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PAVING THE WAY FOR AN ECONOMIC CRISIS WITH HIGH LEVERAGE AND CURRENCY MISMATCHES: 2018-19 CRISIS IN TURKEY

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Abstract: In the aftermath of the global financial crisis monetary policies in advanced economies caused a surge in cross-border lending to emerging market economies (EMEs). Policymakers of EMEs criticized those policies on the grounds that they pave the way for financial imbalances in EMEs and called for international policy coordination. Up to mid-2018 leverage of banks and foreign currency exposure of nonfinancial corporates increased sharply in Turkey. Under these conditions, a shock that causes a stop in capital flows can trigger crisis in EMEs. The Turkish economy was hit by several external shocks and entered a recession in the third quarter of 2018. This study aims at analyzing the role of financial vulnerabilities and domestic policies in Turkey's 2018-19 crisis and draw policy lessons. We argue that, notwithstanding complaints regarding lack of international policy coordination, domestic policy mistakes played an important role in paving the way for the crisis.

JEL Classification: E32, E52, F34, F42, G01, G38

Keywords: Crisis, cross-border lending, currency mismatches, leverage

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I. INTRODUCTION

Since the global financial crisis, there has been a substantial increase in global liquidity stemming from monetary policies implemented in large advanced economies. Consequently, a surge in cross-border lending to emerging market economies (EMEs) and a rapid rise in leverages of their financial sectors has been observed. Figure 1 shows the cross-border claims of Bank for International Settlements (BIS) reporting banks on banks of EMEs and Turkey from the first quarter of 2007 to the last quarter of 2019. Despite there are some temporary deviations from the main upward trend, the rise in cross-border lending to banks of EMEs is considerable. The trend is much steeper for Turkey: the cross-border lending to banks increased sharply till 2016 and remained at elevated levels up to mid-2018 and then started to decline.

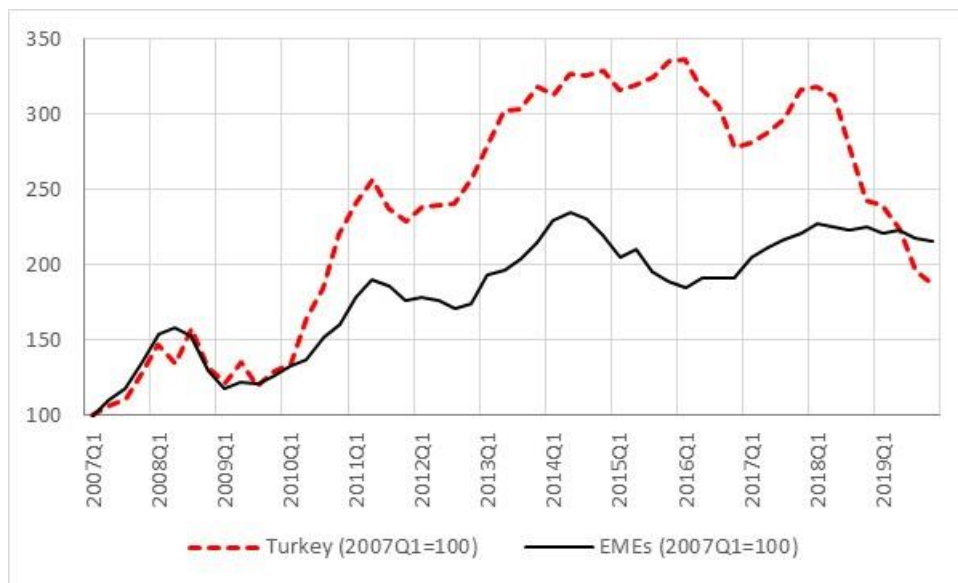


Figure 1. Cross-border claims of BIS reporting banks on banks of emerging market economies and Turkey: 2007Q1-2019Q4 (index, 2007Q1=100)

Source: BIS Locational Banking Statistics

Yet, this is only one side of the story. As emphasized by Avdjiev, Chui, and Shin (2014), nonfinancial corporates (NFCs) from EMEs have also tapped offshore debt securities markets to obtain external funding. Avdjiev, McGuire, and Peter (2020) document the sharp rise in external creditors' claims on NFCs of EMEs since the global financial crisis. Similarly, McCauley, McGuire, and Sushko (2015) show the rapid rise in outstanding US dollar liabilities of nonfinancial borrowers of EMEs in the aftermath of the global financial crisis. Figure 2 depicts the evolution of externally financed debt of NFCs together with the evolution of cross-border claims of BIS reporting banks on all sectors. The externally financed debt of NFCs was sizable and followed a similar trend with claims on all sectors.¹



Figure 2. Cross-border claims of BIS reporting banks on all sectors of Turkey and externally financed debt of nonfinancial corporates of Turkey: 2013Q4-2019Q4 (% GDP)

Source: BIS and Central Bank of Turkey

¹ Externally funded debt is calculated as in Avdjiev, McGuire, and Peter (2020). It is the sum of the following three components: (i) international debt securities issued by resident NFCs; (ii) direct cross-border credit of BIS reporting banks to resident NFCs; (iii) Indirect cross-border lending of BIS reporting banks to resident NFCs (cross border claims of BIS reporting banks-cross-border liabilities of BIS reporting banks). BIS reports data on (ii) since 2013Q4.

Policymakers of EMEs criticized lack of international policy coordination.² They argued that advanced economies should take negative spillovers to EMEs – appreciation pressure on their currencies and buildup of financial imbalances- into account when adjusting their monetary policies.³ Indeed, Turkey witnessed a rather rapid domestic credit growth and a sharp rise in currency mismatches on balance sheets of NFCs (Figure 3). We measure the currency mismatch as the difference between the liabilities and assets of NFCs denominated in foreign currency and linked to foreign currency. It covers claims on and liabilities to both residents and non-residents. It is striking how real credit volume and currency mismatch moved in tandem. This observation is in line with the findings of Giovanni et al. (2018) who show that there is a direct link between global liquidity, capital flows, and domestic credit boom in Turkey. Similarly, Özatay (2016) presents the significant positive relation between capital flows and credit supply in Turkey. Chui, Kuruc, and Turner (2018) show that rise in corporate indebtedness and currency mismatches on balance sheets of NFCs are common to most of EMEs. Avdjiev, McGuire, and Peter (2020) document how foreign currency borrowing of NFCs from both domestic and foreign sources has risen in EMEs after the global financial crisis.

As highlighted by Gourinchas and Obstfeld (2012), rapid increase in leverage plays a significant role across all types of crisis. Schularick and Taylor (2012) similarly document the powerful predictive power of real credit growth for financial crises.⁴ Excessive foreign currency debt and currency mismatches are at the center stage of early financial crisis models presented in Aghion, Bachetta, and Banarjee

² A well-known example is the criticisms of the governor of Reserve Bank of India (Rajan, 2013).

³ In the aftermath of the global financial crisis discussions on international policy coordination heightened. See, for example, the contributions in Bayoumi, Pickford, and Subachi (2015), Bordo, and Taylor (2017), Feenstra and Taylor (2013), and Fukuda and Shioji (2016).

⁴ Ganioglu (2016), using a sample of 24 advanced and 21 developing economies, shows that excessive credit growth is a leading indicator of banking crises.

(2000), Caballero and Krishnamurthy (2003), Cespedes, Chang, and Velasco (2004), Chang and Velasco (2001), and Krugman (1999) among others.

