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An Analysis of the Macroeconomic Conditions Required for SME Lending: Evidence from Turkey and Other Emerging Market Countries

Summary: Providing small and medium enterprises (SMEs) with access to external finance has been a major concern for many governments and international organizations for three decades. In recent years the experiences of emerging market countries suggest that a paradigm shift is taking place in SME finance. Particularly in fast-growing emerging market countries such as Turkey, banks are increasingly targeting SMEs as a new line of banking business. This research analyzes how macroeconomic factors have contributed to increased commercial bank lending to SMEs in six emerging market countries: Turkey, Argentina, Brazil, Mexico, Chile, and Poland. Based on time series and panel data analysis, we find that a high GDP growth rate and increased competition in the banking sector have contributed to increased banking sector credit to SMEs. The findings also reveal that curbing the high inflation rate and reducing government domestic borrowing have significantly encouraged bank lending to the SME segment.

Key words: SME lending, Macroeconomics, Banking sector, Emerging markets, Access to credit.

JEL: G21, G28, O12.

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It has often been argued that the characteristics of SMEs are incompatible with conventional banks' lending practices, and that banks, therefore, choose to limit their credit exposure to this sector. In other words, the lack of transparency in the financial position of SMEs and the inadequate or insufficient collateral owned by these businesses has made SMEs unattractive for banks (Allen N. Berger and Gregory F. Udell 2006). On the other hand, recent country surveys conducted by the World Bank Group have consistently shown that commercial banks, in particular in emerging market countries, have been increasingly focusing on SMEs (Augusto de la Torre, María S. Martínez Pería, and Sergio L. Schmukler 2010; International Finance Corporation (IFC) 2010).

There is no evidence to suggest that SMEs are now more transparent or more credit worthy than they were before. The common characteristics of SMEs that made them unattractive for banks 40 years ago still exist. Therefore, the issue of what has attracted banks to SMEs in emerging market countries during the past decade is a critical research question. The main objective of this paper is to investigate whether the changing macroeconomic environment has contributed to the transformation of

banks' approach toward SME lending in Turkey, and to compare the Turkish experience with five other emerging market countries, namely Argentina, Brazil, Mexico, Chile, and Poland.

The paper is organized as follows. Section 1 reviews the literature and develops the conceptual framework for the analysis. Section 2 summarizes the economic and financial environment of Turkey between 1980 and 2012, and describes how the relationship between commercial banks and SMEs changed in Turkey during this period. Section 3 reviews the experiences of other emerging market countries, while Section 4 presents the regression models and empirical findings for Turkey and other emerging market countries. Section 5 presents our concluding remarks and discusses the implications of our findings.

1. Literature Review and Conceptual Framework

The fact that in most countries, SMEs make up the biggest share of total businesses yet receive the smallest share of credit has stimulated a great deal of research around the world. Earlier studies mostly focused on SME-specific (opaqueness of SMEs) or bank-specific (banks' lending capacity) factors to explain banks' credit-rationing behavior toward SMEs. In order to make correct lending decisions, banks need to have up-to-date, reliable financial information to assess the credit risk of their potential borrowers. However, the opaqueness of SMEs, i.e. information asymmetries between SMEs and banks, makes it difficult and costly for banks to deal with SME borrowers. Hence, banks often choose to ration credit to this sector, or ask for more collateral than they would normally ask for from large enterprises (Berger, Leora F. Klapper, and Udell 2001; Thorsten Beck, Asli Demirgüç-Kunt, and Vojislav Maksimovic 2005; Berger and Udell 2006).

The relationship lending theory, which emerged in the early 1990s, argues that the information asymmetries between banks and SMEs can be overcome by banks through developing close relationships with SMEs. Based on the "know your customer" principle, this theory suggests that small banks are better equipped to serve SME clients because such banks have a smaller number of clients to serve, and hence, they can get to know their customers better. In large banks, however, the client-bank relationship is mostly impersonal and distant because bank personnel often have no time to develop relationships with their SME clients. Hence, according to this theory, small banks have an advantage over large banks when dealing with the information asymmetries. This implies that small banks are able to make a bigger share of their loans to SMEs than are the large banks. This approach gained support in the 1990s through research by Mitchell A. Petersen and Raghuram G. Rajan (1994), William R. Keeton (1995), and Berger et al. (1998). According to the findings of these studies, large banks allocated a smaller percentage of their assets to SMEs than the small banks did. Furthermore, bigger banks through bank mergers and acquisitions were found in some studies to have reduced their credit supply to small businesses (Berger et al. 1998).

