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Transmission of Sovereign Risk to Bank Lending

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Summary:

Banks hold a significant exposure to their own sovereigns. An increase in sovereign risk may hurt banks' balance sheets, causing a decrease in lending and a decline in economic activity. We quantify the transmission of sovereign risk to bank lending and provide new evidence about the effect of sovereign risk on economic outcomes. We consider the 1999 Marmara earthquake in Turkey as an exogenous shock leading to an increase in Turkey's default risk. Our empirical estimates show that, for banks holding a higher amount of government securities, the exogenous change in sovereign default risk tightens banks' financial constraints significantly. The banks' resulting tighter financial constraints translate into lower credit provision, suggesting that there is a significant balance-sheet channel in transmitting a higher sovereign default risk toward real economic activity.

Key findings:

1. We show that the exogenous change in sovereign default risk tightens banks' financial constraints significantly for banks that hold a higher amount of government securities.

2. The resulting tighter bank financial constraints translate into lower credit provision, suggesting that there is a significant balance-sheet channel in transmitting a higher sovereign default risk toward real economic activity.

Center Affiliation: Center for Quantitative Economic Research

JEL Classification: E32, F15, F36, O16

Key words: banking crisis, bank balance sheets, lending channel, public debt, credit supply

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1 Introduction

In many countries, banks hold a significant credit to their own sovereigns. Lending to the governments increases the exposure of the domestic financial institutions to sovereign risk. As the risk of sovereign default increases and sovereign rating gets downgraded, the net worth of banks that hold sovereign debt goes down. Such an increase in sovereign risk constitutes a direct balance sheet shock to the banks that hold sovereign debt and reduces the eligibility of sovereign bonds as collateral to secure funding. Higher sovereign risk can also affect banks' financial performance by reducing the collateral value of the sovereign bonds and thereby banks' ability to secure funding. Because banks play a pivotal role in supplying credit to the private sector, sovereign risk's effect on banks' balance sheets could have an impact on banks' lending to the nonfinancial sector. Hence, the reduction in bank credit to the private sector is an important transmission channel through which sovereign risk could hurt the economy. Such transmission played out most notably in the 2012 eurozone crisis. However, the surge in government borrowing across both advanced and emerging markets, spurred by the COVID-19 crisis, has returned concerns about sovereign risk to the fore.

Nevertheless, quantifying the effect of sovereign risk on bank balance sheets and credit provision is a challenging task. In particular, it is difficult to identify a causal relationship between sovereign risk and banking sector distress due to the bank-sovereign doom loop episodes, which underline the well-known facts about the coincidence of sovereign crises and banking crises. First, sovereign risk can increase endogenously due to weak banks. Banks under financial stress face a risk of becoming insolvent. As governments recapitalize banks to backstop the financial system as a lender of last resort, such bailouts can increase sovereign risk. Second, the bank balance sheet shocks are mostly anticipated and unfold simultaneously with the sovereign debt crisis. For example, banks can actively manage their balance sheet by buying or selling government bonds in response to changes in sovereign risk. In this case, one can erroneously attribute the change in bank lending to other factors, conclude that sovereign risk does not increase from lending through bank balance sheets, or both. Third, if troubles in the banking sector or increased sovereign risk, or both, lead to a recession and increased uncertainty, the private sector's demand for credit will go down. Therefore, in the absence of an exogenous shift in credit supply conditions while demand remains constant, the variations in the credit provision can simply reflect the recessionary environment that is potentially affecting loan demand rather than the deterioration in bank balance sheets, which potentially affect the supply.[1]

This article summarizes our work in Başkaya et al. (2023), which investigates the link between government bonds, banks' financial constraints, and credit market disruptions. We rely on micro data on banks' balance sheets for Turkey to disentangle factors affecting loan demand from loan supply. We consider the 1999 Marmara earthquake in Turkey as an unanticipated exogenous fiscal shock that elevated the country's sovereign risk in the empirical analysis.

[1] Başkaya et al. (2023) presents a theoretical model that features the balance sheet channel.

Hence, our analysis provides causal evidence on the balance sheet channel. Başkaya et al. (2023) specifies the empirical strategy with detailed analysis. By using both various measures on banks' financial health and the conceptual framework on how government securities affected banks' financial constraints and further lending behavior, we shed light on potential mechanisms whereby exogenous increases in sovereign default risk affect the credit provision—and potentially the real economy—through its effect on banks' financial performance.