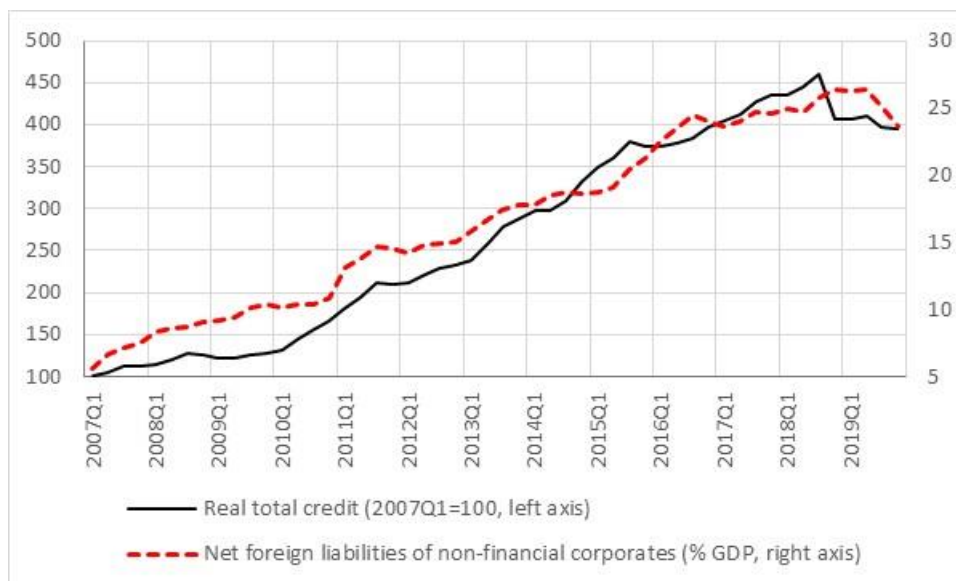


Figure 3. Real domestic credit volume in Turkey (index, 2007Q1=100, left axis) and currency mismatches on balance sheets of nonfinancial corporates in Turkey (net foreign liabilities of nonfinancial corporates as % GDP, right axis): 2007Q1-2019Q4
Source: Central Bank of Turkey and Turkey Data Monitor

The Turkish economy was hit by a crisis in August 2018 and entered a recession in the third quarter of 2018. It took six quarters for GDP to exceed its pre-crisis peak level. During this period, a net capital outflow occurred which amounted to 1.9% of GDP. Claims of BIS reporting banks on resident banks and foreign external debt of NFCs declined sharply (Figures 1 and 2) and the lira depreciated considerably. Both the duration and the magnitude of GDP contraction were lower than those observed during the global financial crisis. Nevertheless, the decline in the employment rate was much higher during the 2018-19 episode. It is the objective of this study to analyze Turkey's 2018-19 crisis, document the role of

financial fragilities and the lack of timely domestic policy response to correct financial imbalances in the crisis, and draw policy lessons.⁵

There are two important features of the crisis. Notwithstanding the discussions on the lack of policy coordination among advanced economies and EMEs, the first feature of the crisis is the lack of domestic macroprudential financial policies to contain rise in leverage and currency mismatches. In fact, Turkey eased foreign currency borrowing regulations as a response to the global financial crisis. The decision was not revoked until January 2018. Apparently, this was an important policy mistake that led to an increase in currency mismatches.⁶ Moreover, elevated cross-border lending and the ensuing increase in credit supply led to a boom in construction activity in the expense of investments in tradable sectors. Again the policymakers did not take any measure to reduce the rate of growth of credit supply to the construction sector. By the sharp depreciation of currency in the third quarter of 2018, the real estate sector collapsed and non-performing loans elevated. This was one of the main factors behind the heavy loss in employment.

Second, the Turkish case demonstrates how a financially fragile country is susceptible to various types of shocks –even to tweet posts. In the eve of the crisis, fiscal policy was sound and the banking sector was strong. Nevertheless, high foreign currency debt and currency mismatches on balance sheets of NFCs rendered them vulnerable to a sudden stop in cross-border lending. A sudden stop is an important threat for EMEs with currency mismatches (Calvo, 1998; Forbes and Warnock, 2012). Alfaro et al. (2017) show that currency depreciations magnify the impact of leverage on financial weakness for large firms during a crisis.

Bruno and Shin (2015a) highlight the close relationship between banking sector capital flows and US monetary policy. The model that they develop indicates the

⁵ Previous crises in Turkey are analyzed in Akyürek (2006), Akyüz and Boratav (2003), Alper and Onis (2003), Özatay (2000), Özatay and Sak (2002), and Özkan (2005).

⁶ For a recent discussion on policy options, see Rey (2018).

role of the US dollar appreciation in the tightening of global financial conditions and association of financial crises with dollar shortages. Rey (2018), based on a VAR analysis, finds that monetary policy in the center country affects leverage of global banks and credit flows in the global financial system. Tightening of the US monetary policy leads to a decrease in cross-border flows (Bruno and Shin, 2015b). A policy rate hike cycle can have huge impact on EMEs through tighter supply of dollars, a rise in domestic currency borrowing rates, deterioration in balance sheets of sectors which have significant currency mismatches (Acharya et al., 2015).⁷ Forbes and Warnock (2012) emphasize that increases in global risk predict sudden stops in capital flows. A widely used indicator of global risk is the VIX index -the implied volatility in S&P 500 stock index option prices from Chicago Board Options Exchange. Bruno and Shin (2015a, 2015b) and Rey (2018) demonstrate the close link between global liquidity and VIX.

We present that the main triggering factor was not a rise in global risk aversion. The global risk aversion measured by VIX was at historically low levels throughout 2017 and close to these low levels in 2018 –especially from April 2018 to October 2018. Yet, the main triggering factor was a series of rather negative messages from the president of the US in July and August 2018. This demonstrates that it is not only an economic factor such as the stance of the monetary policy of the US that affects the risk appetite and cross-border flows, factors related with foreign policy can also play a dominant role. In the Turkish case, the threats of Donald Trump sharply increased risk perception for Turkey and led to a shortage of dollar supply. This indicates how risky carrying big currency mismatches on balance sheets is.

The remainder of the paper is organized as follows. Section II documents the evolution of the exchange rate, interest rate, foreign currency reserves, and the

⁷ One strand of the literature discusses global “push factors” for capital flows. See, among others, Diaz-Alejandro (1983), Calvo, Leiderman, and Reinhart (1996), Reinhart and Reinhart (2009).

market pressure during the crisis. Section III is on economic fundamentals of the pre-crisis period. We also compare these fundamentals with those of the pre-global crisis period. The triggering factors are discussed in Section IV. The impact of the crisis on output and employment are documented and contrasted with those of the global financial crisis episode in Section V. We discuss policy implications in Section VI. Section VII concludes.

II. PRESSURE IN THE MARKETS

Figure 4 presents the value of the lira against an equal weighted basket of the euro and the US dollar, and the evolution of the overnight money market rate from the first business day of 2017 to the last business day of February 2020. Figure 5 shows the time path for the weekly official foreign exchange reserves in the same period. The exchange rate and money market rate exhibited an upward trend -a rise of the exchange rate shows depreciation whereas the reserves followed a downward trend starting from early 2018. The deterioration in each of the variables was rather sharp in the first half of August 2018.⁸

To highlight the severity of the pressure in the markets and contrast it with what happened during the 2000-2001 and global crisis episodes, we form an exchange market pressure index along the lines of Eichengreen, Rose, and Wyplosz (1995) for the January 2000 - February 2020 period. It is an equal weighted average of the monthly percentage changes of basket exchange rate, money market rates, and (the negative of) official reserves. The monthly percentage change of each variable is weighted by the inverse of its variance. There are three instances at which the index exceeds its two standard deviations: the first one marks the end of the preannounced crawling peg exchange rate regime of the January 2000 - February 2001 period.

⁸ The first case of corona virus infected person was identified in early March 2020 and various social distancing measures were put in place in the second half of 2020. This is why we end the sample on the last business day of February 2020.

This regime was collapsed in February 2001 and Turkey faced a severe crisis. Since then Turkey has been implementing a floating exchange rate regime. The second instance is the October 2008 period and the third one is the August 2018 – September 2018 period (Figure 6).