More recently, however, these views have been challenged by World Bank (2007a, b), Beck, Demirgüç-Kunt, and Maksimovic (2008), De la Torre, Martínez Pería, and Schmukler (2010), IFC (2010), Roberto Rocha et al. (2010), Gunhild Berg

and Michael Fuchs (2013), and Hatice Jenkins (2014). Contrary to earlier research, these studies found that, primarily in emerging market countries, not only the small niche banks but also large domestic and foreign banks are increasingly lending to SMEs and targeting this sector when marketing their financial products. In line with these observations, Jenkins (2014) provided further evidence that in Turkey the large banks, on average, allocate 26% of their total loan portfolio to SMEs, whereas the smaller banks allocate only 17%. It is clear that these findings, which come recently from emerging market countries, cannot be explained by the relationship lending theory of the 1990s. This implies that there must be factors other than bank size that affect SME lending.

The recent World Bank studies confirm our intuition that external factors such as the macroeconomic environment, banking sector competition, credit bureaus and countries' legal systems play a more significant role in encouraging or discouraging bank SME lending than was previously believed. For example, based on the survey results of 91 banks from 45 countries, Beck, Demirgüç-Kunt, and Maksimovic (2008, p. 3) stated that "banks perceive the SME segment to be highly profitable, but perceive macroeconomic instability in developing countries and competition in developed countries as the main obstacles".

These recent findings bring our attention back to the theoretical discussions on a favorable macroeconomic environment that is conducive for SME finance. Early studies on financial liberalization and financial repression theories suggest that repressive interest rate policies are harmful for business finance (Ronald I. McKinnon 1973; Edward S. Shaw 1973). According to these studies, imposing interest rate ceilings below market rates keeps interest rates artificially low and discourages savers from saving in financial institutions. This causes a shortage of funds in which banks are forced to ration credit for some businesses. The experiences showed that credit rationing affects mostly young small businesses with no credit record, or a lack of sufficient collateral. According to McKinnon (1973) and Shaw (1973), liberalization of interest rates can increase domestic savings and hence increase the availability of loanable funds for all businesses. Furthermore, the financial liberalization theory suggests that foreign banks' entry into the domestic market can increase competition in the domestic banking sector, forcing banks to look for other markets, such as the SME sector.

The early research on financial liberalization experiences was surveyed by Rudiger Dornbusch and Sebastian Edwards (1991) and later by James Hanson (2005), Rajmund Mirdala (2006), and many others. These studies showed that financial reforms and liberalization policies produced many positive results in the 1990s. However, the results fell short of expectations. During this period, as a result of economic instability and severe financial crises in many countries, the effectiveness of financial liberalization policies was reduced. Moreover, the suitability of financial liberalization policies for developing countries was often questioned. Although bank deposits increased rapidly in the 1990s in most developing countries, SMEs' access to credit remained low owing to the crowding-out effect of governments (Hanson 2005; World Bank 2005).

The full benefits of the financial liberalization policies began to emerge in the 2000s in emerging market countries where economic stability was largely achieved

and institutional reforms were mostly realized. In these countries, high liquidity, reduced government borrowing, and increased competition for corporate lending began to push banks out of their comfort zone toward the more challenging and profitable SME sector. In this respect, the recent World Bank and IFC cross-country studies play a significant role in advancing our understanding of SME lending in emerging market countries (World Bank 2007a, b; Beck, Demirgüç-Kunt, and Maksimovic 2008; De la Torre, Martínez Pería, and Schmukler 2010; IFC 2010; Michael Fuchs et al. 2011). Within this framework, we investigate quantitatively whether economic growth and stability, the government budget deficit, and banking sector competition significantly affected bank lending to SMEs in the Turkish economy and five other emerging market countries between 2007 and 2013.

2. The Economic and Financial Environment in Turkey between 1980 and 2013

2.1 Summary of Developments in the Turkish Economy

In the 1960s and 1970s, Turkey followed an import substitution industrialization strategy in which protectionist economic policies were applied. Starting from 1980, the country began to liberalize its economy and to adopt open, export-oriented economic policies. These policies were supported by World Bank structural adjustment and stabilization programs for Turkey that aimed to promote economic stability and growth. However, most of these reforms were implemented in an inflationary and unstable economic environment, and the country went through several financial and economic crises between 1980 and 2001. High inflation, sharp exchange rate depreciation, and macroeconomic instability became regular phenomena in Turkey throughout the 1980s and 1990s. During this period, economic growth fluctuated between -5.5% and over 9% and the inflation rate fluctuated between 25% and 127%.

