

BANK LENDING IN TURKEY: EFFECTS OF MONETARY AND FISCAL POLICIES

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Abstract

We study the impact of monetary and fiscal policies on credit growth in Turkey using bank-level data from the last quarter of 2002 to the first of 2008. We find evidence that the liquidity-constrained banks have sharper decline in lending during contractionary monetary policies and that crowding-out effect disappears more for banks with a retail-banking focus when the government adopts fiscal discipline. However, the results are statistically weak. Hence, the evidence is not strong enough to irrefutably document the bank lending channel and the impact of government finances on loan supply in Turkey even though these effects may be operational.

JEL Classification Numbers: G21, E44.

Keywords: Credit growth, monetary policy, fiscal policy.

I. INTRODUCTION

Both the Turkish banking sector and the overall economy have gone through considerable changes in the aftermath of the 2000-01 crisis. In the banking sector, on top of the massive consolidation and restructuring, regulations and supervision were improved, share of state ownership as well as distortionary taxes were reduced, and new financial products such as mortgages and associated prudential regulation were introduced. The macroeconomic scene also changed dramatically with monetary authorities adopting an inflation targeting policy to reduce the double-digit inflation rate (around 70 percent by end-2001) to single digits. Additionally, the government has applied a prudent fiscal policy to reduce its overall debt, with a commitment to run a primary surplus of 6.5 percent of GDP.²

Such changes bring attention to an old but fundamental question: How do macroeconomic policies affect the availability of credit to the private sector? In particular, is the bank lending channel for monetary transmission effective by changing the cost of external funds and liquidity constraints? And, does a decline in government financing leaves more loans accessible for private residents as banks move away from money market trades to retail banking activities? This paper explores these questions by analyzing the impact of monetary and fiscal policies on Turkish banks' lending in the post-crisis period.

To analyze the impact of monetary policy on credit growth in Turkey, we build upon the methodology introduced by Kashyap and Stein (2000). They test the impact of monetary policy on loan growth using a two-step regression approach. The argument is that banks cannot, without friction, substitute sources to fund loans to make up for a monetary-policy-induced shortage in available funds. But not all banks are constrained at the same degree. Less liquid banks and smaller banks, which are more likely to have limited access to external funding sources, should be affected more. Using this cross-sectional variation, we can detect the impact of monetary policy on loan supply.

Building upon the Kashyap-Stein methodology, we also consider the effects of fiscal policy on bank lending. These are likely to be particularly important in Turkey and other emerging markets, where large government deficits tend to be financed through short-term debt in domestic markets. Under such circumstances, economic theory posits that the government "crowds out" the private sector in credit markets: lax fiscal policy would be related to a slow-down in the growth of bank credit to the private sector. Again utilizing cross-sectional variation, we argue that banks that have a retail-banking focus in place should have larger loan growth when contractionary fiscal policy comes into effect while those that are more active in funding the budget deficit would have a harder time to adjust. This argument is supported by the literature on relationship banking, which conjectures that the cost of obtaining private information about the borrower and the benefits of repeated deals with the same party make it worthwhile to invest in creating such relationships.³ For our purposes,

banks that rely less on income generated by money market operations to finance government debt and more on income generated through loans to private clients are more likely to develop relationships. Therefore, one could look at the differences among banks with varying reliance on money market operations in their business model and the weight of private-sector loans in their portfolio, to find out the impact of fiscal discipline on loan supply.

Our main specification asserts that loan supply is a function of monetary and fiscal variables. Under this specification, a contractionary monetary policy reduces banks' loan supply; and this effect would be more pronounced for small banks with lower liquidity ratios, as they cut back down on their lending more than other banks, when faced with monetary tightening. Such a finding would provide evidence in support of bank lending channel being in effect. A contractionary fiscal policy, on the other hand, would free bank assets previously invested in government securities, and hence, lead to an increase in loan supply. This effect would be more pronounced for banks that have already established a presence in the private loan market. In other words, crowding-out would be diminished and banks that have comparative advantage in catering to the private sector would benefit from a contractionary fiscal policy more than others can. Using quarterly data on all banks that are active in Turkey between 2002Q4 and 2008Q1, we test these assertions.⁴

We find some evidence supporting both, yet the results do not exhibit statistical significance in a robust manner. The results, as expected, show that a contractionary monetary policy restricts, in particular, the domestic-currency-denominated and medium-to-long term credit supply. On the other hand, it has little power in restricting the foreign-currency-denominated loans and has very limited impact on restricting the loan supply of foreign banks. Furthermore, a monetary contraction leads banks to extend more credit in shorter maturity since short-term credit is less likely to induce maturity mismatches, and hence, is less sensitive to a decline in funding sources. In fact, it is likely to be the case that banks substitute shorter for longer maturity loans in an effort to keep the overall credit supply less affected and/or to maintain their liquidity ratios at the desired level. Nevertheless, these findings are statistically weak, leaving us without proper documentation of a bank lending channel of monetary policy in Turkey. Fiscal policy impact also varies depending on bank ownership and the type of loans. The results show that fiscal policy crowds out only the domestic-currency-denominated credit provided by domestic banks, indicating that it has limited impact on foreign banks and credit extended in foreign currencies. Similar to a contractionary monetary policy, fiscal tightening leads banks to extend more of shorter term credit; and undermines the importance of retail banking as a business focus, since these loans require less scrutiny when it comes to credit risk assessment.⁵

In the absence of compelling evidence, we conclude that bank lending channel of monetary policy transmission may be weak in Turkey during our sample period while fiscal policy may

have some impact but only on certain type of loans extended by a particular group of banks. This evidence adds to the literature that looks into the bank lending channel in emerging markets such as Şengönül and Thorbecke (2005), Arena, Vázquez, and Reinhart (2007), and Brooks (2007), challenging some of the results reported in these papers on the existence of a bank lending channel of monetary policy transmission mechanism in Turkey and providing new insights on whether different group of banks respond to changes in policy stance differently. In particular, our findings suggest that empirical results of previous studies on bank lending channel in Turkey may not be valid post-2001. One reason may be the change in the funding sources of banks: during the global liquidity years, banks might have relied less on deposit-funding as it was easier to access funds offered by non-traditional sources. Hence, evidence of a bank lending channel during this period may be harder to detect although the channel itself may be operational. These findings may also suggest that factors other than monetary and public policies might have weighed on the development of private credit markets in Turkey. We also contribute to the literature since, to the best of our knowledge, this is one of the first papers analyzing the impact of fiscal policy on bank credit to the private sector and the first to do so in a setting that distinguishes supply- and demand-side effects and isolates supply-side responses. Moreover, we employ a seemingly unrelated equation framework recognizing the interaction between monetary and fiscal policies.

The rest of the paper is organized as follows. Section II gives a brief account of the Turkish economy and the banking sector as well as the literature on macroeconomic policies and bank lending activity in juxtaposition to this study. Section III describes the data and lays out the methodology. Empirical results are in Section IV. Finally, Section V concludes.

II. BACKGROUND

A. Turkish Economy and Banking Sector

Turkey has a long history of double-digit and persistent inflation rate accompanied with frequently and severely disrupted growth dynamics (İsmihan and Metin-Özcan, 2009). Large size of the government, coupled with an ineffective tax system, led public debt become one of the highest among the country's peers, and government policies often aimed little more than maintaining the ability to roll over the debt in the short run.⁶ Banking sector, as a result, heavily relied on money market operations to finance public sector borrowing in their business model rather than focusing on retail banking activities. This business model left banks severely exposed to direct interest rate and indirect exchange rate risks, and, not surprisingly, macroeconomic shocks hit banks hard and lending to the private sector exhibited severe and frequent oscillations (Figure 1).

Following the 2000-01 crisis, the monetary and fiscal policies changed drastically.⁷ In 2001, the government set out an IMF-backed 3-year stabilization program and committed to

strengthen its balance sheet position.⁸ Concurrently, the central bank adopted a strong disinflation program and the inflation rate, hovering around 70 percent at the time, was reduced to single digits by the end of 2004. The banking sector also went through considerable change at the back of initiatives to increase resiliency and supervision quality. A series of banking laws, bringing regulations closer to the European Union and other international standards, were enacted (e.g. the establishment of the autonomous Banking Regulation and Supervision Agency (BRSA) in June 1999, the separation of the management of the Savings Deposits Insurance Fund (SDIF) from that of the BRSA in December 2003, and the voluntary out-of-court debt restructuring in January 2002).