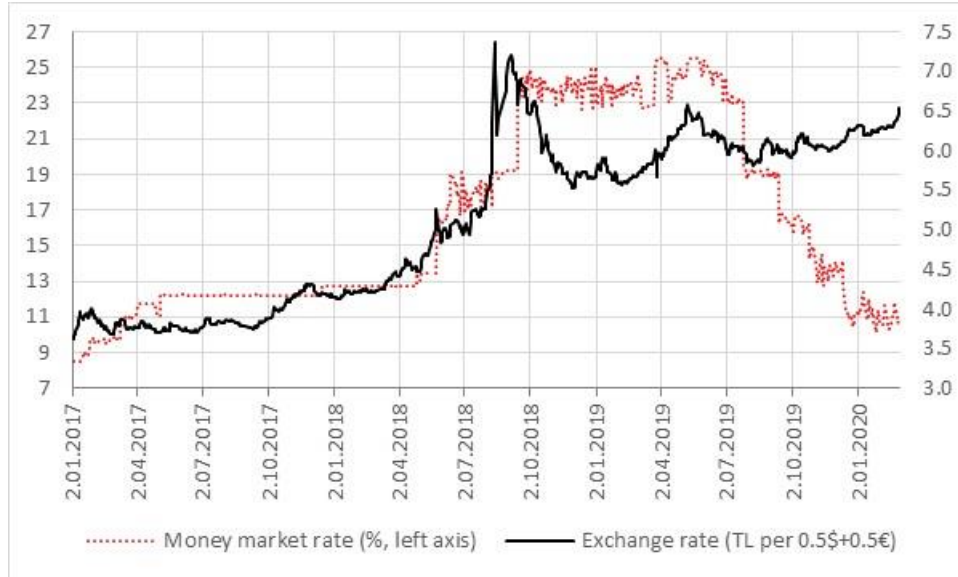


Figure 4. Overnight money market rate (% , left axis) and exchange rate (lira per equal weighted basket of US dollar and euro, right axis): January 2017-February 2020
Source: Central Bank of Turkey and Turkey Data Monitor

Two points should be emphasized. First, the market pressure in the first instance (February-April 2001) was higher than the last two cases. A number of researchers has analyzed this crisis and a further analyze is beyond the scope of this paper.⁹ What is important from the perspective of the current study is that in the aftermath of the 2000-2001 crisis, Turkey implemented a stabilization and structural adjustment program up to 2007 and corrected a number of significant imbalances in its economy as discussed in the next section. Despite this fact, Turkey was deeply

⁹ See, for example, Akyürek (2006), Akyüz and Boratav (2003), Alper and Önis (2003), Özatay and Sak (2002), and Özkan (2005).

affected from the global crisis -the second instance marked by the market pressure index- and faced another crisis in August 2018. Second, the pressure on the market was significantly higher in the last episode compared to the global crisis period. We discuss the underlying reasons in the next section.

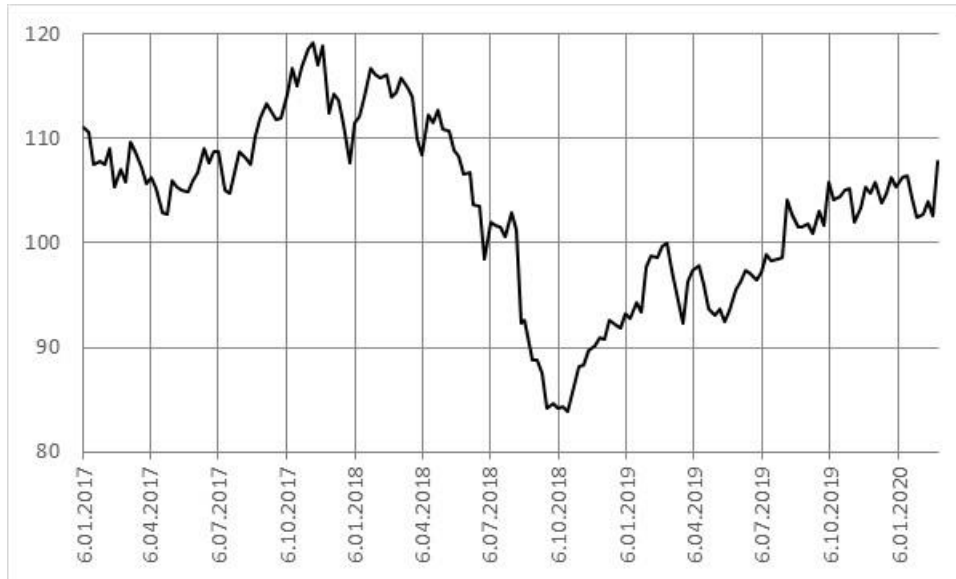


Figure 5. Foreign exchange reserves of the Central Bank of Turkey (billions of US dollars):
January 2017-February 2020
Source: Central Bank of Turkey

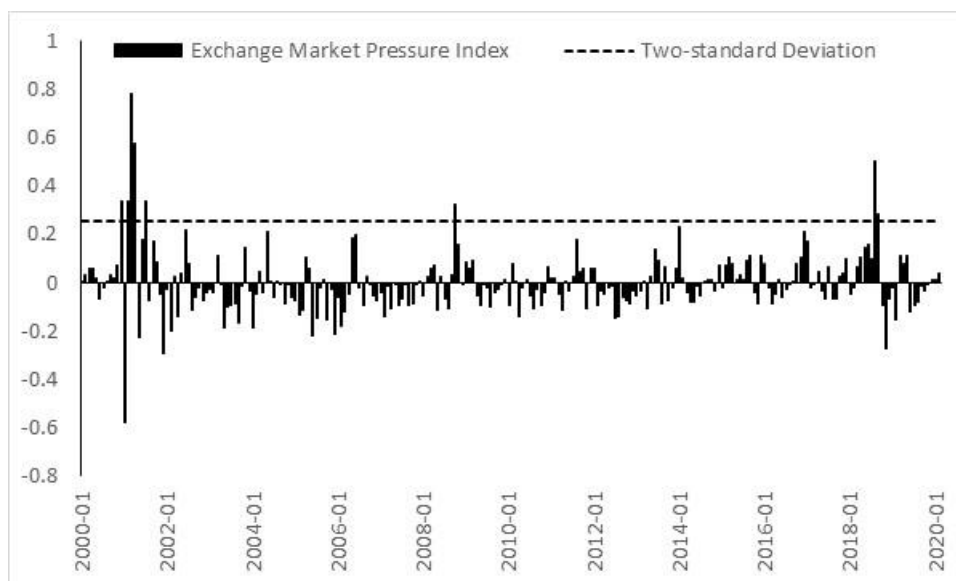


Figure 6. Exchange market pressure index: January 2000-February 2020

Notes: The horizontal dashed line indicates two-standard deviation.

Source: Author's calculations based on data from Turkey Data Monitor

III. ECONOMIC FUNDAMENTALS

A From the 2000-2001 Crisis to the Global Crisis

In April 2001, almost two months after the collapse of the lira, Turkey announced a new IMF supported economic program. Establishing fiscal discipline, strengthening the financial sector, and changing the institutional structure that paved the way to the 2001 crisis were the main elements of the program. It was implemented up to the onset of the global financial crisis. The program was successful in decreasing inflation and increasing per-capita GDP growth. Consumer inflation declined to 8.5% at the end of 2007 from a level of 68.5% at the end of 2001. The average per-capita growth rate of 2002-2007 was 5.5% -more than two times of the preceding 50 years average growth rate.