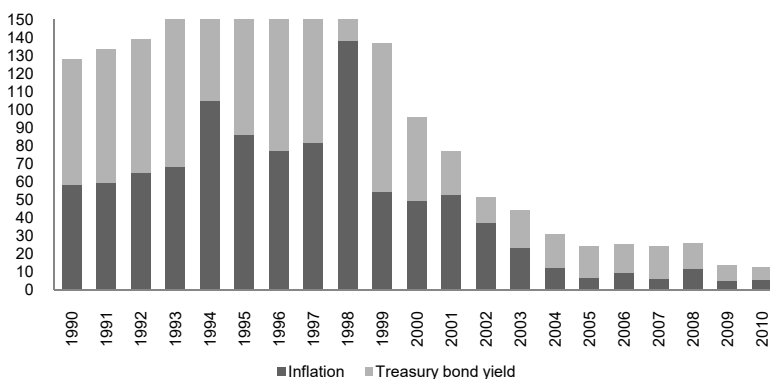
In 2001, Turkey experienced a severe financial crisis in which 18 domestic banks had to be liquidated. Before the crisis, Turkey already had a fragile banking system in which banks relied heavily on financing the government budget deficit (Fatih Özatay and Güven Sak 2003). The banking sector acted as the government agent, financing mainly government debt instruments. Interest rates on treasury bills and bonds were, on average, 30% above the inflation rate during the 1990s (Figure 1). This high yield encouraged banks to borrow from abroad and invest in treasury securities. As a result, both the capital and money markets became heavily dependent on short-term capital inflows. In 2000, more than half of the interest earnings of private banks consisted of government securities, whereas almost two-third of their liabilities were denominated in foreign currency (Yılmaz Akyüz and Korkut Boratav 2003). Consequently, the banking sector was exposed to foreign exchange rate risk and became vulnerable to sudden capital reversals.

In 2000, government borrowing went up to 40% of GDP and the interbank rate jumped to 873% as the interbank credit market dried up (Koen Brinke 2013). In February 2001, the Turkish lira depreciated by about one-third of its value against the dollar. Private banks made big losses as a result of their unhedged foreign currency positions. The Savings and Deposit Insurance Fund (SDIF) had to rescue 18 banks

and the total banking sector asset decreased by 12% in real value during the crisis. The Istanbul stock exchange fell by 14% and the economy shrunk by 5.7%.

The crisis shook the Turkish banking system, and its fragility was fully recognized by policymakers. In 2000, Turkey established an independent banking authority called the Banking Regulation and Supervision Agency (BRSA). The main objectives of BRSA were to ensure the stability of and confidence in financial markets, provide effective operation of the loan system, and safeguard the rights and interests of depositors (BRSA 2010). Immediately after the crisis, BRSA implemented policy initiatives and a restructuring program in order to strength the regulatory and supervisory framework in Turkey. Various amendments to banking law were made in line with international best practice and EU directives.

Along with the reforms in the banking sector, the new government elected in 2002 implemented initiatives to improve the business environment. These initiatives included large tax cuts, reduced bureaucracy for foreign companies, and privatization of state enterprises. State banks and banks under SDIF control were privatized or merged with other banks (Brinke 2013). These policy changes helped to regain investors' trust, both at home and abroad, resulting in significant capital inflows. The economy recovered from the crisis and started to grow steadily. From 2002 to 2007 Turkey maintained an average growth rate of about 7%. In 2004, both the inflation and unemployment rates came down to single digits. Finally, macroeconomic stability was achieved, along with a stable political regime, which helped the country's private sector to develop.



Source: Authors' calculations based on Organization for Economic Co-operation and Development (OECD 2014)¹ and World Bank (2014)² data.

Figure 1 Treasury Bill Rate and Inflation Rate in Turkey

¹ **Organisation for Economic Co-operation and Development (OECD)**, 2014. Main Economic Indicators for Turkey. <https://data.oecd.org/turkey.htm> (accessed December 05, 2014).

² **World Bank**, 2014. World Development Indicators. <http://data.worldbank.org/indicator> (accessed December 05, 2014).

