Journal of International Economics 97 (2015) 209–230

Contents lists available at ScienceDirect

Journal of International Economics

journal homepage: www.elsevier.com/locate/jie

The impact of foreign liabilities on small firms: Firm-level evidence from the Korean crisis☆

Yun Jung Kim [a], Linda L. Tesar [b,c], Jing Zhang [d,*]

[a] Sogang University, South Korea
[b] University of Michigan, USA
[c] NBER, USA
[d] Federal Reserve Bank of Chicago, USA

ARTICLE INFO

Article history:
Received 25 April 2014
Received in revised form 27 May 2015
Accepted 27 May 2015
Available online 1 June 2015

JEL classification:
F32
F34
E44

Keywords:
Financial crisis
Firm-level data
Balance-sheet effects
Korean economy

ABSTRACT

Using Korean firm-level data on publicly-listed and privately-held firms together with firm exit data, we find strong evidence that holdings of foreign-currency denominated debt negatively affected the economic performance of small firms during the 1997–98 crisis. The large exchange rate depreciation that occurred during the crisis resulted in a decline in net worth for firms with foreign-currency denominated debt on their balance sheets. Small firms with more short-term foreign debt were more likely to declare bankruptcy. Conditional on surviving the crisis, small firms that had more short-term foreign debt experienced larger declines in sales. The exit (bankruptcy) margin accounts for a large fraction of small firms' adjustment during the crisis.

1. Introduction

The sequence of events experienced by an emerging market undergoing a financial crisis is now all-too-familiar. Rapid economic growth and financial market liberalization encourage capital inflow, contributing to an overvalued exchange rate and increased reliance on foreign credit, usually denominated in US dollars. At some point, when economic growth and exports slow, the economy tips into crisis. The exchange rate collapses, capital flows reverse and firms find themselves unable to meet their debt requirements. Firms, and in some cases governments, become insolvent. Those deemed "too big to fail" may receive bailouts; others slash employment, declare bankruptcy or are sold to foreign owners.

While the general anatomy of crises has been well documented,[1] the channels through which a financial crisis translates into a real economic contraction at the microeconomic level are less well understood. A wide range of macroeconomic models predict that a depreciation of the exchange rate is expansionary by making exports more competitive (an export-expansion effect). On the other hand, models with financial frictions predict that an exchange rate depreciation is contractionary if firms have foreign-currency denominated liabilities on their balance sheets (a balance-sheet effect) (see, for example, Krugman, 1999; Céspedes et al., 2004; Feldstein, 1999). In general, the empirical literature has found ample evidence of the export-expansion effect but limited evidence of the balance-sheet effect. The fact that the evidence has pointed to a *positive* export-expansion effect has made it difficult to explain the steep output drop that occurs following balance of payments crises in small open economies. Our paper helps resolve this difficulty: in the case of Korea, the balance-sheet effect is found to be important for small, non-exporting firms that enter the crisis with short-term foreign-currency denominated debt.

We use a detailed database that includes more than 4000 Korean firms to study the impact of the 1997–1998 Korean financial and currency

☆ The authors would like to thank Chris House, Andrei Levchenko, Kathryn Dominguez, Amy Dittmar, and participants of seminars at the University of Michigan, the Australian National University, Sciences Po and the 2013 Economics Joint Conference in Korea. This work was supported by the National Research Foundation of Korea grant funded by the Korean Government (NRF-2013S1A5A8023475).

* Corresponding author.
E-mail addresses: yunjungk@sogang.ac.kr (Y.J. Kim), ltesar@umich.edu (L.L. Tesar), jzhangzn@gmail.com (J. Zhang).

[1] See for example Corsetti et al. (1999).

http://dx.doi.org/10.1016/j.jinteco.2015.05.006
0022-1996/

crisis on firm performance. Our database has a number of advantages relative to those used in previous studies. First, it includes information on publicly-listed as well as privately-held firms. This enables us to study the impact of the crisis on small firms, where the balance-sheet effects of holding unhedged, foreign-currency denominated debt were particularly acute. Second, the database contains firm-level information on export status, holdings of foreign debt, and total indebtedness together with a host of other variables. This allows us to condition on a number of firm-specific characteristics so that we can partially control for bias due to endogeneity. Third, the database provides information about firm exit during the crisis. We exploit heterogeneity across firms to examine whether exposure to foreign debt is critical for explaining firm performance and firm exit during the Korean crisis.

Our empirical strategy is to regress measures of firm performance during the crisis on the pre-crisis foreign debt ratio. Using the lag in foreign debt holdings partially alleviates concerns about potential endogeneity between foreign debt holdings and firm performance. We further control for firm characteristics that are potentially related to foreign debt holdings and firm performance, including the export/sales ratio, size, age, an industry dummy, a chaebol dummy, leverage, and the short-term debt ratio.[2] Finally, to the extent that unobserved omitted variables operate in a time-invariant fashion, the results from a regression in the pre-crisis period can serve as a benchmark for assessing the impact of the large exchange rate deprecation that occurred during the crisis.