TABLE 1
Indicators of Economic Fundamentals

	2000 ^a	2007	2010	2011-14 ^b	2015	2016	2017
Current account balance (% GDP)	-3.6	-5.4	-5.7	-6.1	-3.2	-3.1	-4.7
Net capital inflow (% GDP)	4.7	6.6	7.5	7	1.1	2.6	4.5
Net international investment position (% GDP)	-36	-45.9	-46.7	-44.1	-44.2	-42.3	-53.8
Foreign exchange exposure of the nonfinancial corporate sector (% GDP) ^d	n.a. ^c	7	11.6	17.9	23.5	27.3	25.5
Reserves of the central bank/M2 (year average)	0.27	0.28	0.22	0.28	0.29	0.27	0.26
Reserves of the central bank (% GDP)	5.3	5.3	5.4	5.4	5.8	6.3	5.6
Public debt (% GDP)	37.1	37.6	40.6	33.2	28.9	28.9	28
Foreign currency denominated and indexed public debt ^e (% of total debt)	45.7	31.4	26.7	30.2	35.1	38.3	38.9
Budget balance (% GDP)	-7.6	-1.5	-3.4	-1.3	-1	-1.1	-1.5
Primary budget balance (% GDP)	4.3	3.9	0.7	1.5	1.3	0.8	0.3
Total credit volume (% GDP)	18.6	32.2	45	54.2	63.2	66	67
Real credit growth (% , year average)	5.6	18.4	20.5	20.1	18.3	4.7	9.6
Non-performing credit ratio (%)	12.4	3.5	3.8	2.9	3.2	3.4	3.1
Return to capital (%)	-38	20	16.4	12.5	9.9	12.5	13.6
Credit-to-deposit ratio	0.54	0.8	0.85	1.07	1.19	1.19	1.23
Consumer inflation ^f (%)	39	8.4	6.4	8.1	8.8	8.5	11.9
Expected consumer inflation ^f (one-year ahead, %)	n.a.	6.1	7	6.9	7.6	8	9.3
Money market rate ^g (nominal, %)	234.5	16.2	6.1	9.2	10.8	8.5	12.5
Currency default swaps ^g (basis points)	n.a.	172	144	201	272	283	177
Real exchange rate ^h	115.6	127.8	120.2	105.3	99.1	93.6	86.4
GDP growth rate (%)	5.9	5.9	8.4	7.4	6.1	3.2	7.5
Employment rate ⁱ (%)	n.a.	40	42.4	44.3	46.4	46.1	47.8

Notes: ^a There were two GDP revisions after 2000. % GDP values are calculated using the latest GDP figures. The latest GDP figure for 2000 is 1.43 times higher of the GDP figure for 2000 before the revisions. That is, in the information set of economic agents of the time, these ratios were higher by 1.43 times. ^b Period averages. ^c 'n.a.' stands for not available. ^d Foreign currency exposure of the nonfinancial corporate sector denotes the gap between the foreign exchange denominated and linked liabilities and assets of the nonfinancial corporate sector. ^e Only foreign currency denominated debt for 2000. ^f End of the year values. ^g Averages of daily data for December. ^h An increase denotes real appreciation. ⁱ Labor statistics before 2005 are not comparable.

Source: Turkish Data Monitor.

Several factors contributed to this achievement. The first one was the radical correction of a number of economic imbalances of the pre-2001 crisis period. On the structural side; the Central Bank of Turkey (CBT) gained its independence, an autonomous banking sector supervisory and regulatory agency (BRSA) was formed, the banking sector was recapitalized, agricultural support system was

redesigned, and the tender law was changed to reduce corruption. On the stabilization side; fiscal policy and financial sector indicators improved drastically. Table 1 compares the 2000 and 2007 –pre-crisis- values of a set of key macroeconomic variables. It should be emphasized that the collapse of the lira in February 2001 and the subsequent policy reaction deteriorated considerably several variables with respect to 2000. So, the positive performance becomes more striking when one focuses on the changes between 2001 and 2007 for a number of variables. For example, public debt jumped to 72.5% of GDP (it was known as almost 100% of GDP at the time –see the notes for Table 1), non-performing loan ratio elevated to 41.4%, and the inflation rate increased to 68% at the end of 2001. Second, Turkey’s relations with the European Union significantly improved and consequently, the European Council took the decision to start accession negotiations with Turkey in October 2005. Third, there was ample global liquidity in most of the period. However, absent the first factor, the positive effect of the second factor would have been rather minimal and the third factor could have amplified the imbalances.

B The Aftermath of the Global Crisis: Macroeconomic Indicators

The strong fiscal stance created a sizable fiscal space for Turkey. This allowed Turkey to implement countercyclical fiscal policy in the 2009-2010 period as a response to its contracting economy, without increasing the risk perception.¹⁰ Five-year credit default swap (CDS) was jumped to 830 basis points on the 23rd of October 2008. Nonetheless, during the period of fiscal stimulus, CDS was at low levels: it was hovering around 180 basis points in December 2009, and furthermore the December 2010 reading was even lower: 144 basis points.

¹⁰ Horton, Kumar, and Mauro (2009) appraise policy response of G20 countries.

The countercyclical fiscal policy without increasing sovereign risk was a manifestation of the graduation of Turkey from the procyclical fiscal policy camp.¹¹ Naturally, this policy raised public debt-to-GDP ratio, albeit the increase was limited and temporary. Consequently, public debt ratio followed a downward trend and reached a rather low level at the end of 2017 -thanks to low budget deficits and primary surpluses of the whole period of 2010-2017.

Compared to the end of 2007, the ratios of foreign exchange reserves of the CBT to broad money (M2) and output stayed intact.¹² Inflation was high relative to its peers however fluctuated around a mean of 8% in the period of 2008-2016 within a relatively low band. Furthermore, there was no deterioration in inflation expectations (Table 1).

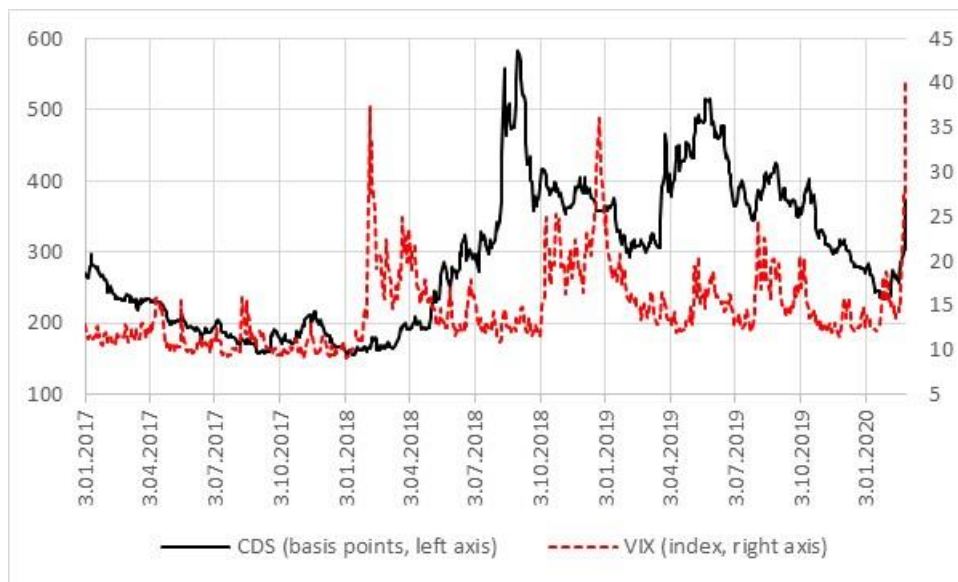


Figure 7. Five-year sovereign credit default swaps (CDS, basis points, left axis) and VIX (index, right axis): January 2017-February 2020

Source: Turkish Data Monitor

¹¹ For fiscal space, see for example, Gosh et al. (2013). The “graduation from the procyclical fiscal policy camp” term was coined by Frankel, Vegh, and Vuletin (2013).

¹² Reserves-to-broad money ratio is an important vulnerability indicator (Sachs, Tornell, and Velasco, 1996). Gourinchas and Obstfeld (2012) find the ratio of reserves to output as a significant predictor of crisis for EMEs.