2.2 Developments in Commercial Bank Lending to SMEs in Turkey

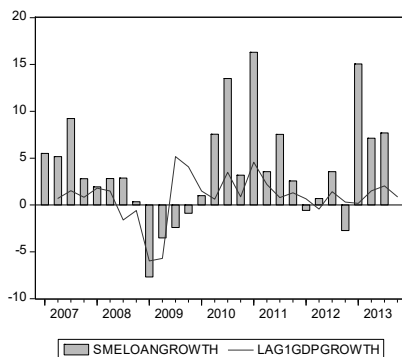
According to official statistics, there are about 3.2 million businesses in Turkey, and 99.9% of these are SMEs (Turkish Statistical Institute 2009)³. According to the official definition of SMEs in Turkey, businesses with fewer than 10 employees or annual sales of less than 1 million Turkish lira (TL) are classified as microenterprises; businesses with 10-49 employees or annual sales of 1-5 million TL are classified as small businesses; and businesses with 50-249 employees or annual sales of 5-25 million TL are classified as medium-sized businesses (Small and Medium Scale Enterprises Development Organization (KOSGEB) 2011). In Turkey, the term “SMEs” includes not only small and medium-sized enterprises but also microenterprises. As many as 96% of all SMEs in Turkey are microenterprises, while 3.5% are small and only 0.50% are medium-sized (KOSGEB 2011). This indicates that the majority of businesses in Turkey are very small enterprises. These businesses play a very significant role in the economy, accounting for 78% of employment, 55% of GDP, and 59% of exports (KOSGEB 2011). Nevertheless, SMEs’ share of commercial bank credit remained very low until very recently. It is estimated by the State Planning Organization (SPO) of Turkey that SMEs received only 5% of the total bank credit in the 1990s.

As discussed above, SMEs in Turkey operated in an unstable macroeconomic environment shaped by high inflation, frequent financial crises, and economic recessions. These unfavorable conditions negatively affected SMEs and discouraged banks from extending credit to this sector. In order to help offset these poor economic conditions, numerous government programs were introduced in 2004 and 2005 to support SMEs’ development and growth. These programs were executed by both governmental and non-governmental organizations, such as the KOSGEB, the Credit Guarantee Fund (KGF), and the Confederation of Turkish Small Businesses and Artisans (TESK). As a result of Turkey becoming a candidate for EU membership, a number of EU projects have also been created to support SMEs in the country (OECD 2004).

In recent years, the most important development in SME lending in Turkey has been the increased interest on the part of commercial banks in providing financial services to SMEs. After the inflation rate fell from around 75% per annum in 2001 to 7% in 2005, banks started to establish SME banking departments to target SME clients for lending and to provide them with other financial services (Jenkins 2014). Bank lending to SMEs moved in line with GDP growth: it declined during the global financial crisis between 2008 and 2010, and recovered after 2010 (Figure 2).

The World Bank Enterprise Surveys (WBES) data on Turkey also show that bank financing of SMEs increased significantly between 2002 and 2010 (Figure 3). The working capital financed by private commercial banks increased from 2% in 2002 to 15.4% in 2008. Similarly, financing of fixed assets increased from less than 4% in 2002 to over 32% in 2010 (Figure 3).

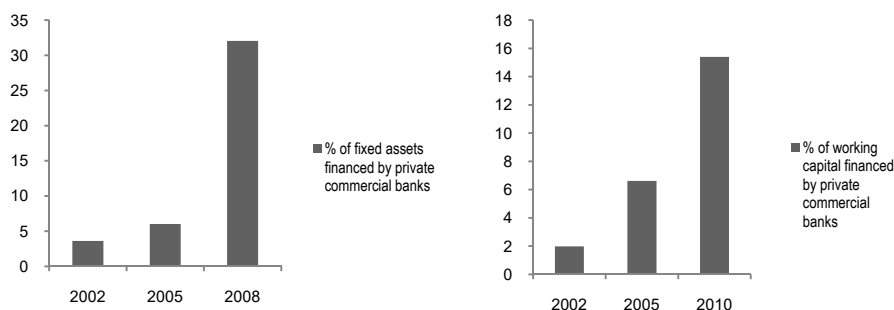
³ **Turkish Statistical Institute.** 2009. Annual Business Statistics (in Turkish). <http://www.tuik.gov.tr/> (accessed December 05, 2014).



Note: Figure shows quarterly percentage growth rates in SME loans and GDP.

Source: Authors' calculations based on BRSA (2014)⁴ and OECD (2014) data.

Figure 2 SME Loan Growth and GDP Growth Rates in Turkey



Source: Authors' calculations based on World Bank (2002, 2005, 2010)⁵.

Figure 3 SME Financing by Private Commercial Banks in Turkey

During this period, Turkish banks also relaxed collateral requirements from the SME sector. According to the WBES 2008 data, the proportion of total SME loans that required collateral was only 67.7% in Turkey. This rate is much lower than both the regional and world averages of 89% and 88%, respectively. The average value of collateral required for SMEs loans (measured as the percentage of the loan amount) also declined from 105% in 2005 to 77% in 2008. Again, this rate is much lower than the upper middle income country average of 92% in 2008, and is the low-

⁴ **Banking Regulation and Supervision Agency.** 2014. Statistical Data. Interactive Monthly Bulletin. <http://www.bddk.org.tr/> (accessed December 05, 2014).

