



Does Short-Term Debt Increase Vulnerability to Crisis? Evidence from the East Asian Financial Crisis[☆]

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ABSTRACT

Does short-term debt increase vulnerability to financial crisis, or does short-term debt reflect – rather than cause – the incipient crisis? We study the role that short-term debt played in the collapse of the East Asian financial sector in 1997–1998. We alleviate concerns about the endogeneity of short-term debt by using long-term debt obligations that matured during the crisis. We find that debt obligations issued at least three years before the crisis had a negative, albeit sometimes insignificant, effect on the probability of failure. Our results are consistent with the view that short-term debt reflects, rather than causes, distress in financial institutions.

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1. Introduction

The role of short-term debt in instigating financial crises is again being hotly debated. Short-term debt arguably exposes borrowers to roll-over risk and hence can cause and amplify financial crises. In the recent crisis, the collapse of the asset-backed commercial paper market as well as the increasing role played by short-term repurchase agreements in the balance sheets of financial institutions led financial economists to point to the fragility embedded in short-term debt and roll-over risk. As a result, there are calls to regulate the use of short-term debt in the financial system – especially in what is now known as the

shadow banking system. Likewise, in international finance there is renewed interest in the possible role of short-term debt as an indicator of vulnerability to crisis, perhaps as part of an “early warning system”.²

In contrast to this dismal view, a markedly different account of the role of short-term debt in financial crises exists in the literature, one that turns the causality from short-term debt to financial crisis on its head. According to this view, the accumulation of short-term debt may be the optimal choice for borrowers who experience a deterioration in asset quality. As Diamond and Rajan write:

Short-term debt mirrors the nature of the investment being financed and the institutional environment that enables investors to enforce repayment. It is no surprise that illiquid or poor quality investment when a bank or banking system is close to its debt capacity will result in a buildup of short-term debt. The higher likelihood of crisis stems, not from the short-term debt, but from the illiquidity and potentially low creditworthiness of the investment being financed. (Diamond and Rajan (2001a), p. 40.)

Moreover, Diamond and Rajan (2001a, 2001b) argue that maturity mismatch may be an optimal ex-ante capital structure for banks

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² For corporate finance references see: Brunnermeier and Oehmke (2010) and He and Xiong (2009), among others. For calls to regulate the use of short-term debt, see, for example, Gorton and Metrick (2010). The recent literature in international economics on short-term debt includes: Frankel and Saravelos (2010), Lane and Milesi-Ferretti (2010), and Rose and Spiegel (2010, forthcoming).

when they cannot commit to fully repay investors once a project has been completed. In their model the threat of a bank run embedded in short-term debt incentivizes banks to repay investors. In this setting, if the projects being financed are seen as becoming less liquid due to an adverse shock to fundamentals, banks will find it harder to secure long-term financing from investors and as a result will increase short-term borrowing.³ Short-term debt is therefore a symptom of adverse economic shocks rather than a cause.

In this paper we study the role of short-term debt in the East Asian crisis of 1997–1998. Several East Asian economies funded their rapid growth with large amounts of short-term debt, leading many to argue that this phenomenon was one cause of the crisis. For example, according to Summers (2000), “Countries should reduce their vulnerabilities to liquidity/rollover risk and balance-sheet risk.... Policy biases toward short-term capital need to be avoided.”⁴ Likewise, other observers have argued that there was a self-fulfilling element to the crisis, since the accumulation of short-term debt shifted the affected economies into a danger zone where a crisis equilibrium could emerge.⁵ However, it is unclear whether the accumulation of short-term debt before the crisis indeed caused vulnerability or was merely a response to the weakness of the underlying economies.

Which view is closer to the facts? Was the buildup of short-term debt in East Asian economies before 1997 a cause or an effect of the incipient crisis? Our paper is the first to address this question empirically. We construct a new dataset using individual bank-level data, which includes information on banks in the five East Asian countries most affected by the crisis: Indonesia, Malaysia, the Philippines, South Korea, and Thailand. We have detailed information on these banks’ debt obligations as well as on their performance during and after the crisis. We are therefore able to link, at the individual bank level, a bank’s exposure to debt of different types and maturities before the crisis and its eventual success (or failure) in surviving the crisis.