There were some negative signs as well. The foreign currency denominated or indexed share of public debt had started to increase since the last months of 2010 and reached 39% at the end of 2017. Another concern was the borrowing and income guarantees given for the investment and operation of mega-projects.¹³ However, the low debt ratio was limiting their importance (Table 1).

The upshot is that most of the macroeconomic indicators were demonstrating a positive performance as of the end of 2017, and there was no deterioration relative to the end of 2007. The sovereign risk of Turkey supports this view: CDS was at low levels at the end of 2017 as at the end of 2007 (Figure 7, Table 1).

C The Aftermath of the Global Crisis: Global Liquidity, Leverage, Foreign Currency Mismatches, and Risks

The discussion so far demonstrates that the main problems were the high leverage of the banking sector and the currency mismatches on the balance sheets of the NFCs on the eve of the crisis. In the introduction section, we document the rapid domestic credit increase (Figure 3), which is an important predictor of financial crises as emphasized by Schularick and Taylor (2012). Table 1 provides further information regarding the leverage of the banking sector. Domestic credit-to-output ratio –one of the three variables indicated by Gourinchas and Obstfeld (2012) as playing a significant role across all types of crisis- increased more than two-folds from end-2007 to end-2017. Rey (2018) measures the leverage of the banking sector as the credit-to-deposit ratio. Table 1 documents the sharp rise in this ratio over the 2007–2017 period. Alfaro et al. (2017) compute Altman’s Z-scores for

¹³ Cufadar and Özatay (2017) assess the impact of foreign currency denominated debt on the implementation of counter-cyclical fiscal policy for emerging market economies. Burnside, Eichenbaum, and Rebelo (2001) argue that a principal cause of the 1997 Asian crisis was large prospective deficits associated with implicit bailout guarantees to failing banking systems.

NFCs of 26 EMEs and classify countries' corporate sectors into three: those in the safe zone, in the vulnerable zone, and in the distress zone. While the NFC sector of Turkey was in the safe zone from 2003-2007, it was in the vulnerable zone during the 2008-2014 period.

Figure 3 presents the dramatic rise in currency mismatch on balance sheets of NFCs from the first quarter of 2007 to the last quarter of 2019. Table 1 also sheds light on this problem by comparing annual values: the gap between the foreign currency and foreign-currency-linked liabilities and assets of nonfinancial corporates was 7% of GDP at the end of 2007 and increased to 25.5% of GDP at the end of 2017. The gap widened further and reached 29% in the second quarter of 2018 -just before the burst of the crisis. Avdjiev, McGuire, and Peter (2020) estimate the externally funded debt and total foreign currency debt of NFCs for 16 large EMEs. They demonstrate that both of the indicators (in percent of GDP) have risen sharply in the aftermath of the global currency crisis. Turkey is in the top five list (see Figure 2 for Turkey). Another mismatch indicator is the net international investment position. It was -53.8% of GDP as of the end of 2017. This was the lowest reading among the emerging market economies in G20 and indicating eight percentage points deterioration relative to 2007.¹⁴ These developments have rendered Turkey vulnerable to a stop in cross-border lending and sharp depreciation.

What are the determinants of cross-border lending? Bruno and Shin (2015a) estimate various panel regressions for a sample of 46 countries over the 1996Q1-2011Q4 period taking cross-border loans of BIS-reporting banks on banking sector counterparties as the dependent variable. They show that a rise in global leverage

¹⁴ The net international investment position is the difference between the assets and liabilities of the residents with respect to non-residents, whereas the gap between the foreign exchange denominated and indexed liabilities and assets does not take into consideration the residency of the borrowers and creditors. For the surge in foreign currency debt in Turkey, see also Acharya et al. (2015).

as proxied by the US brokers and dealers leverage (alternatively VIX) and real appreciation of local currency are associated with an increase in cross-border lending. Expansion of domestic money stock (M2) is another significant determinant of capital flows. They also report that higher GDP growth is positively associated with banking flows, whereas a rise in public debt-to-GDP ratio affect cross-border lending negatively, though they are not significant in all of the regressions.

We estimate the same equation for Turkey for a sample period that spans from the first quarter of 2000 to the last quarter of 2019. Two alternative dependent variables are used: log first differences of cross-border loans of BIS-reporting banks to (i) banking sector counterparties, (ii) all sectors. The results are given in Table 2 (columns B1, B2, T1, and T2). In all of the alternative specifications the change in public debt as a ratio to GDP ($\Delta B/Y$) is significant and correctly signed: the higher the change in the debt ratio, the lower the change in cross-border lending to Turkey is. The global leverage (GL) is always correctly signed. It is significant for the regressions whose dependent variables are the log first difference of total cross-border lending to Turkey (columns T1 and T2). The global leverage increases, so does the total cross-border lending to Turkey.

The interest rate differential between Turkey and the US ($i-E-i^*$) is not significant in B2 and T2, and moreover incorrectly signed in T2. This may arise due to not accounting for the risk premium for Turkey. We deduct the risk premium for Turkey (E) from the domestic money market rate (i) and then calculate the risk-free interest rate differential ($i-E-i^*$). It is correctly signed (columns B3 and T3) and highly significant (T3). Finally we report a simplified version of the regressions in

columns B4 and T4. The risk-free interest rate differential is correctly signed and significant. Cross border-lending decreases with a rise in the risk-premium.¹⁵

TABLE 2
Determinants of Cross-border Lending

	B1	B2	B3	B4	T1	T2	T3	T4
GL	0.0006 (0.3)	0.001 (0.7)	0.002 (1.0)	0.003 (1.4)	0.003*** (2.6)	0.003*** (3.0)	0.004*** (3.7)	0.004*** (3.7)
LL	-0.008* (1.8)	-0.001 (0.1)	0.003 (0.4)		-0.005** (2.3)	0.006 (1.3)	0.007 (1.6)	
Δ GL		-0.006 (0.7)	-0.005 (0.6)			0.004 (0.8)	0.004 (0.9)	
Δ LL		-0.009 (0.9)	-0.012 (1.5)			-0.005 (1.1)	-0.012*** (3.3)	
Δ Ln(Q)	0.508* (1.8)	0.456 (1.6)	0.179 (0.5)		0.115 (0.8)	0.094 (0.7)	-0.174 (1.1)	
Δ Ln(M2)	1.009* (1.9)	0.921 (1.6)	0.798 (1.4)		0.393 (1.5)	0.404 (1.5)	0.285 (1.1)	
Δ Ln(Y)	-0.262 (0.5)	-0.157 (0.3)	-0.206 (0.4)		0.337 (1.2)	0.233 (0.8)	0.238 (0.9)	
Δ (B/Y)	-0.015*** (2.9)	-0.02*** (2.7)	-0.02*** (3.1)	-0.02*** (4.4)	-0.007** (2.5)	-0.01*** (3.4)	-0.01*** (3.7)	-0.006*** (3.3)
Δ Ln(P)	-0.604 (1.2)	-1.12 (1.4)	-1.206 (1.6)		0.058 (0.2)	-0.78** (2.1)	-0.69** (2.0)	
Δ (i - i*)		0.0001 (0.1)				-0.0001 (1.2)		
Δ (i - E-i*)			0.0002 (1.6)	0.0002* (1.7)			0.0002*** (3.1)	0.0002* (1.8)
R ²	0.29	0.28	0.31	0.30	0.33	0.38	0.44	0.31
DW	2.0	1.9	1.9	1.9	1.8	1.7	1.6	1.7

Notes: The dependent variable is the log first difference of the cross-border claims on banks for the columns B1 to B4 and the log first difference of the total cross-border claims on Turkey for the columns T1 to T4. The sample period, when the lags of explanatory variables are taken into consideration, is 2000Q3–2019Q4. The regressions include a constant term as well. GL: Global leverage (the total liabilities and equity of US brokers and dealers as a ratio to their total assets). LL: Local leverage as measured by the liabilities-to-net worth ratio of local banking sector. Q: Real exchange rate. M2: Broad money. Y: GDP. B: Public debt stock. P: Consumer price index. i: Money market rate. i*: Federal funds rate. E: JP Morgan's emerging market bond index for Turkey (EMBI). Δ is the first difference operator. Ln(.) denotes the logarithm of (.). All independent variables enter with one lag. Values reported in parentheses are absolute t-values. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

The external claims on the banking sector, on all of the sectors, and on NFCs followed a downward trend since the second quarter of 2018 (Figures 1 and 2). As the discussion in the preceding subsection reveals, as of end 2017 there was not a noteworthy deterioration in macroeconomic fundamentals. The regression results documented in Table 2 imply that, in the absence of a weakening in macroeconomic

¹⁵ We use EMBI instead of CDS, since EMBI data allows more observations. Alternatively, we include the change in EMBI (with one lag) in B2 and T2. It is significant and correctly signed. To save space we do not report these results.

fundamentals (as proxied in the regressions by the public debt-to-GDP ratio and the risk premium), the main potential culprit for this reversal of capital flows to Turkey should be related with factors that caused a decrease in risk appetite for the Turkish financial domestic assets. We turn to this issue in the following section.