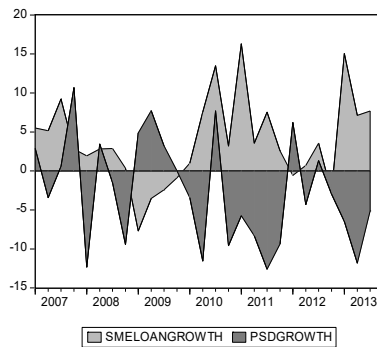
⁵ **World Bank.** 2002. World Bank Enterprise Surveys. Turkey, Business Environment and Enterprise Performance Survey. <https://www.enterprisesurveys.org/portal/index.aspx#/library?dataset=Enterprise%20Survey> (accessed April 09, 2014).

World Bank. 2005. World Bank Enterprise Surveys. Turkey, Enterprise Survey. <https://www.enterprisesurveys.org/portal/index.aspx#/library> (accessed April 09, 2014).

est value of collateral needed within the Eastern Europe and Central Asia region (World Bank 2010)⁶.

Another important factor that appears to be closely related to the recent SME lending growth in the Turkish market is the decrease in government borrowing. Prior to the mid-2000s, Turkish banks were highly concentrated in financing public sector borrowing and large corporations (Akyüz and Boratav 2003). When government borrowing started to decrease, banks' lending to SMEs began to increase. Figure 4 illustrates this negative relationship between SME lending and government borrowing.

Furthermore, a recent study by Hüseyin Şen and Ayşe Kaya (2014) indicated that in Turkey, government spending (except the capital expenditure) has a crowding-out effect on private investment.



Source: Authors' calculations based on BRSA (2014) and World Bank (2014) data.

Figure 4 Growth Rates of SME Lending and Public Sector Debt (PSD) in Turkey

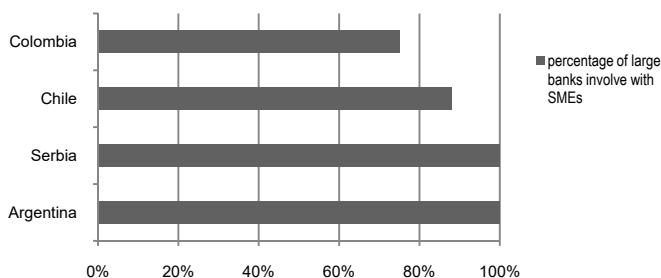
3. Evidence from Other Emerging Market Countries

Similar to Turkey, most Latin American countries underwent several financial and economic crises in the 1980s and 1990s as they started to liberalize their economies. Since 1970, Argentina and Brazil each experienced seven crises, Mexico had five, and Chile three. Carlos A. Vegh and Guillermo Vuletin (2013) stated that Latin America had a financial crisis roughly every two years until 2001. During this period, most Latin American countries faced hyper-inflation. In the early 2000s, these countries finally achieved macroeconomic stability in terms of steady GDP growth and low inflation.

The study by De la Torre, Martínez Pería, and Schmukler (2010) provided evidence that immediately after economic stability had been achieved, many banks in emerging market countries identified SMEs as a strategic market to penetrate. According to this study, by the mid-2000s all large banks in Argentina and Serbia were actively involved with SMEs (Figure 5). In Chile over 85% and in Colombia over

⁶ **World Bank.** 2010. World Bank Enterprise Surveys. Turkey, Financial Crises Survey. <https://www.enterprisesurveys.org/portal/index.aspx#/library?dataset=Enterprise%20Survey> (accessed April 09, 2014).

75% of large banks were actively lending and providing banking services to SMEs (Figure 5).



Source: Based on data by De la Torre, Martínez Pería, and Schmukler (2010).

Figure 5 Banks' Involvement with SMEs in Four Emerging Economies

Another study, by Beck, Demirgüç-Kunt, and Maksimovic (2008), suggested that there is a strong relationship between financial development, economic stability and SMEs' use of external finance, which is mainly explained by bank finance. The researchers found that firms in countries with better financial intermediaries use more external finance. Regarding economic stability, they found that high inflation has a negative effect on SMEs' use of bank credit. Furthermore, similar cross-country studies covering over 100 banks, conducted by the IFC and the World Bank, provided evidence that the perception of the high profitability of the SME sector was the main motivation for banks to become involved with SMEs (Beck, Demirgüç-Kunt, and Maksimovic 2008; IFC 2010; Rocha et al. 2010; Fuchs et al. 2011).

