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Government, taxes and banking crises

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This paper analyzes the effectiveness of different government policies to prevent the emergence of banking crises. In particular, we study the impact on welfare of using taxpayers money to recapitalize banks, government injection of money into the banking system through credit lines, the creation of a buffer and taxes on financial transactions (the Tobin tax). We illustrate the trade-off between these policies and derive policy implications.

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1. Introduction

The recent financial turmoil has revived the debate concerning government responsibility in crises management. It also shows that investors, governments and depositors share their ignorance about the real quality of banks' investments, and this ignorance has been made worse by the actions of the main risk rating agencies like Moody's, Standard and Poor's and Fitch Ratings. As the crises of the 1929, Black Friday, LTCM and the subprime crises have shown, governments cannot predict the proximity of a crisis and consequently can only address it once it has already occurred.

Whenever there is a systemic banking crisis there is a need to inject liquidity into the banking system in order to avoid an excessive credit contraction.[1] Different mechanisms can be used, but all of them are costly. A recent study by Laeven and Valencia (2008) analyses 42 systemic banking crises[2] and shows that there was some kind of government intervention to rescue banks in 32 of them. In seven cases, the government bought bad assets/loans, in twelve cases, the government injected cash in banks; whereas in two cases governments provided credit lines to banks.

In the Mexican and Japanese crises, in particular, the government purchased toxic assets, but the fiscal cost of such policy was very high. In contrast, in the banking crises of Sweden, Norway and Finland, the recapitalization was done mainly by injections of public capital into the banking system. The US government, however, has hesitated on the possibility of buying toxic mortgage assets.

Therefore, governments have taken an active role in most crises. However, this has been ignored in the banking literature, which is mostly concerned with the role of the Central Bank. The aim of this paper is to analyze theoretically the role of the government in crisis management.[3] In particular, it is a well known fact that deposit insurance is not sufficient to impede systemic banking crises. While it can be effective to prevent some panic behaviour (like in Diamond and Dybvig (1983)), it is not effective when bank runs are informa-

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[1] For example, Ramírez (2009), presents evidence that a 1% increase in bank instability reduced output growth by 2–5%.

[2] Bank runs are a common feature of banking crises, with 62% of crises experiencing sharp reductions in total deposits. For example, Argentina experienced system-wide runs in the crisis of 2001. Banking panics were a common occurrence in the United States in the late 19th and early 20th century, as well as in the Great Depression and have occurred in several developing countries including Brazil 1990, Russia 1995, Malaysia 1999, Ecuador 1999 and Uruguay 2002, among others (see Laeven and Valencia, 2008).

[3] In particular, recent examples in Argentina and Uruguay (2001–2002) have shown that government policies might in some cases intensify while in others attenuate the effect of banking crises. While Uruguay kept property rights, the currency denomination of bank deposits and public debt, and promoted a mutual agreement with international debt holders, Argentina did exactly the opposite; more specifically, it "pesofied" deposits (changed the denomination of deposits from American dollars to Argentinean pesos), unilaterally declared default and devaluated the currency.

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tion induced or when many banks are affected. In these cases, other safety nets, like injection of funds, are usually needed.[4]

We model an economy where agents can deposit their money in banks[5] or privately invest it in a long term technology. In addition, agents may face a liquidity shock and become impatient depositors. Impatient depositors face a utility loss of not having enough liquid assets, and therefore the possibility of risk sharing provided by banks is generally welfare improving. In our model, the government may raise taxes so as to provide public services, as for instance education, health, social security, national security, recreation activities, etc. Taxing has an implicit cost because at the same time it lowers the availability of funds for private investments. In this paper, we show that this may exacerbate a banking crisis. Although funds might be reoriented once a crisis is expected to occur, this practice normally has an additional cost that decreases its effectiveness. In the absence of taxes, agents may not face the risk of a bank run but they do not consume public services either.

We analyze the effectiveness of the different policy options available to the government for preventing systemic banking crises, such as using taxpayers money to recapitalize banks[6] or to inject liquidity into the banking system through credit lines. We show that recapitalization dominates public lending in terms of welfare and it is less costly. In other cases, the government should create a buffer, in particular, when the cost of liquidating the public asset is low.

We also study taxes on financial transactions that exist in some developing countries like Argentina, Brazil, Colombia and Serbia. These taxes have been used extensively in emerging markets not to prevent bank runs, as we analyze in this paper, but as a way to obtain government funding. Taxes on financial transactions represent an important source of funding for those governments (22,471.9 millions of dollars for Brazil and around 2700 millions of dollars for Argentina in 2007), and can be considered as a special case of the Tobin tax. Usually those taxes are implemented over a certain period (a year, for example, in Venezuela). The existence of a tax on short term transactions creates incentives to use the assets that are not taxed, and as a result might decrease the incentives to run on banks.[7] Nevertheless, banking crises might sometimes be efficient. This is the case when using taxpayers money is too costly or too risky and/or the government is not able to reorient resources efficiently.