IV. WHAT TRIGGERED THE CRISIS?

As shown in section II, the spike in the market pressure index was in August 2018. Figures 4-6 indicate that pressure in the market and risk perception for Turkey started to rise as of the early days of 2018. Consequently, there are two phases of the January-August 2018 period. The first one is from the beginning of the year roughly to July. The second is from July to mid of August. Several factors played an important role in these developments.

A Monetary Policy in the US and Turkey

The first warning signal regarding the vulnerability of EMEs to a tightening of dollar funding was the taper tantrum. In May 2013, the chair of the Fed Board announced that they were planning to gradually withdraw quantitative easing in future, which caused a rise in US Treasury yields. This led to an increase in financial stress in several EMEs. Turkey was one of them. The exchange rate rose by 8% and a 125 basis points increase in the sovereign risk premium (CDS) was recorded in one month. The CBT did not give any response. Despite this, the markets eventually calmed down. In mid-August, a research analyst coined the term “fragile five” for Brazil, India, Indonesia, South Africa, and Turkey –the countries expected to be mostly affected (negatively) from a monetary tightening in the US

On December 17 and December 25, 2013, the police force started an operation against several ministers –including the minister of interior. The alleged accusation

was bribery, which increased the tension in the financial markets.¹⁶ One dollar was 2.04 lira on the 16th of December, it then jumped to 2.1 lira on the 9th of January 2014 and 2.35 lira on the 27th of January. An important point to note for the ensuing discussion is that the CBT kept its policy rate at 4.5% despite a surge in the exchange rate and its possible inflationary effects when the markets were jittery for a country which was among the fragile five group.

On the 21st of January 2014, there was the regular meeting of the Monetary Policy Committee. Still, there was no response. The Prime-minister Erdogan applauded this policy in a press meeting in Brussels. Only after the sharp depreciation towards the end of January, in an extraordinary meeting, the CBT raised its policy rate to 10%. This was a significant negative signal regarding the independence of the CBT and its commitment to the inflation target.¹⁷ On February 11, 2014, a Fed report to the Congress became public. One section of the report was on the impact of the possible monetary tightening in the US on EMEs. Turkey was identified as the number one country, which was going to be negatively affected.¹⁸

From December 2015 to June 2018, the federal funds target rate (upper limit of the target range) increased by 1.75 percentage points. The Fed increased the federal funds target rate to 0.5% at the end of 2015 and to 0.75% at the end of 2016. These followed by three increases in 2017 and the target rate reached 1.5%. There were two increases in the first half of 2018: on the 22nd of March and on the 14th of June. The final reading of this period was 2%.

From August 2005 to February 2018, there was not any prominent increase in the VIX index. On the 5th of February, it increased to 37.3, and then declined to rather

¹⁶ Later understood that this operation was targeting prime-minister Erdogan. In fact the group, one branch of which conducted this operation, attempted to a coup-d'etat on the 15th of July 2015.

¹⁷ See, for example, the commentary in Reuters on the 21st of January 2014: "The Turkish Central Bank shies away from rate hike, credibility questioned": <https://news.trust.org/item/20140121141048-sbcpl>

¹⁸ https://www.federalreserve.gov/monetarypolicy/files/20140211_mprfullreport.pdf

low levels, staying there almost up to the mid of December (Figure 7). The Fed heightened the federal funds target rate to 2.25% at the end of September and to 2.5% on the 20th of December. In October 2017, the Fed initiated the process of balance sheet normalization. This process continued until August 2019. Total assets declined to under 3.8 trillion dollars from 4.5 trillion dollars in early 2015.

Starting from 2017, Turkey witnessed two digit inflation levels. At the end of 2017 the inflation rate was 11.9%, elevated to 15.4% in June 2018, and then to 17.9% in August 2018. The inflation target was still 5%. Nevertheless, the CBT kept its average funding rate almost constant at 12% from April 2017 to mid-November 2017, increased it to 12.75% in mid-December and preserved it at that level until the end of April 2018, despite the inflationary impact of the depreciation in the lira that started at the beginning of 2018. There were a number of measured increases up to mid of May. Then it raised its average funding rate by 3 percentage points, followed by a 1.25 percentage point increase in mid of June, and a 1.5 percentage point increase one week later. The final response came in the mid of September by a 4.75 percentage point increase. Moreover, from the end of November 2016 up to the beginning of June 2018, the policy rate was kept constant at 8%. In this period, the tightening was realized by mainly funding through the late funding window, which normally central banks do not use. This is why the average funding rate was above the policy rate almost throughout this period. There are two points to be emphasized. First, the usage of various funding mechanisms to raise the average funding rate most of the time interpreted as the reluctance of the monetary authority to increase its policy rate and sooner or later would turn to a loose monetary policy. Second, this practice broadened concerns on whether the CBT was independent.¹⁹

¹⁹ On the 14th of May 2018, there was an interview with president Erdogan at Bloomberg TV in London. This reinforced concerns about proper conduct of monetary policy and the independence of the Central Bank. For example, in the May 25, 2018 issue of Foreign Policy, an article appeared with the title: "Erdogan is Failing Economics 101" written by B. Daragahi.

The rate hikes in 2017 and the first half of 2018, the reduction in the balance sheet of the Fed, rising doubts about the independence of the CBT, and the decline of risk appetite in February 2018 contributed to the significant depreciation of the lira, rise in the money market rate, and the market pressure in the first half of 2018 (see Figures 4-6). For example, from the end of 2017 to the last business day of June 2018, the dollar appreciated by 19% against the lira. However, from the end of June to the 13th of August 2018, the increase in the exchange rate was much sharper: 49%. That is, the culprit of the burst of the crisis in August 2018 was something else. Clearly, as reflected by rather low levels of the VIX index during this period, the culprit was not a decline in global risk appetite.

B Tweets from Donald Trump

On May 16, 2017 and November 24, 2017, Donald Trump the president of the US sent friendly messages to Turkey and its president Erdogan by tweets. This mood suddenly changed towards the spring of 2018. The first negative tweet was posted on the 17th of April 2018: “Pastor Andrew Brunson ... is on trial and being persecuted in Turkey for no reason. They call him a Spy, but I am more a Spy than he is. Hopefully he will be allowed to come home to his beautiful family where he belongs!” The second tweet –on the 19th of July was harsher. The third one on the 26th of July was explicitly threatening Turkey: “The United States will impose large sanctions on Turkey for their long time detainment of Pastor Andrew Brunson ... This innocent man of faith should be released immediately!” On the 1st of August, the US administration imposed sanctions against two top Turkish government officials.

The fourth tweet of Mr. Trump posted on the 10th of August: “I have just authorized a doubling of Tariffs on Steel and Aluminum with respect to Turkey as their currency, the lira, slides rapidly downward against our very strong Dollar ...