As summarized above, the current research on banks' involvement with SMEs in Turkey and other emerging market countries suggest that there is a possible relationship between the macroeconomic environment and banks' financing of SMEs. This research analyzes the significance of this relationship in Turkey and in five other emerging market countries. The empirical models are developed and the findings are presented in the following sections.

4. Empirical Analysis

We use regression analysis to test the relationship between the macroeconomic factors and commercial bank lending to SMEs in Turkey and in the five other emerging market countries, namely Argentina, Brazil, Mexico, Chile, and Poland. As the time series data on SME bank credit is available only for Turkey, we use time series analysis for Turkey and panel data analysis for the other five countries. The data used in the regression analysis are obtained from secondary sources such as the World Bank, OECD, Banks Association of Turkey, and BRSA. In Turkey, data on SME bank credit is available from 2007 onwards; therefore, our analysis is limited to the period between 2007 and 2015. We use quarterly data for all the variables and convert them into real values using the 2003 consumer price index (CPI).

4.1 Empirical Analysis for Turkey

4.1.1 The Model

This study uses a growth model in which both dependent and explanatory variables are measured as the percentage change. All the data are given quarterly and their growth rates are calculated as the percentage change from the previous quarter. The equation of the model is:

$$SME\ bank\ credit = f(GDP\ growth, Inflation, Government\ debt, Bank\ competition)$$

$$SME\ bank\ credit\ growth = \alpha + \beta_1 GDP\ growth\ rate + \beta_2 Inflation\ rate + \beta_3 Gov.\ debt(\%change) + \beta_4 Bank\ concentration(\%change) + \epsilon \quad (1)$$

In this model, the coefficient α is the intercept of the regression line that represents the constant growth of SME bank credit, regardless of the effect of independent variables. β_1 , β_2 , β_3 , and β_4 are the corresponding coefficients of the independent variables GDP growth, inflation, government borrowing, and bank competition, respectively. They represent the proportional effects that the corresponding variables have on the growth of the dependent variable. A positive sign in these coefficients would indicate a positive effect on the growth of SME loans, and a negative sign a negative effect. We expect that real GDP growth is positively related to SME bank credit growth, whereas inflation, public sector debt, and bank concentration are negatively related to SME bank credit growth. Lastly, ϵ is the error term, which accounts for the effect of other factors that cannot be explained by the model.

4.1.2 Regression Results

The regression results for Turkey show that all our independent variables have the expected signs. According to the results, there is a significant and positive relationship between GDP growth and SME credit growth at the 1% significance level. In contrast, we see a negative relationship between SME loan growth and the rest of the independent variables (inflation, government debt, and bank concentration ratio), indicating that any increase in these variables will reduce the amount of bank credit lent to SMEs (Table 1).

Table 1 Regression Results for Turkey

Variable	Coefficient	Std. error	t-statistic	Probability
GDP	0.87	0.31	2.78	0.01***
INFLATION	-0.92	0.48	-1.92	0.06*
GOVDEBT	-0.26	0.12	-2.29	0.03**
BANKCR	-0.49	0.59	-0.83	0.41
C	3.75	1.19	3.14	0.00***

$R^2 = 0.32$

Adj. $R^2 = 0.23$

F-statistic = 3.52 (Prob. = 0.01***)

Note: Data for all variables are expressed as the percentage change (growth) from the previous quarter; *coefficient is significant at $\alpha = 10\%$, **coefficient is significant at $\alpha = 5\%$, ***coefficient is significant at $\alpha = 1\%$.

Source: Authors' calculation.

Nevertheless, the coefficient of determination, R^2 (0.32) and the adjusted R^2 (0.23) are not very high, despite the fact that the F -statistic (3.52) is statistically significant at the 5% significance level (Table 1). These low R^2 values indicate that there may be some missing variables in our model, such as interest rates, or other factors that influence banks' lending to SMEs.

First, we attempt to improve our model by adding the real interest rates as an independent variable to our base model. However, the regression results remain the same without any significant improvement in the R^2 and the adjusted R^2 .