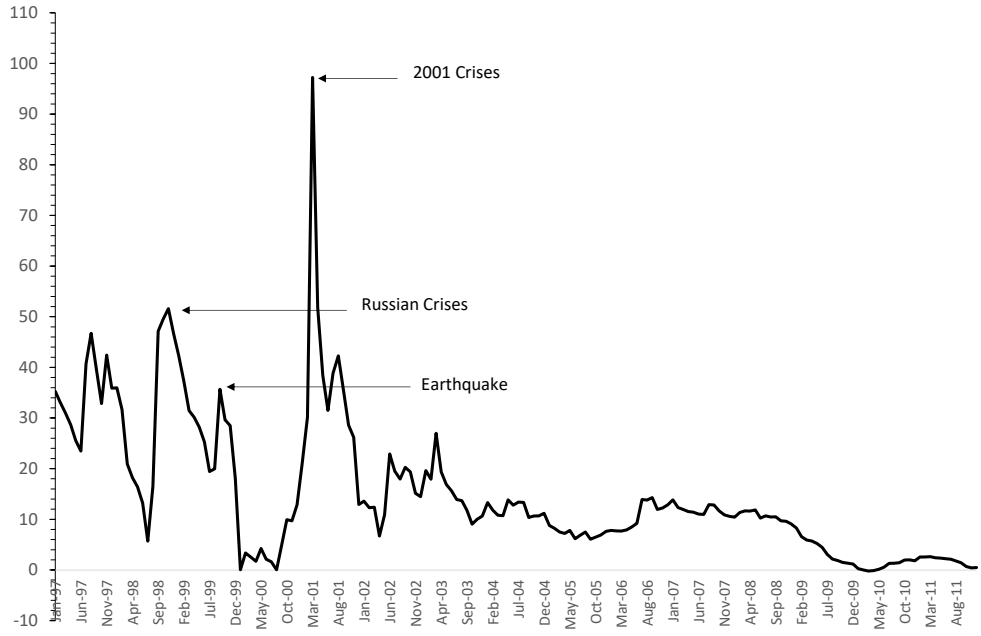
2 Unexpected Fiscal Shock Increased Sovereign Risk

Our empirical strategy relies on the size and the unanticipated nature of the fiscal shock that results in an increase in the sovereign risk. The 1999 Marmara earthquake in Turkey was an unanticipated, exogenous fiscal shock that elevated Turkey's sovereign risk. The Marmara earthquake hit the industrial heartland of Turkey on August 17, 1999, and registered 7.6 on the Richter scale. In terms of the size of the fiscal shock, the Marmara earthquake is significant. The Marmara region accounts for 25 percent of Turkey's population, 35 percent of its gross national product, and 50 percent of its industrial production. The earthquake is considered one of the top ten in the US Department of Commerce's database of significant earthquakes. The earthquake cost $20 billion USD or 11–12 percent of Turkey's GDP as of 2000. The unanticipated nature of the shock makes it impossible for banks to accumulate or run down government debt in expectation of sovereign risk, allowing us to exclude moral hazard or risk-shifting scenarios, or both, resulting from sovereign default expectations.

Figure 1 shows that following the earthquake, the spreads on government bonds went up, indicating an increase in default risk.[2]

[2] We use the terms debt, securities, T-bills, and bonds interchangeably to refer to all types of government securities issued by the Turkish government.

Figure 1: Average Ex-Ante Real Interest Rate on Government Debt (Percent)



Note:
Source: Authors' calculation

It is important to compare the earthquake with the Russian financial crises and the 2001 Turkish financial crisis for the purpose of assessing the causal effect of an exogenous increase in the sovereign risk on bank balance sheets and lending behavior. The increases in the real interest rate during the Russian crisis and the 2001 Turkish crisis were higher. Although different from the 1999 earthquake, the Russian crisis is associated with a sizable recession in Turkey, which also suppressed the demand for loans as the Turkish economy was hit as a result of its exposure to exports to Russia. On the other hand, during the earthquake, there was no evidence of a decline in loan demand, there were no widespread defaults, and no recession occurred, either regionally or nationally. Banking data show no rise in nonperforming loans. Because the crisis was quite anticipated starting from late 2000, the 2001 Turkish crisis does not provide us a clean experiment for assessing the causal effect of an exogenous increase in sovereign risk on bank balance sheets and lending behavior.

