an annual frequency (World Bank), and is linearly interpolated to convert the series into a quarterly frequency. The sample countries are similar to those in Bruno and Shin (2014): Argentina, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Malaysia, Mexico, the Netherlands, Norway, Philippines, Poland, Portugal, Romania, the Russian Federation, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, the United Kingdom and Uruguay.

portfolio flows to a country (*Portfolio Flows/GDP*) are determined by the level and the change in VIX, the US money supply (*ΔUS M2*), changes in real exchange rates, and the real GDP and debt-to-GDP ratios (*ΔRER, ΔGDP, and ΔDebt/GDP,* respectively) for each country *i*.[6]

Portfolio Flows/GDP $_{it}$ = β_0 + $\beta_1 VIX_{t-1}$ + $\beta_2 \Delta VIX_{t-1}$ + $\beta_3 \Delta US\ M2_{t-1}$ +$\beta_4 \Delta RER_{it-1}$ + $\beta_5 \Delta GDP_{it-1}$ + $\beta_6 \Delta Debt/GDP_{it-1}$ + ε_{it}   *(1)*

The first column of Table 1 presents the results for all countries for the period 2005–12. The results show that a reduction in international risk appetite (an increase in ΔVIX) leads to a decrease in portfolio flows, and as a domestic factor, an increase in the use of net debt (*ΔDebt/GDP*) decreases portfolio flows (both significantly).[7] In the second column, we study whether the sensitivity of portfolio flows to risk perception has changed since 2010.[8] On average for all the countries, the results show that the sensitivity has increased since 2010, albeit insignificantly: δ_2 is estimated negative and implies a higher sensitivity, but it is estimated to be statistically insignificant. Moreover, it appears that the flows are sensitive to the change in, rather than the level of, VIX (while $\delta_1 + \delta_2 = 0$ is rejected at a p-value of .02, $\beta_1 + \beta_2 = 0$ at a p-value of .73).

The third column studies whether emerging market economies are more sensitive to international risk perception for the whole period.[9] Here, the increase in ΔVIX implies a sharper decrease in portfolio flows for this group of countries compared with the other countries (δ_3 is negative and significant). Similarly, while the flows are estimated to be more sensitive in magnitude to changes in international risk appetite after 2010, the effect is found to be statistically insignificant.

A similar conclusion can be drawn for Turkey (the fourth column). On average, Turkey appears to be more sensitive to fluctuations in international risk appetite compared to other economies (δ_4 is negative and significant).

In the fifth column, we show the main specifications for testing the effectiveness of macroprudential policies implemented in Turkey after 2010. While Turkey historically has been more sensitive to movements in international risk appetite (δ_4 is negative and significant), the country has become significantly less sensitive compared to other economies after the implementation of its new policy framework in 2010 (δ_5 is positive and significant).[10]

---

[6]   All independent variables are lagged by one quarter to ease potential endogeneity in the estimation.

[7]   A lagged level of VIX appears to have a predicted positive effect on portfolio flows, yet is statistically insignificant and small in magnitude.

[8]   We specify the dummy variable 2010 to take a value of 1 from Q4 2010 (the quarter in which Turkey started implementing its new macroprudential framework), and 0 otherwise.

[9]   Emerging market countries, for which the dummy variable EM takes a value of 1, are Argentina, Brazil, Bulgaria, Chile, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Indonesia, Israel, Latvia, Lithuania, Malaysia, Mexico, Philippines, Poland, Romania, the Russian Federation, Slovakia, Slovenia, South Korea, Thailand, Turkey, Ukraine, and Uruguay.

[10]   Moreover, we test the sensitivity of portfolio flows to Turkey (as a percentage of GDP) to ΔVIX after 2010. The results suggest that Turkey has welcomed lower portfolio flows, due to an increase in ΔVIX (δ1+δ2+δ4+δ5 is negative, and significant at a p-value of .02) compared with other economies (δ1+ δ2 is negative, yet milder, and significant at a p-value of .02). Hence, while Turkey

This empirical exercise provides a straightforward way of testing the effectiveness of macroprudential variables in decreasing the sensitivity of portfolio flows to global risk perception. Other robustness checks on these results are possible, such as comparing different groups of countries and adding the related global liquidity indicators for portfolio flows. Also, other related questions remain, such as whether the possible adverse effects of portfolio flows on domestic variables are contained enough,[11] whether the macroprudential policies entail economic costs that might outweigh the benefits, or whether there are potential benefits to be had from central bank coordination regarding capital flows.

4. Conclusion

Global financial markets and the world economy have become more integrated in the last three decades. Along with this integration, the size of cross-border capital flows, including portfolio flows, has increased significantly. One important feature of portfolio flows since the global financial crisis of 2008–09 is that they have become very volatile and that their sensitivity to global risk perception has increased. This higher volatility and sensitivity to risk factors has confronted emerging market countries with difficult challenges. Most countries have used different kinds of macroprudential policies to contain the adverse effects of the volatile short-term capital flows. Turkey has also devised and used a number of new tools, such as the interest rate corridor and the Reserve Option Mechanism. These tools appear to have been effective in decreasing the sensitivity of portfolio flows in Turkey to global risk perception.

has a lower sensitivity to international risk appetite after 2010 compared with the previous period, the strength of its sensitivity is still high compared to the average.