Our relations with Turkey are not good at this time!” The final shock tweet was posted on the 16th of August: “Turkey has taken advantage of the United States for many years. They are now holding our wonderful Christian Pastor ... We will pay nothing for the release of an innocent man, but we are cutting back on Turkey!” On October 12, 2018, Mr. Brunson was released from Turkish custody and immediately returned to the United States. The next day Mr. Trump thanked Mr. Erdogan.

Clearly, the sharp rise in tensions between Turkey and the US and the significant rise in market pressure and depreciation of the lira overlap: between early July and mid-August. Hence, the main triggering factor was a number of tweet messages of the president of US.²⁰

V. IMPACT ON OUTPUT AND EMPLOYMENT

Economic contraction began in the third quarter of 2018. The contraction was milder than the contraction during the global financial crisis. GDP exceeded its pre-crisis level in the third quarter of 2019 –six quarters after the pre-crisis peak GDP of 2018Q2. This duration covered 10 quarters in the global financial crisis episode (Figure 8). Strikingly, the decline in the employment rate was much higher during the 2018-19 episode (Figure 9). Yet, what were the underlying reasons?

During the global crisis exports of goods and services declined due to a fall in foreign demand. However, in the final crisis episode the growth rate of exports was

²⁰ The 2016-19 period witnessed an escalation of Turkey’s involvement in the Syrian civil war. This fact raises the possibility that the military operations and the differences over Syria policy among Turkey, the US, and other members of NATO might have played an important role in creating the market pressure. On August 24, 2016, Turkey began a direct military intervention into Syria which targeted the Islamic State of Iraq. It ended on March 27, 2017. The second operation started on January 20, 2018. This operation increased tensions between the US and Turkey since it was aiming at cleaning the Afrin region from People’s Protection Units (YPG) which was an ally of the US. This timeline demonstrates that the second operation might have contributed to the rise in the market pressure observed in the first phase. However, the operation ended in late March 2018, from when to the end of December 2018 no publicly open negative message was heard from the sides of the conflict. On the contrary, Donald Trump tweeted several times in December 2018 emphasizing good relations and cooperation with Turkey on Syria.

always positive and its average was 10.2%. Consequently, the contribution of exports to the GDP growth was considerable. Along with this fact, the average growth rate of government consumption was higher than that realized during the global crisis episode (Table 3). In the absence of the significant positive contribution of exports of goods and services and relatively higher contribution of government consumption, the order of magnitude of GDP contraction would have been close to that observed during the global crisis.

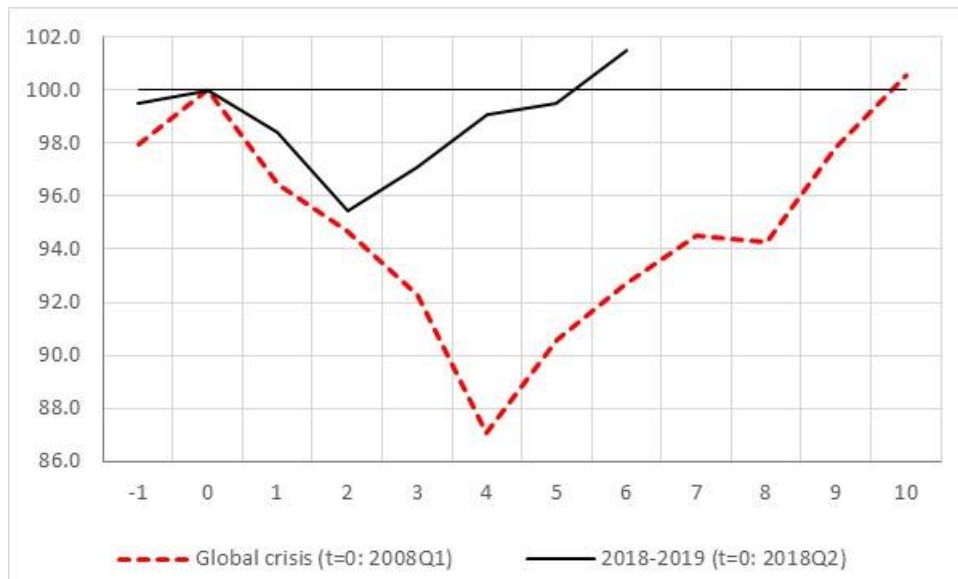


Figure 8. The evolution of GDP during the global financial crisis and 2018-19 crisis (Index, global crisis: GDP=100 for 2008Q1; 2018-19 crisis: GDP=100 for 2018Q2)

Source: Turkish Data Monitor

The heavy loss in employment during the 2018-19 crisis is directly linked to the bust of the construction sector after its boom in the decade preceding it. Construction permits (square meters per capita), the share of construction investment in total investment, and the share of value added in construction sector in GDP demonstrate the extent of the boom. The boom in this labor-intensive industry elevated its share in total employment (Table 4). Note also that this period

coincides with the high credit growth and high foreign currency exposure period documented in Table 1. Table 5 compares the growth in loans allocated to the construction sector with the growth of loans allocated to the rest of the economy and documents how nonperforming construction loans disproportionately increased with the collapse of the construction sector. Consequently, a rather high job loss occurred in the sector and in the economy.

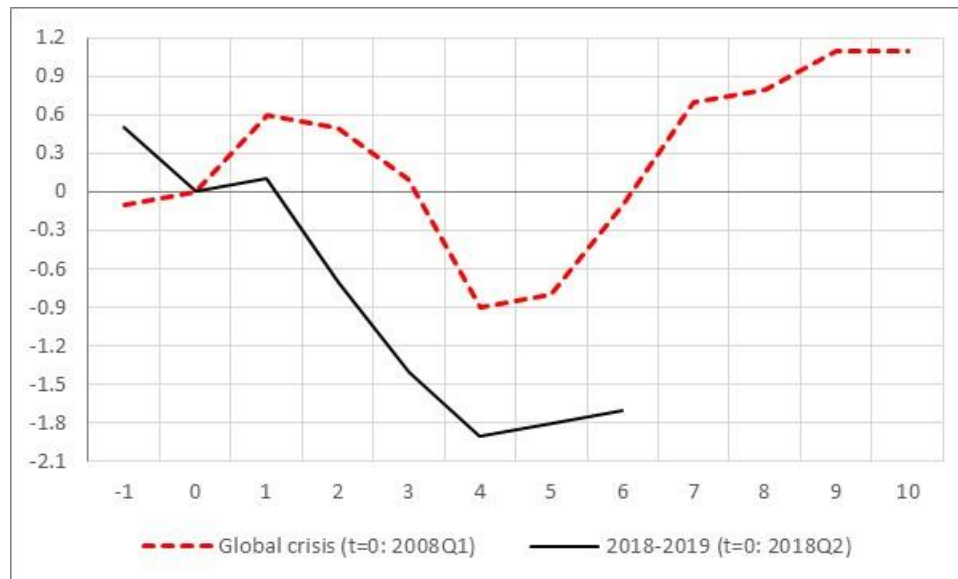


Figure 9. The change in the employment rate during the global financial crisis and 2018-19 crisis (changes are with respect to t=0, percentage points)

Source: Turkish Data Monitor

TABLE 3
GDP, Exports, Government Consumption Expenditures, and Value Added in Construction during Two Crises (Averages of Annualized Quarterly Growth Rates)

	2008Q2 – 2010Q2	2018Q3 – 2019Q3
GDP	-0.8	-0.3
Exports of goods and services	-3.7	10.2
Government consumption	2.2	3
Value added in construction	-3.6	-9.5
Δ Total employment (thousand person)	1412	-677
Δ Employment in construction (thousand person)	166	-539

Notes: For the global crisis episode: The pre-crisis peak level of GDP is observed in 2008Q1 (t=0 in Figure 8) and the first quarter in which the GDP exceeded its pre-crisis level is 2010Q3 (t= 10 in Figure 8). For the 2018-19 crisis episode: The pre-crisis peak level of GDP is observed in 2018Q2 (t=0 in Figure 8) and the first quarter in which the GDP exceeded its pre-crisis level is 2019Q4 (t= 6 in Figure 8). Δ is the first difference operator.