As of December 2007, there were 46 banks operating in Turkey, with deposit banks accounting for the bulk (Table 1).⁹ Domestic private banks constitute slightly more than half of the banking sector in terms of market share. The banking sector assets amount to around 60 percent of GDP while the whole financial system assets are about 70 percent of GDP. While both the relatively large number of banks and the Herfindahl-Hirschman index, at 0.09, suggest a high degree of competition, the share of top 5 banks command almost two-thirds of the market. In addition to high concentration, the banking sector, despite the quick wave of acquisitions of previously domestically owned banks by foreigners following the crisis, remains mostly domestic, especially relative to other emerging markets (BIS, 2006; IMF, 2007). Public involvement also remains high comprising around a third of the sector assets. The sample includes several mergers and acquisitions as well as exit of some banks as a consequence of restructuring efforts (Table 2; more details on this issue in Section III.A).

B. Related Literature

There is a substantial body of theoretical and empirical research indicating that monetary policy transmits to the economy in channels other than the straightforward interest rate channel. Bernanke and Gertler (1995) point out that the impact of monetary policy on the economy is larger than that implied by the interest elasticity of consumption and investment. The most-widely-studied explanation for this is the possibility that contractionary monetary policy decreases the core deposit funding for loans, leading some banks to reduce lending as they may be unable to raise funds elsewhere. Kashyap and Stein (2000) look at the bank lending channel of monetary transmission for the U.S. commercial banks from 1976 to 1993. They employ a two-step regression approach to estimate the effect of liquidity on loan growth and the impact of monetary policy on the liquidity of a bank. They show that monetary policy has significant effects on banks with less liquid balance sheets, and this effect is even stronger for small-sized banks. Şengönül and Thorbecke (2005) apply this methodology to Turkey during the period 1997—2001. They show that the lending channel of monetary transmission exists in Turkey. Brooks (2007) studies the monetary transmission during the May-June 2006 financial turbulence in Turkey. By applying a difference-in-difference approach, she shows that bank liquidity affects loan supply. The latter two studies

finding significant monetary policy transmission mechanism in Turkey could be due to that both studies focus on exceptional periods of macroeconomic or financial turmoil.

While the literature on the bank lending channel of monetary transmission mechanism is vast, less attention has been paid to the implications of fiscal policy on bank credit supply to the private sector. High level of public debt has been blamed as a major source of disruption (see, for instance, McHale, 2001) yet formal studies of these assertions are somewhat scant. Değirmen (2007) shows that, relying on descriptive statistics and impulse responses, public sector borrowing reduced lending by state-owned banks in Turkey during the 1990s. Our paper, in contrast, employs a different and more structured empirical approach to study the impact of fiscal policy changes. Hauner (2008) study the impact of credit to government on banking sector performance by using a panel data set for 142 countries. One of the measures of banking sector performance he uses is the growth rate of bank-credit-to-GDP ratio, on which credit-to-government has a negative impact in developing countries. However, supply- and demand-side effects are not separated in arriving at this result.

III. DATA AND METHODOLOGY

A. Data

Bank-level data are obtained from the Banks Association of Turkey (TBB). In this database, information on balance sheets and income statements is available from 1988 onwards. However, between 1988 and 2007, Turkish banks have used three different accounting systems, and the financial statements have been reported in three different styles based on the level of detail. Only by December 2002, accounts have begun to be reported under consolidated and unconsolidated statements. Our analysis uses unconsolidated balance sheets and income statements, reported quarterly, from December 2002 to March 2008.¹⁰

Measures for monetary and fiscal policies are collected from the *International Financial Statistics* and *World Economic Outlook* publications of the IMF. However, a majority of the fiscal variables are available only at annual frequency. Therefore, we interpolate quarterly data from the annual series but, to ensure robustness, also gather information on fiscal policy variables at quarterly frequency from the Turkish Undersecretariat of Treasury.

Several data issues deserve detailed explanation. These concern inflation accounting, seasonality, mergers and acquisitions, outliers, and measurement of the key concepts, namely, liquidity and retail-banking focus and the policy variables.¹¹

- Inflation adjustment: During 2000-04, banks reported balance sheets with respect to the inflation adjustment communiqué of the BRSA. As the chronically high inflation rate reduced to single digits by 2004, BRSA announced in its 2005/5 circular that

inflation adjustment will be ceased from balance sheet reporting standards starting from January 1, 2005. Therefore, we adjust bank-year balance sheet data from 2005 onwards with the end-of-period inflation rate.

- Seasonality: All variables that exhibit seasonal fluctuations are smoothed quarterly to eliminate seasonal effects.
- Mergers and acquisitions may inflate the balance sheet of acquiring banks, hence we drop bank-year observation with credit growth higher than 200 percent.
- Outliers: In micro-level data, outliers can change the size and/or sign of the estimated coefficients. To avoid this, observations that are two or more standard deviation away from rolling-window time-variant means are defined as outlier, and dropped out.
- Measuring liquidity: We employ two alternative liquidity measures. First is the liquidity measure as defined by the Banks Association of Turkey. This measure includes cash and balances with the central bank, financial assets where fair value change is reflected to income statement (net) with banks and other financial institutions, money market securities, and financial assets available for sale (net). As the 2007-08 financial crisis has proved, some of the items that were previously considered liquid may become rather illiquid during a market downturn. So, our second measure includes only cash and balances with the central bank and money market securities and excludes any financial assets that may be subject to fire-sale prices. Also, in Turkey, public sector debt securities constitute the majority of the banking sector financial assets; therefore, this variable may as well be affected by the impact of fiscal policy.
- Retail-banking focus variable: The measure we use as a proxy for the role of retail banking activities versus money market trades, which are dominated by government securities, is constructed based on banks' loan activities in proportion to their overall assets. The retail-banking focus variable, thus, assigns values to each bank based on the proportion of its loan-to-asset ratio to the average loan-to-asset ratio of the banking sector for a given year. The idea is that banks that devote proportionately more resources to extending loans to the private sector are more likely to have and further expand their operational and informational advantages in dealing with the same or similar borrowers repeatedly. Hence, those banks that are ranked higher with respect to this measure would have a retail-banking focus in place.^{12,13}
- Measures of policy stance: Finding variables that would indicate how tight monetary and fiscal policy stances have been is not an easy task, especially in Turkey during our period of study when policy frameworks have gone through big changes.¹⁴ Rather than picking one variable for each and arguing that it is the best one, we use three

alternative measures for each of the policies. Monetary policy measures are the annual inflation rate based on the consumer price index, the discount rate, and the interbank money market lending rate while fiscal policy measures are general government gross debt-to-GDP ratio, primary surplus as a percent of GDP, and domestic general government debt-to-GDP. In results not reported for brevity, we also use the cyclically-adjusted deficit to capture only the discretionary part of the fiscal policy choice and the results remain virtually the same. Yet, given the caveats on estimating this measure of fiscal policy stance in Turkey, we only report the results with more conventional measures. Note that Turkey has been transitioning into inflation targeting during the sample period (Ersel and Özatay, 2008), making an analogous measure for monetary policy hard to define. Our rationale for the choice of policy stance measures aims to capture not only the tightness of the policy position but also the economic conditions these policy position were able to attain. In other words, we seek to see the impact of the ‘successful macroeconomic policies’ that, to many, defined our sample period. For instance, taking an unconventional route and using the inflation rate as a policy variable allows us to assess how the success of monetary policy in anchoring inflation expectations and bringing down the inflation rate may have affected the loan supply decisions of private banks.

Table 3 provides the summary statistics. Our empirical approach requires enough cross-sectional variation in variables measuring liquidity and retail-banking focus. These statistics verify that there is enough variation to distinguish among banks and use the differences in their responses to policy changes to identify the impact of policies on lending from the supply side alone. It is interesting to note that foreign banks, especially those incorporated as branches rather than subsidiaries, expanded credit faster than other banks did in this period. More strikingly, most of the acceleration in credit growth comes from foreign-currency-denominated loans. A final observation is that medium- and long-term credit has grown faster, probably reflecting the changes in the macroeconomic environment, in particular, the decline in uncertainty and improvement in risk management as a result of financial development. Another factor that might be in effect is the introduction of certain types of loans such as home mortgages in the sample period. Yet, another explanation behind this observation could be that lending standards have declined as in some cases extending the term of a loan might make it more affordable to less qualified borrowers. Given the initially low level of financial intermediation, we believe the latter explanation is less likely to have relevance compared to the first two.