Second, we include one period lagged value of the dependent variable, SME credit growth, $SME(-1)$, in our model as an explanatory variable. This improves the robustness of our model significantly, with the R^2 becoming 0.53 and the adjusted R^2 0.45 (Table 1a). Furthermore, the estimated coefficient of the $SME(-1)$ is positive and significant at the 1% level. This finding shows that the current SME credit growth rate is positively and significantly affected by its own one period lagged value. This lagged value effect is likely to be the result of banks' strategic expansion in the SME market in Turkey. Over the past decade, banks have been investing in their SME lending infrastructure, such as the branch network, personnel, IT infrastructure, and financial products for servicing SMEs. It is very likely that these developments will have a prolonged effect on banks' SME credit growth in Turkey.

Table 1a Regression Results for Turkey (with Lagged Effect)

Variable	Coefficient	Std. error	t-statistic	Probability
SME(-1)	0.48	0.13	3.55	0.00***
GDP	0.73	0.27	2.68	0.01***
INFLATION	-0.99	0.41	-2.40	0.02**
GOVDEBT	-0.19	0.10	-1.82	0.07*
BANKCR	-0.36	0.56	-0.64	0.52
C	2.58	1.079	2.39	0.02**

$R^2 = 0.53$

Adj. $R^2 = 0.45$

F -statistic = 6.33 (Prob. = 0.00***)

Durbin-Watson statistic = 1.99

Note: Data for all variables are expressed as the percentage change (growth) from the previous quarter; *coefficient is significant at $\alpha = 10\%$, **coefficient is significant at $\alpha = 5\%$, ***coefficient is significant at $\alpha = 1\%$.

Source: Authors' calculation.

As in the base model, the estimated coefficients of all the independent variables have the expected signs. The positive coefficient of GDP is significant at 1%, and the negative coefficients of inflation and government debt are significant at the 5% and 10% levels, respectively. The bank concentration ratio does not appear to be significant, although the estimated coefficient has the expected negative sign. This result may simply be due to measurement error, because the bank concentration ratio does not fully capture the market competition. Therefore, a more representative measure of competition, such as a nonstructural approach that considers bank entry and exit barriers, ease of foreign banks' entry, and other competitive market behavior, might increase the level of significance. However, owing to data limitations it was not possible to use this approach in our model.

Assuming other factors remain unchanged, the results of our lagged model indicate that every 1% of quarterly growth in real GDP contributes 0.73% of quarterly real growth of SME bank credit in Turkey. As expected, inflation alone shrinks SME credit growth in real terms by 0.99%. The government debt is also statistically significant and the coefficient is negative, which is consistent with the theoretical expectation of the crowding-out effect. The estimated coefficient of government debt implies that if the growth of government debt decreases by 1%, SME bank credit growth will increase by 0.19% each quarter.

We use the Pearson correlation analysis to check for the multi-collinearity problem within the independent variables. The Pearson correlation matrix presented in Table 1b shows that there is no significant association within the independent variables; in other words, there is no multi-collinearity in this model. Furthermore, residual tests are carried out using EViews software. From these test results it is confirmed that the residuals are normally distributed and homoscedastic, and have no serial correlations. We can therefore assume that the model fits well for this regression analysis and that the results are robust.

Table 1b The Pearson Correlation Matrix

	SME loan	GDP	INFLATION	GOVDEBT	BANKCR
SME loan	1				
GDP	0.376** (0.026)	1			
INFLATION	-0.262 (0.129)	-0.091 (0.605)	1		
GOVDEBT	-0.166 (0.340)	0.310 (0.07)	-0.159 (0.361)	1	
BANKCR	-0.104 (0.552)	-0.152 (0.383)	-0.135 (0.439)	-0.142 (0.415)	1

Note: **correlation is significant at the 0.05 level (2-tailed).

Source: Authors' calculation.

4.2 The Empirical Analysis for Five Emerging Market Countries

4.2.1 The Model

In addition to our time series analysis on SME lending in Turkey, we carry out a cross-country regression analysis using panel data from five other emerging market countries with similar income levels, namely Argentina, Brazil, Chile, Mexico, and Poland. Most of these countries experienced similar economic and financial crises in the 1980s and 1990s. They also underwent similar economic and financial reforms and achieved economic stability and growth in the early 2000s. The regression equation we use for the panel data analysis is:

$$\text{Private credit} = f(\text{GDPgrowth}, \text{Inflation}, \text{Gov.debt}, \text{Bank competition})$$

$$\begin{aligned} \text{Private credit}(\% \text{change}) = & \alpha + \beta_1 \text{GDPgrowth rate} + \beta_2 \text{Inflation rate} + \\ & + \beta_3 \text{Government debt}(\% \text{change}) + \beta_4 \text{Bank concentration}(\% \text{change}) + \epsilon. \end{aligned} \quad (2)$$

Owing to a lack of historical data on SME credit for the five emerging market countries, we use the growth rate of private sector credit as a proxy for SME credit growth. Considering that SMEs make up over 98% of total private businesses in these countries, we expect that private sector credit growth will be a good estimate of SME credit growth. In this model, we use annual data and extend the period back to 1998. The growth rate of all the variables are computed by taking the percentage change from the previous year.