This article is related to several papers in the banking literature. In the seminal model by Diamond and Dybvig (1983), banks are considered to be liquidity providers, but are subject to bank runs in the form of sunspots. In our setting agents also face liquidity shocks, but bank runs are the result of a bad signal about the success of the long term project. Consequently, our paper is close in spirit to Goldstein and Pauzner (2005), where bank runs are a phenomenon closely related to the state of the business cycle.[8] Similarly, Gorton (1988) suggests that bank runs are not due to sunspots but to the existence of rational agents that modify their expectations due to a change in economic conditions (i.e., a change in the business cycle).

In the present paper, a smaller banking activity is compensated by a greater government size. Governments and banks both improve welfare but have to compete for private funds. Besides the fact that a government can provide public services, it makes banking crises more likely to occur. Also, crises occur with positive probability as in Cooper and Ross (1998) and Chang and Velasco (2000a,b).

We build on the model of Chen and Hasan (2006), although we modify their framework by introducing a government that may raise taxes so as to provide public services. Additionally, in our model, depositors receive a more informative signal about the evolution of the investment. Moreover, we investigate how governments can affect the occurrence as well as the resolution of banking crises instead of focusing only on the bank side as it is the case in most of the previous academic banking literature.[9] For open economies, Chang (2007) presents a very good approach for the coexistence of financial and political crises but without focusing neither on the financial activity of banks nor on the role of the government as a provider of public services, which are our main concerns.

The rest of the paper is organized as follows. Section 2 presents the basic features of the model. Section 3 studies bank runs and the optimal deposit contract. Sections 4 and 5 analyze different government policies to handle banking crises. Section 6 provides some comparative statics among the different policies and finally, Section 7 summarizes the concluding remarks.

2. The model

We consider a three-date (0, 1, and 2) and one-good economy. There is a continuum of agents, of measure one, in the economy. Each agent receives an endowment of one unit of the good at date 0 and can deposit it in a bank or alternatively invest it in a long term project. This long term project transforms each unit of the good at date 0 into R units with probability p and 0 with probability $(1-p)$, at date 2. Let $p = p_0$ be the prior probability of success of this project. We assume that $p_0R > 1$ and that the long term technology can be liquidated at no cost. At date 1, depositors receive a public signal $s \epsilon \{H, L\}$ on the true return of the long term project, where H reveals that the probability of success is higher than 1/2 and L reveals the contrary. Depositors update their beliefs in accord with Bayes' rule. Let p^H and p^L be the posterior probabilities of success when $s = H$ and $s = L$.[10] We assume that $p^H > p_0 > p^L$ and that $p^LR > 1$. Finally, there exists a short term technology that is not profitable at any date. In particular, this technology transforms each unit of the good at date t into $R' > 1$ units with probability p' and 0 with probability $(1-p')$ at date $t+1$, with $p'R' < 1$. Therefore, at date 0 neither banks nor agents will find it optimal to invest in such technology. However, as we show in Section 4, a government policy may induce banks to do so.

At date 0, the government may raise T taxes, with $0 < T < 1$, so as to invest in a public asset.[11] The taxpayers are both depositors and agents who privately invest in the long term project. The public asset transforms the T units of the good into public services that are con-

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[4] For example the size of the Japanese equivalent to the FDIC (Federal Deposit Insurance Corporation) was so small that it exhausted its resources almost immediately after the first bank failures in 1995 (Mishkin, 2007).

[5] In our model banks are any type of financial intermediaries that finance long term loans with short term deposits or maturity bonds.

[6] In this paper, recapitalization can be interpreted as the government buying banks' assets for less than their market value.

[7] A recent paper by Schuh and Stavins (2010) shows how small changes in relative costs of payment instruments can have important effects on their substitutability.

[8] Recent studies, see e.g., Hasman and Samartín (2008) and Hasman et al. (2008), have shown that information concerning the evolution of bank loans plays an important role not only in generating a banking crisis but also in its propagation.

[9] For an excellent review of the academic literature on banking see Gorton and Winton (2002).

[10] Therefore, $p^H \equiv \Pr[R|H] = \Pr[H|R]p_0/(\Pr[H|R]p_0 + \Pr[H|0](1-p_0))$ and $p^L \equiv \Pr[R|L] = \Pr[L|R]p_0/(\Pr[L|R]p_0 + \Pr[L|0](1-p_0))$.

[11] We assume that the size of the public expenditure, T, is exogenous. For instance, T could be the result of a political program or the rate of taxation at which maximal revenue is generated (the point at which the Laffer curve achieves its maximum). Nevertheless, the level of taxes has to be kept under certain limits. If T was unconstrained then it could result in an excessive collection of taxes that may impede participation in the banking system. The maximum T is thus related to the magnitude of the utility loss X, and the proportion of impatient agents, γ. We derive these conditions in the Appendix.

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