B. Methodology

Our first hypothesis is that contractionary monetary policy leads to a decline in credit growth, by increasing the cost of external funds, more for banks that face tighter liquidity constraints.

$$\frac{\partial^2 cg_{it}}{\partial L_{it} \partial M_t} < 0, \text{ where } cg_{it} \text{ is the credit growth of bank } i \text{ at}$$

time t , L_{it} is the liquidity ratio and M_t is the monetary policy at time t . Higher values of L_{it} indicate higher liquidity and lower values of M_t indicate tighter monetary policy. In this

context, $\left(\frac{\partial cg_{it}}{\partial L_{it}}\right)$ reflects the liquidity constraint of a bank: in other words, the hypothesis

suggests that liquid banks can raise loans more easily than less liquid banks can. The second derivative, therefore, tells us that tighter monetary policy ($\downarrow M_t$) should further increase the importance of liquidity constraint on bank lending $\left[\uparrow \left(\frac{\partial cg_{it}}{\partial L_{it}}\right)\right]$. These effects should be more

pronounced for smaller banks since they would be more likely to face constraints in accessing external funds.

Our second hypothesis is that contractionary fiscal policy increases credit growth, through freeing up of the resources used to earn income from investing in government securities, more for banks with retail banking in their business focus. More specifically, we test

whether $\frac{\partial^2 cg_{it}}{\partial R_{it} \partial F_t} < 0$, where R_{it} is the measure for retail-banking focus of a bank and F_t is

the fiscal policy at time t . Higher values of R_{it} indicate more retail-banking focus whereas

lower values of F_t indicate tighter fiscal policy. The first derivative $\left(\frac{\partial cg_{it}}{\partial R_{it}}\right)$ signals the

importance of retail business focus on credit growth. In other words, banks with more retail-banking focus should be able to increase their loans to the private sector more and/or faster than others. The second derivative of credit growth shows that as fiscal policy tightens ($\downarrow F_t$),

corresponding to a decline in the government's need to use private sector savings to finance public spending, banks increase the amount that they lend to the private sector; and this effect

would be higher for banks with retail-banking in focus $\left[\uparrow \left(\frac{\partial cg_{it}}{\partial R_{it}}\right)\right]$. Existing relationships

with the client base would provide retail-focused banks with a comparative advantage in extending more of these types of loans, and would lead them ahead of the banks that do not enjoy such pre-existing conditions.

We adopt a two-step regression approach similar to the one used by Kashyap and Stein (2000) in order to quantify the impact of policy stance on lending. In addition to the monetary policy effect that Kashyap and Stein (2000) consider, we also look at the fiscal

$$\frac{\partial cg_{it}}{\partial L_{it}} \text{ and } \frac{\partial cg_{it}}{\partial R_{it}}. \text{ While estimating}$$

the impact of liquidity and retail-banking focus on credit growth, we also consider that banks may exhibit differences with respect to their ownership types. To take this into regard, we distinguish between public, foreign, and private domestic ownership types in step-one estimations. Hence, the regression equation in the first step is

$$cg_{it} = cg_{it-1} + \alpha_t L_{it-1} + \gamma_t R_{it-1} + \delta^f f_{it} + \delta^s s_{it} + \omega_{it} \quad (1)$$

where cg_{it} is the percentage change in the quarterly outstanding loans extended by bank i at time t ; f_{it} and s_{it} are the foreign and state ownership dummies, respectively; and ω_{it} is the heteroskedasticity-adjusted error term. The coefficients of interest are α_t and γ_t , which represent the first derivatives of loan supply with respect to liquidity and retail-banking focus, respectively. After estimating α_t and γ_t from Equation (1), we jointly estimate the second derivatives of credit growth by using the seemingly unrelated regression model given as

$$\begin{bmatrix} \hat{\alpha} \\ \hat{\gamma} \end{bmatrix} = \begin{bmatrix} X_M & 0 \\ 0 & X_F \end{bmatrix} \begin{bmatrix} \beta_M \\ \beta_F \end{bmatrix} + \begin{bmatrix} \varepsilon_M \\ \varepsilon_F \end{bmatrix} \quad (2)$$

where

$$X_M \beta_M = \begin{bmatrix} 1 & M_{1,0} & \dots & M_{1,4} & t_1 \\ \vdots & \vdots & & \vdots & \vdots \\ 1 & M_{T,0} & \dots & M_{T,4} & t_T \end{bmatrix} \begin{bmatrix} c \\ \phi_0 \\ \vdots \\ \phi_4 \\ \delta^t \end{bmatrix} \text{ for the univariate specification, and}$$

$$X_M \beta_M = \begin{bmatrix} 1 & M_{1,0} & \dots & M_{1,4} & t_1 & g_1 \\ \vdots & \vdots & & \vdots & \vdots & \vdots \\ 1 & M_{T,0} & \dots & M_{T,4} & t_T & g_T \end{bmatrix} \begin{bmatrix} c \\ \phi_0 \\ \vdots \\ \phi_4 \\ \delta^t \\ \delta^g \end{bmatrix} \text{ for the bivariate specification;}$$

and the error terms are such that

$$E[\varepsilon|X_M, X_F] = 0$$

$$E[\varepsilon\varepsilon'|X_M, X_F] = \Omega$$

In Equation (2), M_t and F_t are the variables controlling for monetary and fiscal policy variables, respectively; t_t is the time variable; and g_t is the real GDP growth rate in that quarter. Real GDP growth rate is included to control for the position in the business cycle. In step-two regressions, we consider five lags of the monetary and fiscal policy variables: all the lags from lag zero to lag four.

Note that the implicit assumption for the supply and demand effects to be separated in this framework is that all banks are affected in the same way by demand shocks. By focusing on the variation among banks in the supply constraints they may be facing, our methodology attributes the cross-sectional differences in bank loans to a supply effect in response to changes in the policy stance provided that all banks face the same fluctuations in their loan demand. This identification strategy distinguishes our paper from others in the literature, especially with regards to studies of fiscal policy and loan supply (see Section II.B).

IV. EMPIRICAL RESULTS

A. Baseline Results

Table 4 presents the baseline results of our empirical analysis. In order to present the results in a compact manner, only one coefficient, with the associated standard error, from each regression is shown: the sum of coefficient estimates of the monetary and fiscal policy indicators from the second step of the two-step approach given in Equation (2). The statistics for testing whether the sum of the policy indicators are less than zero are reported in the form of heteroskedasticity-adjusted standard errors. This coefficient is reported both for the univariate and bivariate second-step estimation methods as depicted in Equation (2) (columns II, IV, VI, and VIII). The table is split into two panels. Panel A shows the results using the *broader* liquidity measure, ‘Liquidity (1)’, in the first-step estimation given in Equation (1) and Panel B using the *narrower* liquidity measure, ‘Liquidity (2)’. Further, each panel uses three variations of monetary and fiscal policy variables for the second step estimation.¹⁵

Each panel of Table 4 are divided into two sections: on the left-hand-side (columns I through IV), each panel shows the sum of the coefficients on the monetary and fiscal policy indicators for all banks operating in Turkey, and, on the right-hand-side (columns V through VIII), the results are reported only for the sample of commercial banks. Even though small by share, some of the development and investment banks also provide credit in Turkey. Therefore, results are shown both for all banks, covering the credit growth in the banking sector in Turkey as a whole, and for commercial banks only (which constitute the bulk of the

banking system and specialize in providing loans to *both* persons and corporations as opposed to the development and investment banks), to observe any differences across bank types. Lastly, estimation results are calculated first for all banks in a given group and then for small banks (rows II, IV, VI, VIII, X, and XII). Small banks are the ones which are in the lower 95th percentile in terms of the size – measured by total assets of a bank - distribution of the total banking sector in a given year.¹⁶

In general, the coefficients for monetary policy indicators have negative signs as expected, however, with low significance levels. The coefficients for the fiscal indicators, on the other hand, do not obtain a robust sign in this specification. The policy variables have higher significance levels when step-one regression is estimated using Liquidity (2). In fact, the only significant results at conventional levels are obtained with this measure. This may indicate the biases that Liquidity (1) may inhere due to its wide coverage. As aforementioned, Liquidity (1) captures also holdings of government debt securities and could be seen as a hybrid measure of both liquidity and (inverse of) focus in retail banking activities. This could explain why the broader measure of liquidity does not give any significant coefficient estimates. The results reported in the rest of the analysis rely on the *narrower* Liquidity (2).

The negative coefficients on the monetary policy indicator are only for inflation and discount rates (row VII, column II; row IX, column II). Conversely, a positive and significant coefficient is estimated for the interbank rate for all banks (row XI, column II). These results indicate two important observations. First, monetary policy may be better captured through inflation and discount rates, reflecting the supply-side impact of monetary policy on bank lending. On the other hand, the interbank rate seems to work more as a financial deepening variable: a decline in this rate corresponds to an increase in the importance of liquidity in bank loan creation, possibly through the use of interbank lending. Second, the insignificance of the interbank coefficient estimated for commercial banks show that the impact of this variable is likely to be stronger on development and investment banks.