4.2.2 Results of the Panel Data Analysis for Five Emerging Market Countries

The panel regression analyses are carried out using the fixed effect approach for each country in the panel. When we use our base model without considering any lag effect, the regression results do not appear to be satisfactory. Therefore, we proceed to use the same model with one and two period time lags for government debt. This improves the results and robustness of our model (Table 2).

Table 2 Regression Summary for Panel Regression Model (with Lagged Effect)

Variable	Coefficient	Std. error	t-statistic	Probability
GDP	0.80	0.37	2.13	0.03**
INFLATION	-0.50	0.27	-1.82	0.07**
GOVDEBT(-1)	-0.11	0.04	-3.04	0.00***
GOVDEBT(-2)	-0.10	0.04	-2.64	0.01***
CR	-0.05	0.11	-0.47	0.64
C	4.41	2.24	1.97	0.05

$N = 80$

$R^2 = 0.65$

Adjusted $R^2 = 0.50$

F -statistic = 4.22 (Prob. = 0.00***)

Durbin-Watson statistic = 1.7

Note: Data for all variables are expressed as the percentage change (growth) from the previous quarter; *coefficient is significant at $\alpha = 10\%$, **coefficient is significant at $\alpha = 5\%$, ***coefficient is significant at $\alpha = 1\%$.

Source: Authors' calculation.

The results of the panel data analysis for the five emerging market countries indicate that, except for the “bank concentration” variable, the coefficients of all other variables are significant. In addition, the signs of estimated coefficients appear to be consistent with our expectations: private sector credit growth is positively related with GDP growth rate, but negatively related with inflation rate, government debt, and bank concentration ratio. These results are in line with the results of the time series analysis for Turkey. Furthermore, the coefficient of government debt is significant for one and two lagged periods, meaning that government debt has a persistent negative effect on private sector credit. An increase in the current year government borrowing will be crowding-out the private sector lending for at least the next two years.

The R^2 of this model indicates that 65% of the change in the private credit growth can be explained by the change in the independent variables. The F -statistic of 4.22 is significant at the highest precision. The value of the Durbin-Watson statistic of 1.7 lies above the upper limit (dU) of the Durbin-Watson table, rejecting the

null hypothesis of serial correlation in the residuals. This confirms that there is no serial correlation in the model. The Jarque-Bera test confirms that the residuals are normally distributed.

5. Concluding Remarks

Contrary to the decades-long argument that it is not feasible for banks to finance opaque SMEs, in recent years banks in emerging market countries have started to identify SMEs as their target group for lending. This study argues that the swift change in banks' attitudes toward SMEs is due to the favorable changes in the macroeconomic environment in emerging market countries. We expect that banks' lending to SMEs is encouraged by economic growth, stability, and market competitiveness, but discouraged by high inflation and government borrowing. Our empirical findings for Turkey and five other emerging market countries, namely Argentina, Brazil, Mexico, Chile, and Poland, support these expectations.

Furthermore, our empirical findings show that in Turkey, the current SME credit growth rate is positively and significantly affected by its own one period lagged value. This can be explained by banks' strategic expansion in the SME market in Turkey during the past ten years. Once the economy was stabilized in 2005, banks started to establish their SME banking departments and expanded their branch network, personnel, and IT infrastructure to serve bigger numbers of SMEs. These developments have had a prolonged positive impact on the SME credit growth in subsequent periods.

Another significant finding of our research is the persistent and negative impact of government debt on private sector credit growth. The panel data analysis for five emerging market countries shows that government debt has a negative and significant coefficient for one and two lagged periods. This indicates that an increase in the current year government borrowing will crowd out private sector lending for at least the next two years.

This research provides quantitative evidence to support the recent World Bank findings on SME finance in emerging market countries (De la Torre, Martínez Pería, and Schmukler 2010; IFC 2010). The World Bank studies showed that where there is economic stability and high economic growth, as well as high market competition in corporate lending, banks tend to have greater exposure to SME lending. This highlights the importance of keeping the government budget deficit under control, having a stable economy, and promoting policies that will increase competition in corporate lending. It is recommended that further research should analyze whether the increased competition in SME lending will eventually help to reduce the higher loan rates currently charged to SMEs.

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