Our analysis yields three key findings on the magnitude and significance of balance-sheet effects. First, we find a negative relationship between foreign debt and firm net worth. This relationship is significant only during the crisis. Second, conditional on survival, foreign debt exposure has a negative effect on firm performance, particularly for small firms. Again, the relationship between firm size, foreign debt and firm performance is significant only during the crisis. To illustrate the magnitude of this effect, consider a firm at the 10th percentile of the size distribution (with size measured by real assets). For this firm, a 10% increase in its net short-term foreign debt to net worth ratio prior to the crisis is associated with a 1.7% reduction in real sales growth during the crisis. Third, we find that foreign debt holdings are a significant predictor of small firms' exit during the crises. For a firm at the 10th percentile of the size distribution, a 10% increase in its net short-term foreign debt ratio is associated with an increase of 1.3% in the probability of exit. Firm exit accounts for nearly 24% of the decline in aggregate sales in the peak year of the crisis.

Our finding of a significant, negative balance-sheet effect, particularly for small firms, stands in contrast to most of the empirical work in this area, which reports either no effect or a *positive* balance-sheet effect.[3] There are several explanations for the difference in findings. Most firm-level studies on emerging markets focus on publicly-listed firms. Publicly-listed firms tend to be large and are more likely to be exporters. Our data allows us to include small, privately-held firms where balance-sheet effects turn out to be particularly important. Our specification also includes an interaction between firm size and financial variables. By allowing the balance-sheet effect to vary across firm size,[4] we are able to uncover the strong balance-sheet effect on small firms. Finally, most previous analyses study only surviving firms. Analysis of exit rates underscores the devastating impact of the crisis on small firms that had foreign liabilities prior to the crisis.

Our empirical evidence identifies a strong export-expansion effect: exporters experience smaller declines in sales growth during the crisis than non-exporters. While in principle exports provide a natural hedge against the negative effects of an exchange rate depreciation and could provide a counter-weight to the negative balance-sheet effect, many firms do not export and therefore do not benefit from this channel. Our data suggest that only 30% of Korean firms that carried foreign currency debt on their balance sheets at the time of the crisis were exporters. Moreover, for the smallest quartile of firms, 90% of firms with foreign debt holdings were non-exporters. Therefore, a significant fraction of the population of Korean firms—importantly, most small firms—entered the crisis with exposure to balance-sheet risk with no potentially offsetting benefits from an improvement in export competitiveness.

Paradoxically, we find that for large firms, exposure to foreign debt is positively associated with sales growth during the crisis. Similar results have been documented in other studies that focus on large, publicly-listed firms (see, for example, Bleakley and Cowan, 2008, 2009; Benavente et al., 2003; Bonomo et al., 2003; Forbes, 2002). We also find a negative association between foreign debt and exit during the crisis for large firms. The exact interpretation of these findings is unclear. One possibility is that large firms, like publicly-listed firms, are more likely to hedge exchange rate risk and are more likely to have access to other means of financing during the crisis. Unfortunately, we do not have direct evidence on the hedging behavior of firms or their holdings of other assets. It is reasonable to assume, however, that this measurement bias is less severe for small firms than for large firms; hence the balance-sheet effects we identify are stronger for small firms.

The paper is organized as follows. Section 2 provides a brief macroeconomic overview of the Korean financial crisis and introduces the balance-sheet mechanism. The dataset used in our empirical analysis is discussed in Section 3. Section 4 presents empirical findings on the balance-sheet effects before and during the crisis for both the intensive and extensive margins. Robustness checks are performed in Section 5, and Section 6 concludes.

2. Macroeconomic dynamics of the Korean financial crisis

Prior to the Asian financial crisis, South Korea was one of the fastest growing economies in the world, with sustained high real GDP growth rates for more than two decades. Beginning in late 1997, the Korean economy entered a severe economic contraction. Some indicators of the magnitude of the crisis are illustrated in Fig. 1a, which shows real GDP, consumption, investment and total employment normalized to their 1997 values.[5] The declines were big: from peak to trough real GDP declined 7%, real consumption fell 14%, real investment fell 35%, and employment dropped 5%. During the crisis, the current account displayed a sudden reversal of over 15 percentage points, shifting from a negative balance of 4% of GDP to a positive 12% of GDP (Fig. 1b). While the crisis was deep, it was also mercifully brief. By 1999 real GDP and consumption returned to levels above their pre-crisis values.

During the boom years, Korean firms and households dramatically increased their reliance on credit. Between 1995 and 1997, total private credit as a share of GDP increased from 104% of GDP to almost 120% of GDP (see Fig. 1d). Much of the credit expansion took the form of borrowing from abroad. Fig. 1c shows that external debt peaked at the end of 1997 at 60% of GDP, with over a third of total borrowing with maturities of one year or less. The declines in both total private credit and external debt as shares of GDP from 1997 to 2000 illustrate the dramatic deleveraging that occurred in Korea in the aftermath of the crisis.

[2] Chaebols are South Korean conglomerates composed of many companies clustered around one parent company.

[3] Benavente et al. (2003), Bleakley and Cowan (2008, 2009), Bonomo et al. (2003), Forbes (2002), and Luengnaruemitchai (2003) find either a positive balance sheet effect or no balance sheet effect. In contrast, Aguiar (2005), Carranza et al. (2003), Echeverrya et al. (2003), Gilchrist and Sim (2007) and Pratap et al. (2003) find some evidence of a negative balance sheet effect.

[4] An interpretation of the firm size result is that size is a proxy for access to financial markets (see Gertler and Gilchrist, 1994).

[5] The plot shows annualized data—the crisis hit in the fourth quarter of 1997.