Fiscal policy indicators do not provide robust results (columns III, IV, VII, and VIII). One reason may be because deseasonalized and interpolated data may lead to Type II errors. Having said that, the only negative and significant coefficient estimates are obtained for gross debt-to-GDP ratio for commercial banks (compare row VIII, column VIII to row VII, column VIII). This finding indicates that a decline in public debt frees up resources and enhances credit supply by small, commercial banks. The impact of monetary policy also appears to be more pronounced for loan supply by small banks. The sums of the coefficient estimates of policy variables appear to be more negative for small banks and they have a higher significance level (compare row X, column VI to row IX, column VI). This is in line with small banks being more constrained in terms of access to financial markets during tighter monetary policy and of ability to reach a broader customer base (geographically

and/or on borrowers engaged in certain types of economic activity) in case of a switch in their business focus, i.e., a switch from financing government debt to lending to the private sector. Therefore, monetary and fiscal policies affect small banks more than they do the larger ones.

B. Breaking Down Loans by Currency Denomination

In this section, we apply the two-step methodology separately for loans extended in domestic and foreign currencies. The results are reported in Table 5, which has the same layout as that of Table 4 except that Panel A now shows the estimation results for loans denominated in the domestic currency while Panel B presents the results for loans denominated in foreign currencies. In all first-step regressions, the liquidity measure is Liquidity (2).

The results in Table 5 show that the monetary policy is much stronger for loans extended in domestic currency: both the magnitude and significance level of coefficient estimates of inflation and discount rates as monetary policy indicators are larger than those for loans extended in foreign currency (compare, e.g., row III, column II to row IX, column II). This indicates that a tightening of monetary policy restricts domestic-currency credit growth in banks, and this constraint gets stronger for less liquid and smaller banks. For loans extended in foreign currencies, monetary policy indicators do not yield as significant results. This suggests that monetary policy may be ineffective in limiting the supply of foreign credit, raising issues for the monetary authority in a small, open economy to control private sector borrowing in foreign currencies by monetary tightening.

Interbank rate, on the other hand, works in the same direction for both types of loans (compare row V, column II to row XI, column II). As aforementioned, this indicator may be capturing more of financial deepening rather than of monetary tightening, and hence, it is not surprising to see a similar impact independent of the currency denomination of the loan. When financial markets lose depth in the sense that interbank funding becomes less accessible, banks find it harder to supply credit to the private sector and this is especially the case for less liquid and smaller banks (compare row XII to row XI in column II).

Fiscal policy indicator is significant only for loans extended in domestic currency, and it yields negative and significant coefficients for gross debt-to-GDP and primary surplus ratios (rows I and II in columns VII and VIII; rows III in columns III and IV). These results have two important indications. First, government's financing need may reduce bank loan supply available to the private sector and fiscal discipline may increase this supply. Second, supply of loans to the private sector denominated in foreign currency may be independent of banks' government debt financing, potentially indicating that the spread between domestic and foreign interest rates is probably the main supply-side factor for these types of loans.

Last, it is also worth noting that univariate estimation approach does not reveal many of these effects while the bivariate approach, by taking the situation of the economy into account, unveils the impact of policy stance on banks' lending.

C. Breaking Down Loans by Maturity

In this section, we study the impact of monetary and fiscal policy on loan supply with respect to the maturity structure of the loans. The results are reported in Table 6, with a similar layout as that of Table 5 except that Panel A now presents the results for loans with short-term maturity while Panel B shows the results for medium-to-long-term loans.

The results confirm that the impact of monetary policy, through inflation rate, on longer term loans is in line with our hypothesis: monetary tightening reduces the supply of longer term loans (rows VII and VIII in column II). Yet, significant and positive coefficients emerge for short-term loans extended by commercial banks. This may suggest that, as monetary policy tightens, it leads banks to extend less of long-term and more of short-term loans. Notice also that these results are in line with inflation expectations: banks may take tightening as an indicator of higher inflationary pressures over a foreseeable period of time and protect against higher potential inflation by shifting the maturity structure of their loan portfolio.

Fiscal policy seems not to affect the long-term loan supply of banks, but the short-term loan supply. The results indeed deliver positive and significant coefficient estimates for fiscal policy variables measured in terms of the ratios of primary surplus and domestic debt-to-GDP (compare rows III-VI to rows VII-X in columns III and IV). This may indicate that the retail-banking focus for a bank is less important in extending loans of shorter maturity; and indeed many banks that do not have a retail-banking business focus may prefer to extend shorter term loans, probably because these are less prone to mistakes in risk management at which these banks might have a disadvantage, when the government reduces its domestic debt financing need from banks.

D. Breaking Down Loans by Bank Ownership

Finally, we apply the two-step methodology to the loan supply by foreign banks. The results, obtained by using Liquidity (2) in step-one estimations, are reported in Table 7. The table is divided into three panels, where Panel A, B, and C show the results for all loans, for loans extended in domestic currency, and for loans extended in foreign currency, respectively. Each row shows the results for alternative measures of monetary and fiscal policy. Unfortunately, due to data limitations, we cannot employ the analysis with respect to the maturity structure of loans for foreign banks operating in Turkey.

Monetary policy indicators generally have the expected negative sign for foreign banks, however, these are significant at conventional levels only for the inflation rate and in the case of foreign-currency-denominated loans (row VII, columns I-II). Comparing these to the results in Table 5, we see that this is not the case in the regressions that use the whole sample (see Table 5, Panel B, rows VII and VIII). This difference is likely to stem from the fact that these banks and these types of loans are the ones that tend to be more constrained in their access to the external financing sources because of their size and more specialized in the way they work with particular borrowers and/or have a more advanced management system through implementation of techniques from their parent banks. Because of these characteristics, monetary policy might have a more pronounced impact for foreign-currency-denominated loans of foreign banks.

There appears to be little evidence of fiscal policy being effective on the growth of foreign banks' credit supply, either in total or in terms of currency denomination of the loans. The coefficients on fiscal policy indicators switch signs and attain statistical significance in a few cases and only at the 10 percent level. This may support the view that foreign banks enter to the Turkish market because of higher economic growth prospects and lower competition, compared to the circumstances in their home markets, rather than solely investing in government securities to finance public debt.

V. CONCLUSION

We study the impact of monetary and fiscal policies on the growth of credit to the private sector in Turkey. By gathering detailed bank-level data from the last quarter of 2002 to the first of 2008, we are able to use the cross-sectional variation in banks' liquidity positions and business models to disentangle the supply- and demand-side effects. We show that the liquidity-constrained banks have sharper decline in lending during contractionary monetary policies and that crowding-out effect disappears more for banks with a retail-banking focus already in place when the government adopts fiscal discipline. These findings suggest that bank lending channel of monetary policy and fiscal policy transmission is particularly important for credit denominated in domestic currency. Furthermore, a contraction in any of these policies leads banks to extend more of short-term credit as the importance of liquidity constraints and retail-banking focus diminishes for loans at short-term maturity. Lastly, the impacts of monetary and fiscal policies are limited for loans extended in foreign currencies and for foreign banks.

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Table 1. Banks by Market Share

