Sovereign defaults and liquidity crises

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1. Introduction

Sovereign debt crises in emerging markets are usually associated with liquidity and banking crises. Borensztein and Panizza (2008) show that sovereign default was, in fact, a good predictor of a banking crisis in many emerging countries during the period from 1980 to 2000. The conventional view interprets domestic turmoil as an indirect consequence of foreign retaliation, for example trade sanctions or exclusion from international financial markets. Yet, this interpretation is controversial. First, there is no clear-cut empirical evidence supporting the application of “classic” penalties. Second, in recent sovereign crises (e.g., Argentina 2001 and Russia 1998) government default had a direct “balance-sheet” effect on domestic financial institutions, which were major holders of public debt (Mishkin, 2006). In this paper, I study the direct connection between sovereign defaults and liquidity crises abstracting from external penalties.

The model builds on two natural assumptions for emerging markets. First, public debt represents a source of liquidity for the private sector. Specifically, domestic firms need to refinance their projects in the future but are not able to access spot credit markets due to limited enforcement of creditors' rights. Firms then save in government bonds, either directly or indirectly through the banking sector, to hoard a reserve of liquidity. This aspect of the model is consistent with the negative correlation observed in the data between creditors’ rights protection and banks' holdings of government debt. Second, the government cannot discriminate between domestic and foreign bondholders in the event of default. This assumption, which hinges on both the anonymity and the increasing integration of secondary markets for government bonds, is consistent with the large haircuts suffered by domestic financial institutions during recent debt crises.

The implications of these two assumptions are clear. Sovereign default has opposing effects on the domestic economy as, on the one hand, it avoids a transfer of domestic resources to foreign creditors while, on the other, it generates a liquidity crisis that disrupts private investment and lowers domestic production. The trade-off faced by the government then explains the emergence of sovereign debt even in the...
absence of foreign penalties. Nevertheless, a default might occur in some states. In particular, sovereign default is countercyclical, as a drop in aggregate productivity lowers the cost of triggering a liquidity crisis, and has an amplification effect on the business cycle, as the shortage of liquidity dampens private investment and output.

Having established the link between sovereign defaults and liquidity crises, the paper discusses a novel implication of financial reforms; namely, reforms do not necessarily raise domestic welfare and, in some cases, can backfire on welfare. Consider a reform that enables domestic firms to hedge their future refinancing needs using some type of contingent contracts rather than resorting to precautionary savings in non-contingent government bonds. Conventional wisdom suggests that this reform must have a positive effect on welfare as it allows firms to reallocate efficiently liquidity across future states. However, this interpretation considers only one aspect of the reform. The reverse aspect of it is that the consequent decline in domestic holdings of public bonds makes government’s default less costly and, therefore, it might fail to recognize that the reform could involve a reallocation of capital from the public to the private sector, which would be particularly detrimental in countries with large returns on public infrastructures.

Two strands of the literature are brought together in this paper. First, the motivation for holding government bonds is based on the corporate finance approach to liquidity hoarding (e.g., Holmstrom and Tirole, 1998). According to these authors, whenever in the economy there is a demand for liquid assets which cannot be satisfied by the private sector due to a lack of commitment, the government can intervene by issuing government bonds, which are implicitly guaranteed by the government’s ability to commit agents’ income through taxation. A common counterargument, however, is that integration with a mature market, having a virtually unbounded financial capacity, could alleviate the need for government intervention in the economy; indeed, foreign bonds represent a perfect substitute for government bonds. Yet, this paper shows that this is not true in general and, therefore, the existence of a market for government bonds can enhance liquidity even in open economies. More specifically, a slight and realistic modification of Holmstrom and Tirole’s framework, that is, the inclusion of sovereign risk, implies that foreign bonds are no longer perfect substitutes for government bonds. The intuition is that the government can manipulate the returns on public bonds and make them procyclical, allowing domestic bondholders to efficiently reallocate resources across states of nature.