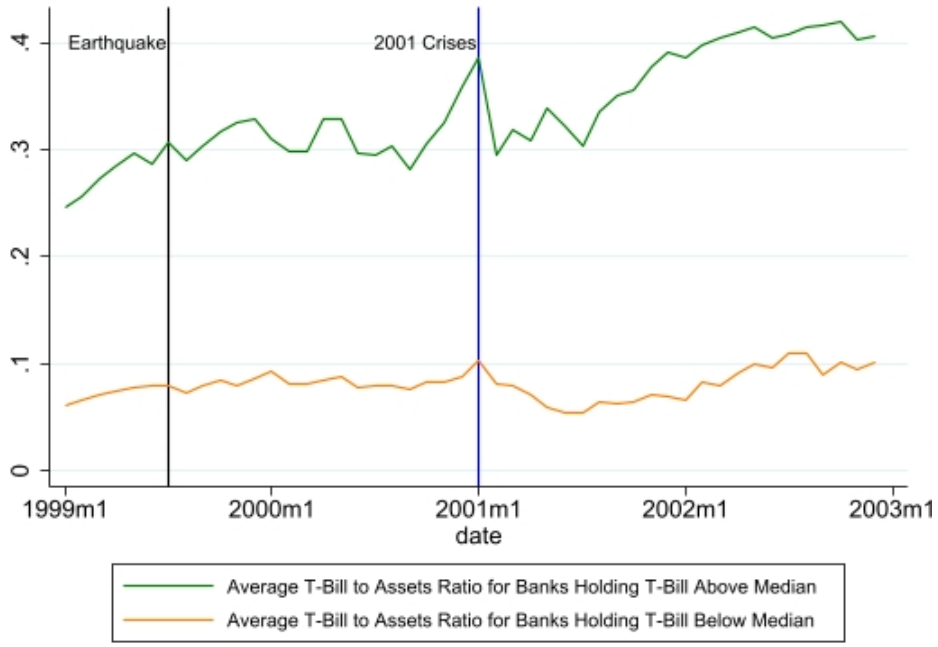
3 Banks' Government Bond Holdings and Balance Sheets

We use administrative monthly bank balance sheet data from Turkey for 1997–2011 to analyze how banks' exposure to sovereign debt at the time of the unanticipated exogenous shock affected their financial constraints and credit provision in the aftermath of the earthquake. The data are from banks' regulatory filings on their exposure to government debt. All banks operating

within Turkey are obligated to report their balance sheet,s as well as extra items, by the end of month to the regulatory and supervisory authorities, such as the Central Bank of the Republic of Turkey and the Banking Regulation and Supervision Agency. Using Turkey's micro-level data, we analyze how financial constraints of banks with varying levels of exposure to government securities responded to exogenous shock to sovereign risk induced by the earthquake.

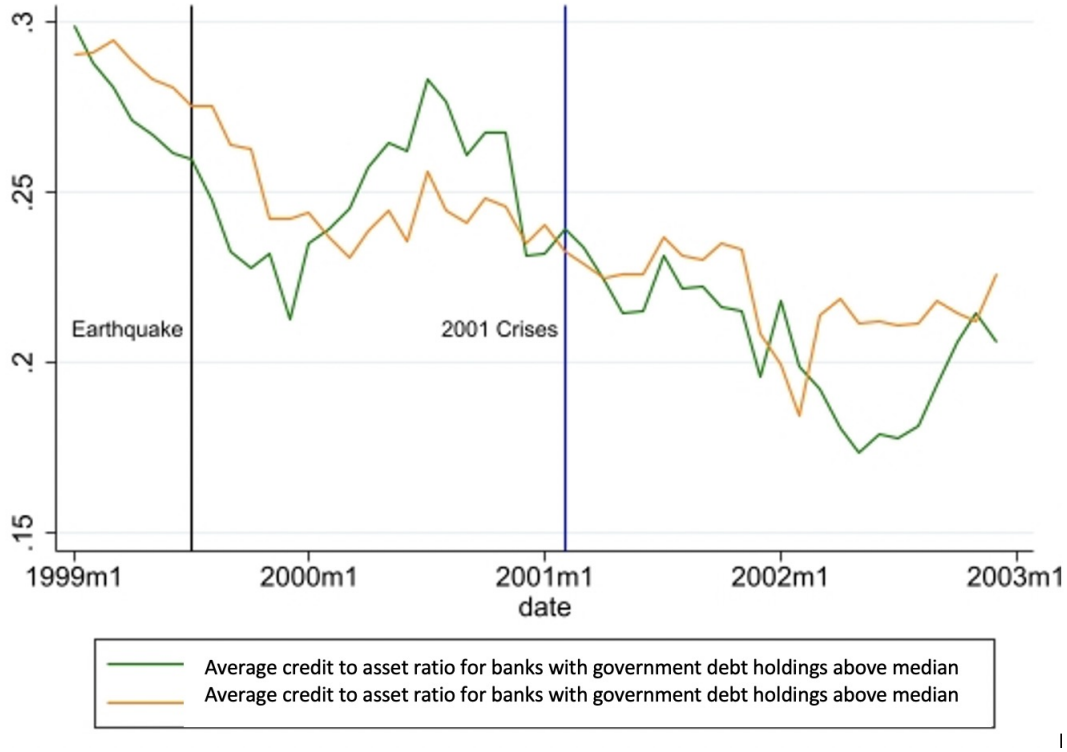
Figure 2 plots the share of government debt holdings in banks' total assets for the banks above and below the median level. When the sovereign risk increases, the value of the government bonds declined, constituting a negative shock to banks' balance sheets. The shock was stronger for banks with high ex-ante exposure to sovereign debt. Such a decrease would imply an even larger decline in the value of bank loans. Figure 3 illustrates that banks with more exposure to government bonds reduce lending to the private sector more. Başkaya et al. (2023) shows that these banks have lower net worth and profit and tighter financial constraints based on a bank-specific measure. The data also show that banks' assets dropped as sovereign risk increases. Banks also shifted assets to other assets, including interbank claims.