	Market share based on				Market share based on		
	Total assets	Total loans	Total deposits		Total assets	Total loans	Total deposits
Deposit banks	96.6	95.9	100.0	Foreign banks	15.0	18.8	14.4
Domestic public banks	29.2	22.5	35.8	ABN AMRO Bank N.V.	0.2	0.1	0.1
Türkiye Cumhuriyeti Ziraat Bankası	14.4	7.7	19.1	Arap Türk Bankası A.Ş.	0.1	0.0	0.0
Türkiye Halk Bankası A.Ş.	7.2	6.5	8.6	Bank Mellat	0.0	0.0	0.0
Türkiye Vakıflar Bankası T.A.O.	7.6	8.4	8.1	Citibank A.Ş.	0.7	0.7	0.9
Domestic private banks	52.3	54.6	49.7	Denizbank A.Ş.	2.7	3.7	2.6
Adabank A.Ş.	0.0	0.0	0.0	Deutsche Bank A.Ş.	0.1	0.1	0.1
Akbank T.A.Ş.	12.2	13.2	11.5	Eurobank Tekfen A.Ş.	0.5	0.3	0.3
Alternatif Bank A.Ş.	0.5	0.7	0.5	Finans Bank A.Ş.	3.7	5.1	3.6
Anadolubank A.Ş.	0.5	0.6	0.5	Fortis Bank A.Ş.	1.8	2.0	1.6
Şekerbank T.A.Ş.	1.1	1.3	1.2	Habib Bank Limited	0.0	0.0	0.0
Tekstil Bankası A.Ş.	0.5	0.7	0.4	HSBC Bank A.Ş.	2.4	3.3	2.1
Turkish Bank A.Ş.	0.1	0.0	0.1	JPMorgan Chase Bank N.A.	0.0	0.0	0.0
Türk Ekonomi Bankası A.Ş.	2.1	2.4	2.0	Millenium Bank A.Ş.	0.2	0.3	0.3
Türkiye Garanti Bankası A.Ş.	12.0	13.3	11.0	Oyak Bank A.Ş.	2.2	3.0	2.5
Türkiye İş Bankası A.Ş.	14.3	12.1	13.6	Société Générale (SA)	0.1	0.0	0.0
Yapı ve Kredi Bankası A.Ş.	9.0	10.2	9.0	Turkland Bank A.Ş.	0.1	0.1	0.1
Banks under SDIF	0.2	0.0	0.0	Unicredit Banca di Roma S.p.A.	0.0	0.0	0.0
Birleşik Fon Bankası A.Ş.	0.2	0.0	0.0	WestLB AG	0.2	0.0	0.2
				Development and investment banks	3.4	4.1	-
				BankPozitif Kredi ve Kalkınma Bankası A.Ş.	0.2	0.3	-
				Calyon Yatırım Bankası Türk A.Ş.	0.0	0.0	-
				Çalık Yatırım Bankası A.Ş.	0.0	0.0	-
				Diler Yatırım Bankası A.Ş.	0.0	0.0	-
				GSD Yatırım Bankası A.Ş.	0.0	0.0	-
				İller Bankası	1.0	1.5	-
				İMKB Takas ve Saklama Bankası A.Ş.	0.2	0.0	-
				Merrill Lynch Yatırım Bank A.Ş.	0.0	0.0	-
				Nurol Yatırım Bankası A.Ş.	0.0	0.0	-
				Taib Yatırım Bank A.Ş.	0.0	0.0	-
				Türk Eximbank	0.7	1.2	-
				Türkiye Kalkınma Bankası A.Ş.	0.1	0.1	-
				Türkiye Sınai Kalkınma Bankası A.Ş.	0.9	0.9	-

Data from Bankers Association of Turkey as of December 2007; market shares expressed in percent.

Table 2. Banks in the Sample

Bank Name	Type	Ownership	Notes	Bank Name	Type	Ownership	Notes
ABN AMRO Bank N.V.	Deposit	Foreign branch		JPMorgan Chase Bank N.A.	Deposit	Foreign branch	
Adabank A.Ş.	Deposit	Domestic private		Koçbank A.Ş.	Deposit	Domestic private	Acquired by Yapı ve Kredi Bankası A.Ş. in 2006
Ak Uluslararası Bankası A.Ş.	Deposit	Foreign subsidiary	Acquired by Akbank T.A.Ş. in 2005	Merrill Lynch Yatırım Bank A.Ş.	Dev. & Inv.	Foreign subsidiary	Used to be a domestic private bank (Tat Yatırım Bankası A.Ş.), sold to Merrill Lynch European Asset Holdings, Inc. in 2006
Akbank T.A.Ş.	Deposit	Domestic private		Millennium Bank A.Ş.	Deposit	Foreign subsidiary	
Alternatif Bank A.Ş.	Deposit	Domestic private		Nurol Yatırım Bankası A.Ş.	Dev. & Inv.	Domestic private	
Anadolubank A.Ş.	Deposit	Domestic private		Oyak Bank A.Ş.	Deposit	Foreign subsidiary	Used to be a domestic private bank, sold to ING Bank N.V. in 2008
Arap Türk Bankası A.Ş.	Deposit	Foreign subsidiary		Pamukbank T.A.Ş.	Deposit	Domestic public	Used to be a domestic private bank, transferred to SDIF in 2002 and then acquired by Türkiye Halk Bankası A.Ş. in 2004
Banca di Roma S.P.A.	Deposit	Foreign branch		Şekerbank T.A.Ş.	Deposit	Domestic private	34 percent of shares sold to BTA Bank of Kazakhstan in 2006
Bank Mellat	Deposit	Foreign branch		Société Générale (SA)	Deposit	Foreign branch	
BankPozitif Kredi ve Kalkınma Bankası A.Ş.	Dev. & Inv.	Foreign subsidiary		Taib Yatırım Bank A.Ş.	Dev. & Inv.	Foreign subsidiary	
Birleşik Fon Bankası A.Ş.	Deposit	Domestic public	Created through merger of several banks following the crisis, under SDIF management	Tekfenbank A.Ş.	Deposit	Foreign subsidiary	Used to be a domestic private bank, sold to Eurobank EFG Holding (Luxembourg) S.A. in 2007
Çalık Yatırım Bankası A.Ş.	Dev. & Inv.	Domestic private	Changed name to Aktif Yatırım Bankası A.Ş. in 2008	Tekstil Bankası A.Ş.	Deposit	Domestic private	
Calyon Bank Türk A.Ş.	Dev. & Inv.	Foreign subsidiary		Toprakbank A.Ş.	Deposit	Domestic private	Dissolved in 2002
Citibank A.Ş.	Deposit	Foreign subsidiary	Transformed from branch to subsidiary in 2004	Türk Ekonomi Bankası A.Ş.	Deposit	Domestic private	42 percent of shares sold to BNP Paribas of France in 2005
Credit Lyonnais Turkey	Deposit	Foreign branch	Acquired by Calyon Bank Türk A.Ş. in 2004	Türk Eximbank	Dev. & Inv.	Domestic public	
Credit Suisse First Boston	Deposit	Foreign branch	Dissolved in 2003	Türkisch Bank A.Ş.	Deposit	Domestic private	
Denizbank A.Ş.	Deposit	Foreign subsidiary	Used to be a domestic private bank, sold to Dexia (Belgium-France partnership) in 2006	Türkiye Cumhuriyeti Ziraat Bankası A.Ş.	Deposit	Domestic public	
Deutsche Bank A.Ş.	Deposit	Foreign subsidiary	Used to be an investment bank, licensed to take deposits in 2004	Türkiye Garanti Bankası A.Ş.	Deposit	Domestic private	
Diler Yatırım Bankası A.Ş.	Dev. & Inv.	Domestic private		Türkiye Halk Bankası A.Ş.	Deposit	Domestic public	
Fiba Bank A.Ş.	Deposit	Domestic private	Acquired by Finans Bank A.Ş. in 2003	Türkiye İmar Bankası T.A.Ş.	Deposit	Domestic private	Dissolved in 2003
Finans Bank A.Ş.	Deposit	Foreign subsidiary	Used to be a domestic private bank, sold to National Bank of Greece S.A. in 2006	Türkiye İş Bankası A.Ş.	Deposit	Domestic private	
Fortis Bank A.Ş.	Deposit	Foreign subsidiary	Used to be a domestic private bank (Türk Dış Ticaret Bankası A.Ş.), sold to Fortis Bank NV-SA in 2005	Türkiye Kalkınma Bankası A.Ş.	Dev. & Inv.	Domestic public	
GSD Yatırım Bankası A.Ş.	Dev. & Inv.	Domestic private		Türkiye Sınai Kalkınma Bankası A.Ş.	Dev. & Inv.	Domestic private	
Habib Bank Limited	Deposit	Foreign branch		Türkiye Vakıflar Bankası T.A.O.	Deposit	Domestic public	
HSBC Bank A.Ş.	Deposit	Foreign subsidiary		Turkland Bank A.Ş.	Deposit	Foreign subsidiary	Used to be a domestic private bank (MNG Bank A.Ş.), sold to Arap Bank Plc and BankMed in 2007
İller Bankası	Dev. & Inv.	Domestic public		WestLB AG	Deposit	Foreign branch	
İMKB Takas ve Saklama Bankası A.Ş.	Dev. & Inv.	Domestic private	Engaged in specialized banking services for capital markets	Yapı ve Kredi Bankası A.Ş.	Deposit	Domestic private	
ING Bank N.V.	Deposit	Foreign branch	Dissolved in 2003				

Source: Authors' gathering of information based on records from the Banks Association of Turkey.