[11] For studies on the effects of the new policy mix in Turkey, see Aysan, Fendoğlu and Kılınç (2013), Binici et al (2013), Oduncu, Akçelik and Ermişoğlu (2013), and Değerli and Fendoğlu (2013 a,b).

Determinants of portfolio flows and effectiveness of macroprudential policies in Turkey

Dependent variable: Portfolio flows/GDP

Coeff.	Independent variables	(1)	(2)	(3)	(4)	(5)
β_1	VIX_{t-1}	0.003	0.004	–0.100	0.004	0.004
		(0.006)	(0.007)	(0.008)	(0.007)	(0.007)
β_2	VIX_{t-1} * 2010		–0.002**	–0.002**	–0.002**	–0.002**
			(0.001)	(0.001)	(0.001)	(0.001)
β_3	VIX_{t-1} * EM			0.026**		
				(0.012)		
β_4	VIX_{t-1} * TR				0.015**	0.012*
					(0.006)	(0.007)
β_5	VIX_{t-1} * 2010 * TR					0.025***
						(0.009)
δ_1	ΔVIX_{t-1}	–0.014*	–0.016**	–0.016**	–0.016**	–0.016**
		(0.008)	(0.008)	(0.008)	(0.007)	(0.008)
δ_2	ΔVIX_{t-1} * 2010		–0.004	–0.006	–0.004	–0.005
			(0.004)	(0.005)	(0.004)	(0.004)
δ_3	ΔVIX_{t-1} * EM			–0.024*		
				(0.012)		
δ_4	ΔVIX_{t-1} * TR				–0.018**	–0.030**
					(0.007)	(0.01)
δ_5	ΔVIX_{t-1} * 2010 * TR					0.013**
						(0.006)
γ_1	$\Delta US\ M2_{t-1}$	0.0457	0.143	0.160	0.144	0.146
		(0.081)	(0.118)	(0.119)	(0.118)	(0.119)
γ_2	ΔRER_{it-1}	–0.017	–0.016	0.002	–0.015	–0.014
		(0.028)	(0.029)	(0.029)	(0.029)	(0.029)
γ_3	ΔGDP_{it-1}	0.053	0.065	0.076	0.066	0.066
		(0.05)	(0.051)	(0.055)	(0.052)	(0.052)
γ_4	$\Delta Debt/GDP_{it-1}$	–0.390**	–0.375**	–0.348**	–0.374**	–0.374**
		(0.186)	(0.188)	(0.174)	(0.188)	(0.189)
γ_5	2010 * TR					–0.072**
						(0.030)
γ_0	Constant	0.012	0.008	0.006	0.008	0.008
		(0.014)	(0.015)	(0.017)	(0.015)	(0.59)
	Number of obs.	1425	1425	1425	1425	1425
	Within R^2	0.115	0.118	0.129	0.119	0.119
	Number of countries	44	44	44	44	44
	Fixed effects	Yes	Yes	Yes	Yes	Yes

* and ** shows significance at the 10% and 5% levels. Errors are the cluster-robust standard errors. P-values are in brackets.

Source: IMF, World Bank, Fed and CBRT

References

Alper, K, H Kara and M Yörükoğlu (2013): "Reserve options mechanism", *CBT Central Bank Review*, no 1.

Aysan, A, S Fendoğlu and M Kılınç (forthcoming): "Macroprudential policies as buffer against volatile cross-border capital flows", *Singapore Economic Review*.

Başçı, E and H Kara (2011): "Financial stability and monetary policy", *CBT Working Papers*, no 8.

Binici, M, H Erol, H Kara, P Özlü and D Ünalmış (2013): "Interest Rate Corridor: A New Macroprudential Tool?", *CBT Research Notes in Economics*, no 20.

Bruno, V and H S Shin (2013): "Capital flows, cross-border banking and global liquidity", *Princeton University CEPS Working Papers*, no 237a.

——— (2014): "Assessing macroprudential policies: case of South Korea", *Scandinavian Journal of Economics*, vol 116, no 1, pp 128–57.

Değerli, A and S Fendoğlu (2013a): "Exchange rate expectations and CBRT monetary policy", *CBT Research Notes in Economics*, no 2, (in Turkish).

——— (2013b): "Reserve option mechanism as a stabilizing policy tool: evidence from exchange rate expectations", *CBT Working Papers*, no 28.

Goodhart, C (2013): "The potential instruments of monetary policy", *CBT Central Bank Review*, no 2.

International Monetary Fund (2013a): "Unconventional monetary policies – recent experience and prospects", *IMF Staff Report*.

——— (2013b): "Global impact and challenges of unconventional monetary policies", *IMF Policy Paper*.

Oduncu, A, Y Akçelik and E Ermişoğlu (2013): "Reserve options mechanism: a new macroprudential tool to limit the adverse effects of capital flow volatility", *CBT Central Bank Review*, no 3.