Figure 2: Government Debt Holdings as a Ratio of Banks' Total Assets



Note:
Source: Authors' calculation

Figure 3: Lending to the Private Sector as a Ratio of Banks' Total Assets



Note:
Source: Authors' calculation

Finally, we quantify the impact of the fiscal shock on bank lending. Table 1 shows that the impact is economically significant. Our estimates imply that a bank that holds 18 percent of its assets in government debt (the average in our sample) decreases the credit-to-assets ratio by 3.5 percentage points during regular times (a normal crowding-out effect) and by an additional 1.5 percentage points during the earthquake. These are sizeable effects. The actual decline in credit to assets rate is 3 percentage points during the earthquake period. Hence, our estimates can explain half of the actual decline in credit provision from August to November 1999, on average. Başkaya et al. (2023) also contains an estimation about the effect of increasing government bond yields on lending given sovereign exposure and finds similar spillover effect.

Table 1: Earthquake and Lending: Time-Varying Panel

	(1)	(2)	(3)
Gov Bond Holdings$_{it-1}$ × Earthquake$_t$	-0.0607*	-0.0754**	-0.0763**
	(0.0351)	(0.0376)	(0.0342)
Gov Bond Holdings$_{it-1}$	-0.214***	-0.195***	-0.193***
	(0.0361)	(0.0384)	(0.0387)
Gov Bond Holdings$_{it-1}$ × Russia$_t$		0.00206	0.00251
		(0.0532)	(0.0532)
Gov Bond Holdings$_{it-1}$ × Asia$_t$		0.000722	-0.000287
		(0.0978)	(0.0975)
Gov Bond Holdings$_{it-1}$ × 2001 Crisis$_t$		-0.0548	-0.0546
		(0.0355)	(0.0356)
Observations	5061	5061	5061
R^2	0.121	0.123	0.124
Banks	82	82	82
BankFE	Yes	Yes	Yes
TimeFE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
ControlsXEarthquake	No	No	Yes

Note: Dependent variable is private lending. Earthquake is a dummy equal to 1 for August 1999–November 1999. Asia is a dummy equal to 1 for July 1997–October 1997. Russia is a dummy equal to 1 for September 1998–November 1998. 2001 Crisis is a dummy equal to 1 for December 2000–December 2001. Controls include lagged values of interbank assets, cash holdings, and capital. All variables are normalized by assets. Sample spans 1997–2002. R^2 is within R^2. Errors are clustered at the bank and month levels. * p $<$ 0.10, ** p $<$ 0.05, *** p $<$ 0.01

4 Conclusion

The “diabolic loop” between sovereign and bank credit risk was at the center of the 2009–12 sovereign debt crisis in the periphery of the euro area. We identify the effect of government debt on banks’ balance sheet health and credit provision. We use data from the universe of banks in Turkey to identify and quantify the impact of a sovereign shock on the banking sector. For identification, we use a rare disaster—the 1999 Marmara earthquake—one of the largest earthquakes in world history—as a major unanticipated fiscal shock. Our empirical results validate the theory of banks’ financial constraint, showing that lending fell as this constraint tightened and that the earthquake-induced shock led to balance sheet effects and tightened constraint. We then provide causal evidence for this balance sheet channel in lending, as high government debt exposure during the earthquake resulted in lower private lending compared to similar banks with low exposure, including by pushing up government yields. We quantify these effects, estimating that exposure to sovereign debt accounted for nearly half of the observed lending decline following the earthquake. Our results provide evidence about the link between

fiscal distress and financial imbalances, where the causality goes from fiscal to financial stress and affects the real sector.

References

Başkaya, Yusuf Soner, Bryan Hardy, Şebnem Kalemli-Özcan, and Vivian Yue. 2023. Sovereign risk and bank lending: Theory and evidence from a natural disaster. Federal Reserve Bank Atlanta working paper no. 2023-1, February.