Table 3. Summary Statistics

	Obs	Mean	Std. Dev.
Credit Growth			
All Banks	934	14.15	115.83
Foreign	313	24.30	182.99
Branch	129	34.26	268.50
Private Domestic	467	11.13	65.17
Domestic Currency Credit Growth			
All Banks	933	6.74	536.58
Foreign	312	-1.35	925.58
Branch	129	-49.23	1432.25
Private Domestic	467	13.18	62.13
Foreign Currency Credit Growth			
All Banks	842	37.69	395.54
Foreign	289	72.24	595.54
Branch	119	98.28	853.29
Private Domestic	411	24.81	264.31
Short-Term Credit Growth			
All Banks	677	26.99	259.32
Foreign	206	54.25	448.47
Branch	95	86.91	651.58
Private Domestic	359	18.59	104.49
Medium-and-Long-Term Credit Growth			
All Banks	574	41.01	410.27
Foreign	159	103.59	768.83
Branch	74	185.58	1117.70
Private Domestic	303	20.62	80.31
Major Balance Sheet Items			
Total Assets (millions of USD)	1060	6,932	13,600
In percent of total assets:			
Loans ¹	1019	36.24	23.33
Cash and Balances with the Central Bank	1060	2.72	3.55
Money Market Securities	681	10.55	16.40
Balances with Banks and Other Financial Institutions	1060	13.28	16.45
Financial Assets (Marked-to-Market)	932	12.20	18.80
Financial Assets Available for Sale	820	12.37	12.67
Investments Held to Maturity	561	13.39	15.62
Liquidity (1) ²	700	34.34	20.50
Liquidity (2) ³	681	12.91	16.61

1. Used to construct the retail-banking focus variable, that is, relative importance of retail banking activities (loans) as opposed to money market trades in the bank's business model.

2. As defined by the Bankers Association of Turkey. Includes cash and balances with the central bank, money market securities, balances with banks and other financial institutions, and financial assets available for sale.

3. Alternative measure of liquidity. Includes only cash and balances with the central bank, money market securities, and balances with banks and other financial institutions. Financial assets that may be subject to fire sales are excluded.

Table 4. Baseline Results

		All banks				Commercial banks			
		Monetary Policy		Fiscal Policy		Monetary Policy		Fiscal Policy	
		Univariate	Bivariate	Univariate	Bivariate	Univariate	Bivariate	Univariate	Bivariate
		I	II	III	IV	V	VI	VII	VIII
Panel A. Results with Liquidity (1)									
MP Indicator: Inflation rate, FP Indicator: Gross debt-to-GDP ratio									
All banks	I	0.00 (0.01)	0.02 (0.02)	0.06 (0.10)	0.05 (0.10)	-0.02 (0.01)	0.00 (0.02)	0.05 (0.11)	0.05 (0.11)
Small banks	II	0.00 (0.02)	0.03 (0.02)	0.08 (0.11)	0.08 (0.11)	-0.01 (0.02)	0.01 (0.02)	0.13 (0.13)	0.12 (0.13)
MP Indicator: Discount rate, FP Indicator: Primary surplus									
All banks	III	-1.22 (2.11)	-1.18 (2.12)	3.81 (3.81)	3.39 (3.76)	-0.46 (2.35)	-0.85 (2.29)	6.16 (5.62)	5.32 (5.54)
Small banks	IV	1.70 (2.72)	1.78 (2.70)	3.61 (4.04)	3.22 (3.94)	2.08 (2.63)	1.87 (2.49)	6.74 (6.18)	6.04 (5.98)
MP Indicator: Interbank money market rate, FP Indicator: Domestic debt-to-GDP ratio									
All banks	V	-0.54 (0.66)	-0.75 (0.74)	0.07 (0.08)	0.10 (0.10)	0.62 (0.56)	0.45 (0.63)	-0.06 (0.12)	-0.01 (0.15)
Small banks	VI	0.02 (0.84)	-0.23 (0.93)	0.08 (0.09)	0.11 (0.10)	0.78 (0.71)	0.56 (0.78)	-0.09 (0.13)	-0.02 (0.16)
Panel B. Results with Liquidity (2)									
MP Indicator: Inflation rate, FP Indicator: Gross debt-to-GDP ratio									
All banks	VII	-0.02 (0.03)	-0.08 ** (0.04)	0.03 (0.08)	0.02 (0.06)	0.00 (0.05)	-0.10 * (0.06)	-0.07 (0.14)	-0.09 (0.13)
Small banks	VIII	-0.02 (0.03)	-0.09 ** (0.04)	0.07 (0.11)	0.04 (0.09)	0.00 (0.04)	-0.10 ** (0.05)	-0.24 * (0.17)	-0.24 ** (0.14)
MP Indicator: Discount rate, FP Indicator: Primary surplus									
All banks	IX	-1.69 (2.40)	-1.96 (2.41)	3.21 * (2.18)	3.55 * (2.17)	-2.80 (2.49)	-2.92 (2.47)	3.65 (3.32)	4.01 (3.35)
Small banks	X	-1.84 (2.45)	-2.15 (2.48)	4.40 ** (2.23)	4.77 ** (2.21)	-3.43 (2.75)	-3.51 (2.73)	4.64 * (3.39)	4.89 * (3.41)
MP Indicator: Interbank money market rate, FP Indicator: Domestic debt-to-GDP ratio									
All banks	XI	3.43 ** (1.64)	4.59 *** (1.73)	0.02 (0.03)	0.06 * (0.04)	-2.14 (1.86)	-0.83 (1.97)	0.06 (0.05)	0.10 * (0.06)
Small banks	XII	3.84 ** (1.81)	5.03 *** (1.91)	0.01 (0.04)	0.05 (0.05)	-2.05 * (1.53)	-0.11 (1.43)	0.03 (0.07)	0.11 (0.08)

Notes: The table shows the sum of the coefficients on monetary and fiscal policy indicators from the second-step regression described in the Methodology section. The monetary policy (MP) indicator is the annual inflation rate in rows I, II, VII, and VIII; the discount rate in rows III, IV, IX, and X; and the interbank money market rate in rows V, VI, XI, and XII. The fiscal policy (FP) indicator is the gross debt-to-GDP ratio in rows II, II, VII, and VIII; primary surplus in rows III, IV, IX, and X; and the domestic debt-to-GDP ratio in rows V, VI, XI, and XII. The liquidity variable at the bank-level first-step regressions is Liquidity (1) in rows I through VI while it is Liquidity (2) in rows VII through XII. The retail-banking focus variable in all rows is the proportion of a bank's loan-to-asset ratio to the average loan-to-asset ratio of the banking sector for a given year. Small banks are defined as those in the lower 95th percentile of the distribution in terms of total assets in a given year. The univariate specification includes only the policy indicators in the second-step regression while the bivariate specification also includes the real GDP growth rate to take into account the interactions between the policy responses and the business cycle. Standard errors are in parentheses. ***, **, * represent statistical significance at the 1, 5, 10 percent level, respectively.