Given the ambiguous direction of causality, it is essential to deal with endogeneity of short-term debt in the empirical analysis. We employ the following strategy to more accurately identify the effect of a bank’s exposure to roll-over risk on its probability of failure. Instead of examining the effect of short-term obligations on bank failure, we examine whether the likelihood of a bank failure is affected by long-term obligations that become due during or immediately after the crisis. Some of these debt obligations (loans, notes, and bonds) were issued several years before the crisis, and therefore are unlikely to represent a financial policy response to deteriorating economic conditions. Yet, as the debt matures during or immediately after the crisis, it increases the bank’s exposure to roll-over risk in the same way that short-term obligations do, thereby increasing the bank’s vulnerability. Using maturing long-term debt instead of short-term debt, we are able to estimate the separate effect of pure roll-over risk on bank failure.⁶

We find that obligations undertaken three years or more before the onset of the crisis and that become due during the crisis have had a negative, albeit not always significant, effect on the probability of bank failure. We interpret this result as supportive of the view of short-term debt as an equilibrium response to worsening asset quality. Our results indicate that the issuance of a debt obligation before

1995 that was scheduled to mature during the crisis years not only did not predict failure but may even have predicted success – that is, that the bank would survive the crisis. These findings are consistent with Diamond and Rajan’s view of the determination of short-term debt by predetermined deteriorating economic conditions. In contrast, the alternative view, which emphasizes roll-over risk, suggests that longer-term debt obligations that become due during the crisis should have increased failure rates. Our results suggest that although short-term debt was associated with failing institutions during the crisis, it is unlikely that exposure to roll-over risk was in itself the cause of bank failures.

Our paper is related to a large empirical literature on the cross-country association between the accumulation of short-term debt and the occurrence of financial crises.⁷ However, as Froot (2000) and Detragiache and Spilimbergo (2004) suggest, a positive and significant coefficient of short-term debt should not necessarily be interpreted as supportive of the roll-over risk view. To our knowledge, our paper is the first to address empirically the concerns about endogeneity of short-term debt in the context of financial crises.⁸

The rest of the paper proceeds as follows: Section 2 summarizes the two approaches to the role of short-term debt in financial crises and clarifies what predictions follow from each. Section 3 presents the construction of our data. Section 4 presents our identification strategy and estimation results. Section 5 concludes.

2. Short-Term Debt and Bank Failure: Theoretical Framework

In this section we describe the two approaches linking short-term debt to bank failure. According to the first approach, taking on short-term debt increases a bank’s exposure to a run, and the bank is therefore more likely to fail. The second approach emphasizes that short-term borrowing is endogenous and is potentially the only financing option available for lower-quality banks. Therefore, the likelihood of failure is not necessarily driven by short-term debt itself but rather is a consequence of the bank’s underlying economic conditions.

2.1. Short-Term Debt and Vulnerability to Financial Crises

The first approach is well illustrated in Chang and Velasco (2001). They argue that in a Diamond and Dybvig (1983) framework, early withdrawals by depositors create a role for foreign borrowing: the bank will optimally use foreign loans to repay impatient depositors. Of course, the bank may be subject to a run: if all depositors demand payment at date 1, the bank may fail.⁹ The exact conditions under which this happens, however, depend on the extent of the bank’s commitment to foreign creditors. If the bank can commit to pay foreign creditors under any circumstance, it can be sure to have access to new loans and will fail only if it cannot raise enough funds through new foreign borrowing and asset sales. In the more common case where the bank cannot commit to pay all of its foreign creditors, however, the bank’s “run zone” will be larger – it will become more illiquid and therefore more susceptible to failure in a “run equilibrium.” This is due to the failure of coordination among foreign

³ Similarly, the models by Tirole (2003) and Jeanne (2004, 2009) also emphasize the role of short-term financing as a discipline mechanism for borrowers.

⁴ Although Summers (2000) points a finger to the role of short-term debt in the crisis, he acknowledges the endogeneity of short-term debt stemming from undeveloped financial markets in emerging economies.

⁵ Contributions espousing this view as a major or an ancillary cause of the crisis include, among others, Furman and Stiglitz (1998), Radelet and Sachs (1998), Corsetti et al. (1999), Rodrik and Velasco (2000), Eichengreen (2004), and Calvo (2005). Obstfeld (1996) and Cole and Kehoe (2000) analyze the earlier Mexican crisis of 1994 along similar lines.

⁶ Our empirical approach is similar to Almeida et al. (2010) who use long-term debt maturing during the 2007 credit crisis to identify the effect of corporate debt maturity on investment.

⁷ The results are mixed. Radelet and Sachs (1998) and Rodrik and Velasco (2000) find that a high ratio of short-term debt to reserves helps predict the occurrence of capital account reversals, whereas Frankel and Rose (1996) and Milesi-Ferretti and Razin (2000) find that short-term debt has no predictive power for the occurrence of currency crises. Berg and Pattillo (1999) find an effect for some East Asian countries, but not others. More recently, Jeanne (2007) finds that short-term debt has predictive power for currency crises but not for capital account reversals.

⁸ Related papers that employ micro-level data include Eichengreen and Mody (2000), who use data on individual international bank loans to examine the pricing of risk, and Schmukler and Vesperoni (2006), who use firm balance sheets to detect the effect of financial liberalization on debt maturity.

⁹ Chang and Velasco (2000) offer an extension of this model in which debt maturity and the term structure are jointly determined. We do not test for interest rate effects in this paper due to lack of data.

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