Source: Author's calculation based on data from Turkish Data Monitor.

TABLE 4
Boom and Bust in Construction Activity

	2007–2017	2010-2017	2018-2019
Construction permits (m ²) per capita (% change)	109.7	86.8	-77
Construction investment/total investment (change, pp)	15.3	8	-5.3
Employment in construction/total employment (change, pp)	2	2.7	-3.6
Value added in construction/GDP (change, pp)	1.3	0.9	-1.9

Source: Author's calculation based on data from Turkish Data Monitor.

TABLE 5
Credit Boom, Credit Crunch, and Non-performing Loans

	2007M12	2010M12	2017M12	2018Q2	2019M12
Share of construction credits (%)	7.5	7.9	10.5	10.5	10.6
Nonperforming construction loans ratio (%)	2.8	4.1	3.5	4.1	9.8
Share of nonperforming construction loans in total nonperforming loans (%)	6.2	9.1	12.2	14.1	19.3
Nonperforming non-construction loans ratio (%)	3.4	3.5	2.9	2.9	4.8
Real credit (construction) (2007M12=100)	100	148	409	440	397
Real credit (non-construction) (2017M12=100)	100	140	284	304	273

Notes: End of period values. 'M12' denotes December.

Source: Author's calculation based on data from Banking Regulation and Supervision Agency.

VI. DISCUSSION AND POLICY IMPLICATIONS

We first discuss domestic policy implications. One of the salient features of the Turkish economy is the low savings rate and the associated high liability dollarization. The average savings-to-GDP ratio was 23.6% of GDP in the period of 2010-2017, well below the average of emerging and developing economies which was 32.8%. Moreover, savings-to-GDP ratio falls short of the investment-to-GDP ratio of 29.1% which was again below the 32.3% average investment-to-GDP ratio of emerging and developing economies.²¹ Low savings rate and the large

²¹ Data are from the World Economic Outlook Database of the IMF.

gap between investment and savings render the Turkish economy vulnerable to a shift in risk appetite of foreign financial investors. During periods of surge in capital flows, if policymakers do not take preventive macro and micro-prudential measures, foreign currency debt build-up and a boom in loan supply occurs. This causes tremendous problems when capital inflows stop and more importantly during sharp reversals for economic agents with foreign currency mismatch in their balance sheets. Note also that financial market depth has connection with domestic savings rate. Caballero and Krishnamurthy (2003) present a model in which financial underdevelopment is associated with large foreign currency debt in balance sheets of NFCs. The first policy question that arises is how to increase the domestic savings rate. As documented elsewhere this is not an easy task (see, for example, World Bank, 2011).

This brings us to the second policy issue. Unconventional monetary policies of the central banks of large advanced economies, on the one hand, created significant policy problems -rapid credit growth and pressure for exchange rate appreciation-, it was an opportunity for governments to increase economic activity on the other hand. Turkish authorities allowed the growth rate to surpass the potential growth rate by not taking sufficient prudential measures to curb rapid credit expansion, with the exception of a short-lived attempts of the CBT and the BRSA.²² Conversely, Turkey eased foreign currency borrowing regulations. On July 11, 2009, residents were allowed to borrow in foreign currency indexed debt and sign other contracts in foreign currency, and a restriction on the maturity of pre-

²² See Table 1. Alper et al. (2018), Kara (2012), and Özatay (2011, 2012) discuss the repercussions of high credit growth on the conduct of monetary policy in the aftermath of the global crisis.

financing loans is loosened. The revisions stayed intact until January 25, 2018.²³ This was a significant policy mistake which paved the way for the 2018-19 crisis.²⁴

The third policy subject is related with how surges in foreign borrowing and domestic credit are utilized. In the Turkish case, as documented above, activity in a non-tradable sector –construction- had experienced a boom in the eve of the crisis and then a bust occurred in 2018 leading to a rather sharp loss of jobs. McCauley, McGuire, and Sushko (2015) draw attention to financial stability concerns that can arise from channeling external credit flows to leveraged real estate. Boom in real estate sector has also close connection with building bylaws and development plan laws. To the extent that they incentivize rent-seeking behavior a resource misallocation problem can arise. Consequently, there is an institutional dimension of the problem. A natural question that arises is how to lessen such misallocations by financial prudential policies and institutional reforms.

The fourth policy topic is the conduct of monetary policy. The impressions on the reluctance of the CBT to tighten the monetary policy and ensuing concerns about its independence together with the developments discussed in the preceding sections raised demand for foreign currency assets of the residents. The share of foreign currency deposits in M2 –an indicator of dollarization- increased to the record high level of 60% in October 2001. Since then it almost continuously declined, and reached 26.3% at the end of 2010. This was a significant positive achievement. However, it is short lived: it raised to 39% at the end of 2017 and to 46.8% in August 2018. It can be assessed that this fact and its underlying reasons increased vulnerabilities of the Turkish economy in the eve of the crisis as well.

A final policy subject is international policy coordination which is much-debated more often than it is seen. For example in his survey of international coordination,

²³ See Official Gazette numbers 26801 and 30312 for the relevant decrees.

²⁴ Ganioglu, Aytül (2016), for a sample of 24 advanced and 21 developing economies, shows that regulation and supervision weakness in the financial system plays a role in banking crises.

Eichengreen states that “the question is whether those who talk the talk also walk the walk” (Eichengreen, 2013). A similar statement can be found in Blanchard, Ostry, and Ghosh (2013): “international policy coordination is like the Loch Ness Monster – much discussed but rarely seen”. Bordo and Schenk (2017) provide experiences of coordination since the late nineteenth century. Agenor and Silva (2019) examine welfare gains from cooperation by employing a DSGE model and report that they are not large, but positive. Ostry and Ghosh (2013) stress the fact that despite welfare gains from policy coordination will not be huge, they are certainly measurable and worth pursuing. They further discuss obstacles on policy coordination and provide several proposals to overcome them. Taylor (2013) argues that near policy cooperation can be achieved by implementing rules-based monetary policies. Imisiker and Tas (2019) present evidence that communication among central bank governors in BIS Global Economy Meetings increases co-movement of policy actions of central banks. Notwithstanding these discussions, in the aftermath of the global financial crisis, policymakers of EMEs criticized monetary policies of advanced economies on the grounds that they pave the way for financial imbalances in EMEs and called for international policy coordination. The literature summarized in the introduction and Section III demonstrate how their concerns are well-founded.

VII. CONCLUSION

This study analyzes the 2018-19 economic crisis in Turkey. Since the global financial crisis, cross-border lending to EMEs has surged. Up to mid-2018, in Turkey, foreign currency debt and consequently currency mismatches in the balance sheets of the nonfinancial corporates had surged in the aftermath of the global financial crisis. This rendered them vulnerable to a stop in cross-border lending and depreciation of currency. Under these conditions, tightening of

monetary policy of large developed economies can trigger crisis in emerging market economies. Instead, the main triggering factor was several tweets of the president of the US which sharply increased risk perception for Turkey and led to a reversal of capital flows and sharp depreciation of currency. Consequently, the Turkish economy contracted and employment rate declined considerably. We argue that several economic policy mistakes paved the way to the crisis, and draw a number of economic policy lessons.

The first possible extension for future research is analyzing necessary institutional set-up to mitigate misallocation of cross-border flows to unproductive sectors. This is on the one hand related with prudential policies and a political economy problem on the other hand. The new institutional set-up should cope with rent-seeking behavior especially in the real estate sector. The second extension for future research is analyzing mechanisms to decrease dependence on foreign savings. This encompasses addressing low domestic savings problem and the subject of the first extension.

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