Table 5. Results with respect to Currency Denomination

		All banks				Commercial banks			
		Monetary Policy		Fiscal Policy		Monetary Policy		Fiscal Policy	
		Univariate	Bivariate	Univariate	Bivariate	Univariate	Bivariate	Univariate	Bivariate
		I	II	III	IV	V	VI	VII	VIII
Panel A. Loans denominated in domestic currency									
MP Indicator: Inflation rate, FP Indicator: Gross debt-to-GDP ratio									
All banks	I	-0.03 *	-0.09 ***	-0.07	-0.08	-0.04	-0.20 **	-0.39 *	-0.60 **
		(0.02)	(0.02)	(0.09)	(0.10)	(0.08)	(0.10)	(0.24)	(0.25)
Small banks	II	-0.02	-0.09 ***	-0.07	-0.08	-0.04	-0.23 **	-0.47 **	-0.64 ***
		(0.02)	(0.02)	(0.08)	(0.09)	(0.07)	(0.09)	(0.23)	(0.24)
MP Indicator: Discount rate, FP Indicator: Primary surplus									
All banks	III	4.40 *	4.31 *	-6.85 **	-6.78 **	-12.83	-11.41	-6.81	-6.75
		(3.19)	(3.14)	(2.75)	(2.75)	(11.50)	(11.40)	(8.21)	(7.72)
Small banks	IV	5.64 **	5.57 **	-2.63	-2.56	-10.29	-9.08	-5.80	-5.58
		(3.09)	(3.08)	(2.41)	(2.40)	(11.00)	(10.87)	(7.99)	(7.80)
MP Indicator: Interbank money market rate, FP Indicator: Domestic debt-to-GDP ratio									
All banks	V	2.48 **	3.37 ***	0.06 *	0.03	-2.84	-0.96	0.00	-0.13
		(0.98)	(1.02)	(0.04)	(0.05)	(3.10)	(3.43)	(0.11)	(0.12)
Small banks	VI	2.63 ***	3.65 ***	0.03	0.01	-2.83	-0.06	0.04	-0.03
		1.03	(1.04)	(0.03)	(0.04)	(3.16)	(3.40)	(0.11)	(0.13)
Panel B. Loans denominated in foreign currency									
MP Indicator: Inflation rate, FP Indicator: Gross debt-to-GDP ratio									
All banks	VII	0.03 **	0.00	0.09	0.10	0.04	-0.01	0.15	0.13
		(0.02)	(0.02)	(0.11)	(0.10)	(0.03)	(0.05)	(0.16)	(0.16)
Small banks	VIII	0.03 *	0.00	-0.01	0.01	0.04	-0.01	0.13	0.12
		(0.02)	(0.02)	(0.13)	(0.12)	(0.03)	(0.05)	-0.14	(0.13)
MP Indicator: Discount rate, FP Indicator: Primary surplus									
All banks	IX	2.25	2.65	1.10	0.88	3.60	4.19	1.28	1.46
		(3.37)	(2.83)	(3.05)	(3.04)	(5.90)	(5.30)	(4.13)	(4.15)
Small banks	X	4.14	4.63 *	-0.02	-0.51	3.62	4.11	1.52	1.61
		(3.59)	(3.00)	(3.66)	(3.60)	(5.99)	(5.15)	-3.85	(3.83)
MP Indicator: Interbank money market rate, FP Indicator: Domestic debt-to-GDP ratio									
All banks	XI	1.25	2.88 ***	0.03	0.09	-1.38	0.45	0.14 *	0.15
		(1.11)	(0.98)	(0.07)	(0.09)	(1.68)	(1.64)	(0.11)	(0.13)
Small banks	XII	1.64 *	3.60 ***	0.05	0.15 *	-1.64	0.49	0.08	0.12
		(1.22)	(1.03)	(0.09)	(0.10)	(1.70)	(1.60)	(0.10)	(0.12)

Notes: The table shows the sum of the coefficients on monetary and fiscal policy indicators from the second-step regression described in the Methodology section. The monetary policy (MP) indicator is the annual inflation rate in rows I, II, VII, and VIII; the discount rate in rows III, IV, IX, and X; and the interbank money market rate in rows V, VI, XI, and XII. The fiscal policy (FP) indicator is the gross debt-to-GDP ratio in rows II, VII, and VIII; primary surplus in rows III, IV, IX, and X; and the domestic debt-to-GDP ratio in rows V, VI, XI, and XII. In all rows, the liquidity variable at the bank-level first-step regressions is Liquidity (2) and the retail-banking focus variable is the proportion of a bank's loan-to-asset ratio to the average loan-to-asset ratio of the banking sector for a given year. Small banks are defined as those in the lower 95th percentile of the distribution in terms of total assets in a given year. The univariate specification includes only the policy indicators in the second-step regression while the bivariate specification also includes the real GDP growth rate to take into account the interactions between the policy responses and the business cycle. Standard errors are in parentheses. ***, **, * represent statistical significance at the 1, 5, 10 percent level, respectively.

Table 6. Results with respect to Maturity of Credit

		All banks				Commercial banks			
		Monetary Policy		Fiscal Policy		Monetary Policy		Fiscal Policy	
		Univariate	Bivariate	Univariate	Bivariate	Univariate	Bivariate	Univariate	Bivariate
		I	II	III	IV	V	VI	VII	VIII
Panel A. Short-term loans									
MP Indicator: Inflation rate, FP Indicator: Gross debt-to-GDP ratio									
All banks	I	0.01 (0.04)	-0.03 (0.05)	-0.16 (0.39)	-0.10 (0.40)	0.06 * (0.04)	0.04 (0.05)	0.63 (0.59)	0.82 * (0.60)
Small banks	II	0.00 (0.04)	-0.03 (0.05)	-0.20 (0.40)	-0.17 (0.41)	0.07 ** (0.03)	0.06 * (0.04)	0.36 (0.43)	0.26 (0.45)
MP Indicator: Discount rate, FP Indicator: Primary surplus									
All banks	III	5.36 (9.12)	14.18 (10.87)	18.94 ** (10.44)	16.06 (12.62)	13.03 * (9.15)	20.30 ** (10.24)	3.70 (12.96)	-5.01 (15.65)
Small banks	IV	5.01 (9.56)	13.12 (11.38)	20.67 ** (11.19)	20.45 * (13.82)	20.33 ** (8.56)	34.28 *** (9.13)	3.43 (10.16)	14.56 (11.67)
MP Indicator: Interbank money market rate, FP Indicator: Domestic debt-to-GDP ratio									
All banks	V	2.59 (8.94)	4.63 (9.88)	0.39 *** (0.13)	0.33 ** (0.14)	-5.06 (9.74)	2.08 (10.21)	0.42 *** (0.14)	0.40 *** (0.15)
Small banks	VI	-1.44 (9.23)	1.20 (10.17)	0.36 *** (0.14)	0.33 ** (0.14)	-1.50 (8.35)	10.82 * (8.10)	0.48 *** (0.12)	0.55 *** (0.11)
Panel B. Medium-to-long-term loans									
MP Indicator: Inflation rate, FP Indicator: Gross debt-to-GDP ratio									
All banks	VII	0.00 (0.06)	-0.15 *** (0.06)	-0.19 (0.42)	-0.20 (0.40)	0.04 (0.06)	-0.11 * (0.06)	-0.07 (0.40)	-0.07 (0.40)
Small banks	VIII	0.01 (0.06)	-0.16 *** (0.06)	-0.43 (0.56)	-0.42 (0.53)	0.03 (0.07)	-0.13 ** (0.06)	-0.39 (-0.59)	-0.34 (-0.58)
MP Indicator: Discount rate, FP Indicator: Primary surplus									
All banks	IX	3.88 (7.76)	-3.60 (8.82)	3.53 (24.50)	3.92 (25.01)	10.25 (10.03)	5.05 (11.68)	23.88 (27.49)	14.70 (26.71)
Small banks	X	7.24 (8.57)	-4.06 (9.10)	3.26 (28.85)	4.33 (29.37)	6.01 (10.29)	-1.01 (11.65)	27.61 (-31.91)	18.72 (-32.14)
MP Indicator: Interbank money market rate, FP Indicator: Domestic debt-to-GDP ratio									
All banks	XI	28.81 ** (12.32)	19.97 * (12.57)	-0.16 (0.17)	-0.16 (0.18)	31.66 ** (13.86)	24.96 * (15.05)	-0.02 (0.16)	-0.06 (0.16)
Small banks	XII	33.10 ** (13.66)	22.60 * (13.55)	-0.21 (0.20)	-0.18 (0.21)	30.58 ** (14.34)	23.56 * (15.39)	-0.15 (0.19)	-0.12 (0.19)