The second strand of the literature that is closely related to this paper includes a number of recent papers that focus on the direct consequences of sovereign default on the domestic private sector (e.g., Broner and Ventura, 2008, 2011; Guembel and Sussman, 2009; Gennaioli et al., 2009). These papers have in common with mine the lack of commitment, the government can intervene by issuing government bonds, which are implicitly guaranteed by the government’s ability to commit agents’ income through taxation. A common counterargument, however, is that integration with a mature market, having a virtually unbounded financial capacity, could alleviate the need for government intervention in the economy; indeed, foreign bonds represent a perfect substitute for government bonds. Yet, this paper shows that this is not true in general and, therefore, the existence of a market for government bonds can enhance liquidity even in open economies. More specifically, a slight and realistic modification of Holmstrom and Tirole’s framework, that is, the inclusion of sovereign risk, implies that foreign bonds are no longer perfect substitutes for government bonds. The intuition is that the government can manipulate the returns on public bonds and make them procyclical, allowing domestic bondholders to efficiently reallocate resources across states of nature.

Consider a small open economy that lasts for three periods: \( t = 0, 1, 2 \). There is a single homogenous good which is produced by a continuum of risky investment projects. Investment in each project \( j \) costs one unit of the good in \( t = 0 \) and returns \( \theta t_{1} \) in \( t = 2 \) where \( \theta \) and \( A_{1} \) denote two independent shocks realized in \( t = 1 \). \( \theta \) captures an aggregate shock, which affects all projects equally and takes values \( \theta_{j} > 0 \) with probability \( \pi_{H} = \pi(\theta_{1}) \) (good state) and \( \theta_{j} < 1 \) with probability \( \pi_{L} = \pi(\theta_{2}) = 1 - \pi_{H} \) (bad state). For simplicity, normalize the expected value of the aggregate shock to one, that is, \( \pi_{H} \theta_{h} + \pi_{L} \theta_{l} = 1 \). \( A_{1} \) captures an idiosyncratic shock, which affects each project individually and takes values \( A > 0 \) if the project is lucky and zero if the project is unlucky. Each project has an equal probability of being lucky or unlucky. In the latter case, the project admits an additional investment with variable size, \( i \), which returns \( \theta i_{2} \) in \( t = 2 \). Setting \( A/2 > 1 \) and \( \theta i_{2} > 1 \), both date 0 and date 1 investments are profitable. Fig. 1 describes the timing of investment projects.

2.2. Agents and preferences

The economy is populated by a continuum of individuals with mass one who have zero initial endowment, consume only at date 2 and are risk neutral. There are two types of individuals: entrepreneurs (firms) and workers, both with mass one half. Entrepreneurs have access to the investment technology and each one can start a single project. Workers, on the other hand, have no access to the investment technology, but derive income \( w \) at date 1. There is also a benevolent government that maximizes the average welfare of domestic individuals. At date 0, the government has access to a public investment project with rate of return \( \phi > 1 \) and maximum size \( \bar{F} \).

2.3. Financial frictions

The economy is financially integrated with an international financial market (IFM), which is risk neutral, has deep pockets and can lend/borrow at a zero interest rate. As the economy has zero initial endowment, both the entrepreneurs and the government borrow from the IFM to finance their projects. Let’s now discuss the type of financial frictions existing in

\[ t = 0 \quad t = 1 \quad \text{LUCKY} \quad t = 2 \]

\[
\begin{array}{c|c|c}
\text{Investment} & \text{Idiosyncratic Shock} & \text{Output} \\
1 & 0, \alpha & 0, \Lambda \\
\end{array}
\]

\[
\begin{array}{c|c|c}
\text{Reinvestment} & \text{Output} & \theta \rho \bar{F} \\
0, \Lambda & 0, \Lambda & \\
\end{array}
\]

\[ \text{Fig. 1. Timing of investment projects.} \]

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\(^5\) See also Sandleris (2008) and Basu (2008).
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