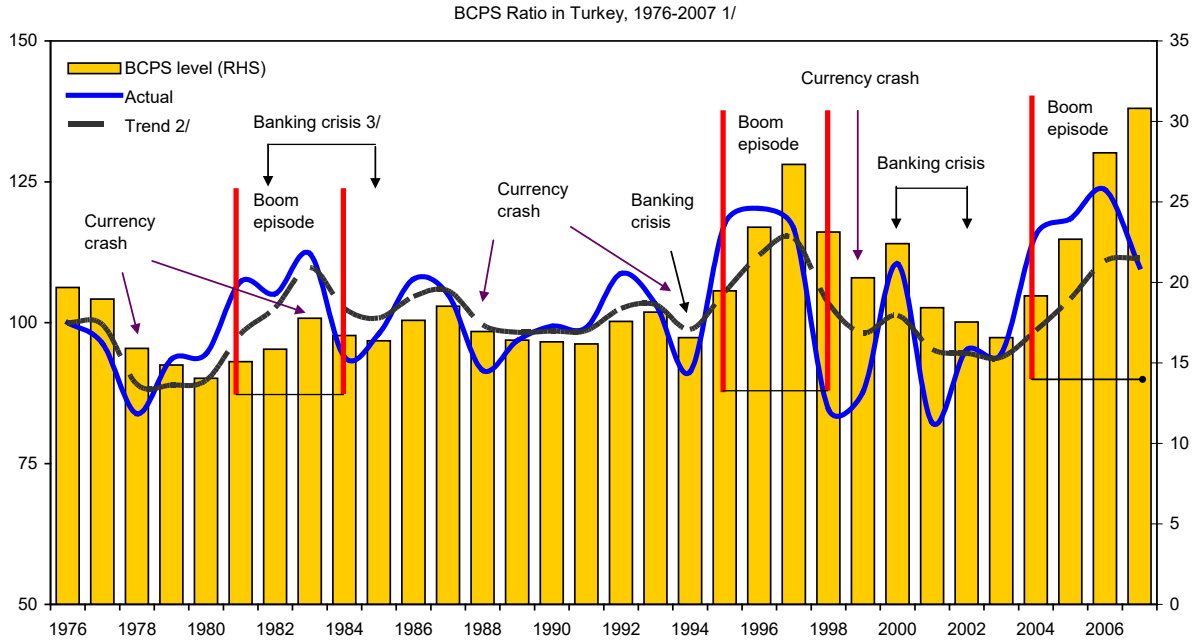
Notes: The table shows the sum of the coefficients on monetary and fiscal policy indicators from the second-step regression described in the Methodology section. The monetary policy (MP) indicator is the annual inflation rate in rows I, II, VII, and VIII; the discount rate in rows III, IV, IX, and X; and the interbank money market rate in rows V, VI, XI, and XII. The fiscal policy (FP) indicator is the gross debt-to-GDP ratio in rows II, III, VII, and VIII; primary surplus in rows III, IV, IX, and X; and the domestic debt-to-GDP ratio in rows V, VI, XI, and XII. In all rows, the liquidity variable at the bank-level first-step regressions is Liquidity (2) and the retail-banking focus variable is the proportion of a bank's loan-to-asset ratio to the average loan-to-asset ratio of the banking sector for a given year. Small banks are defined as those in the lower 95th percentile of the distribution in terms of total assets in a given year. Short-term loans are those with maturity less than one year. The univariate specification includes only the policy indicators in the second-step regression while the bivariate specification also includes the real GDP growth rate to take into account the interactions between the policy responses and the business cycle. Standard errors are in parentheses. ***, **, * represent statistical significance at the 1, 5, 10 percent level, respectively.

Table 7. Results for Foreign Banks

	Foreign banks			
	Monetary Policy		Fiscal Policy	
	Univariate	Bivariate	Univariate	Bivariate
	I	II	III	IV
<u>Panel A. Total loans</u>				
I	-0.08 (0.14)	-0.18 (0.20)	-0.33 (0.66)	-0.31 (0.66)
II	-0.01 (0.59)	-0.07 (0.60)	0.64 (0.51)	0.66 * (0.48)
III	0.13 ** (0.07)	0.13 * (0.08)	0.00 (0.03)	0.04 (0.04)
<u>Panel B. Loans denominated in domestic currency</u>				
IV	0.25 (0.27)	0.43 (0.38)	1.08 (0.89)	1.35 * (0.84)
V	-2.79 (4.65)	-2.57 (4.62)	-18.52 (22.94)	-18.67 (18.09)
VI	-0.75 (1.45)	-1.93 (1.53)	0.00 (0.37)	-0.61 * (0.40)
<u>Panel C. Loans denominated in foreign currency</u>				
VII	-0.33 * (0.21)	-0.81 *** (0.28)	-0.58 (0.45)	-0.63 * (0.42)
VIII	-1.39 (3.86)	-1.06 (3.86)	-12.50 (10.12)	-13.96 * (9.44)
IX	0.37 (1.24)	1.17 (1.35)	0.17 (0.22)	-0.08 (0.25)

Notes: The table shows the sum of the coefficients on monetary and fiscal policy indicators from the second-step regression described in the Methodology section. The monetary policy (MP) indicator is the annual inflation rate in rows I, IV, and VII; the discount rate in rows II, V, and VIII; and the interbank money market rate in rows III, VI, and IX. The fiscal policy (FP) indicator is the gross domestic debt-to-GDP ratio in rows I, IV, and VII; and the primary surplus in rows II, V, and VIII; and the domestic debt-to-GDP ratio in rows III, VI, and IX. In all rows, the liquidity variable at the bank-level first-step regressions is Liquidity (2) and the retail-banking focus variable is the proportion of a bank's loan-to-asset ratio to the average loan-to-asset ratio of the banking sector for a given year. Small banks are defined as those in the lower 95th percentile of the distribution in terms of total assets in a given year. The univariate specification includes only the policy indicators in the second-step regression while the bivariate specification also includes the real GDP growth rate to take into account the interactions between the policy responses and the business cycle. Standard errors are in parentheses. ***, **, * represent statistical significance at the 1, 5, 10 percent level, respectively.

Figure 1. Bank Credit to the Private Sector and Crises



Source: IMF International Financial Statistics; authors' calculations.

1/ Bank credit to the private sector (BCPS) ratio is calculated as claims on private sector divided by GDP and is expressed as an index with base year 1976.

2/ Estimated using a rolling, backward-looking, country-specific cubic trend.

3/ Banking distress episodes as identified using the methodology in Caprio and Klingebiel (1999).

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² This is in terms of the old GDP series; corresponds to about 5 percent of the revised GDP.

³ For more on relationship banking, see Freixas (2005) and references therein.

⁴ We limit the time period to these dates to exclude the periods of distress while maintaining comparability of reported data. For instance, the restructuring and review of reporting requirements and the accounting standards took a couple of years to complete following the 2000-01 crisis. In addition, effects of the global financial crisis transmitted to the Turkish financial sector as early as the second quarter of 2008 with market value of financial sector stocks plummeting from USD 115 billion at the end of 2007 to USD 60 billion in June 2008.

⁵ Değirmen (2007) shows public sector borrowing reduced lending by state-owned banks in Turkey during the 1990s.

⁶ General government expenditures account for roughly a third of GDP. Public debt stock came down from 74 percent at end-2002 to 39 percent at end-2007.

⁷ The crisis erupted in November 2000 when Demirbank liquidated a large amount of government securities leading to a collapse in the value of government securities, triggering capital outflows and a fall in international reserves. The crisis revealed maturity mismatches in the banking sector and its exposure to interest and exchange rate risk. Continued deterioration in economic conditions and weak policy responses ignited further capital outflows. Overnight interest rates spiked and liquidity injections destabilized the crawling peg, which was later abandoned. Fiscal cost of the crisis reached 32 percent of GDP while output loss is was around 16 percent of GDP. See Akyürek (2006) for more on the crisis.

⁸ Turkey had several programs with the IMF prior to 2001; the 1999 one also included a stabilization program and reform of the banking sector among its priorities [Çapoğlu (2001)].

⁹ In our dataset, there are 55 banks. 9 banks that make up the difference had been subject to reorganizational changes. We still include these in the empirical analysis to minimize survival bias. Also the sample excludes participation banks, e.g., Islamic banks.

¹⁰ Use of unconsolidated data may underestimate the impact on foreign-currency-denominated loans. However, our results do not change when consolidated data are used.

¹¹ See the appendix of the working paper version of this article for further details on data issues: available at <http://www.imf.org/external/pubs/cat/longres.cfm?sk=24282.0>.

¹² There are alternative measures to proxy for retail-banking focus. For instance, using income statements, one could look at the earnings from interest and earnings from fees & commissions and build a measure based on how large these are relative to other income sources. Accounting rules and the level of detail in reporting, however, might create a wedge between these variables and the concept we are interested in since, for instance, commissions

generally pertain to both loans and financial market transactions. In other words, such a measure would be subject to severe measurement error. Another potential measure could come directly from the bank's holdings of various securities. Nevertheless, public debt securities constitute the lion's share in the financial securities portfolio of Turkish banks and the fact that these are also considered to be a measure of liquidity might generate problems in the econometric analysis. Hence, we pass such alternative measures in favor of the rank variable based on loans to the private sector.

¹³ Note that the loan-to-asset ratio may be higher in small banks, not necessarily because they have a comparative advantage in retail banking activities but reflecting the fact that large banks are the dominant players in the trading market place. In the regression analysis, we control for size to take such biases in the data into account.

¹⁴ Note that this measurement issue is not specific to the case we study and the difficulty of measuring macroeconomic policies has long been recognized in the literature (Kashyap and Stein, 2000).

¹⁵ As explained in the Methodology section, a decline in the monetary measure M and fiscal measure F indicate, respectively, monetary and fiscal tightening. In order to have uniformity in the sign of the coefficient estimates, inverse of discount rate, interbank money market lending rate and primary surplus ratio are used in the second-step estimations.

¹⁶ Even though the rankings for bank size are performed for each quarter in the sample, in Turkey, three banks are dominantly larger than the rest for every given time period. These are Türkiye Cumhuriyeti Ziraat Bankası, a state-owned bank, Akbank T.A.Ş. and Türkiye İŞ Bankası A.Ş., where the latter two are privately owned domestic banks