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On the dynamics and severity of bank runs: An experimental study[☆]

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ABSTRACT

This paper presents an experimental investigation of the factors that affect the dynamics and severity of bank runs. Our experiments demonstrate that the more information laboratory economic agents can expect to learn about the crisis as it develops, the more willing they are to restrain themselves from withdrawing their funds once a crisis occurs. Furthermore, our results indicate that the presence of insiders, who know the quality of the bank, significantly affects the dynamics of bank runs and helps mitigate their severity. We also show that deposit insurance, even of a limited type, can help diminish the severity of bank runs.

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1. Introduction

The recent financial turmoil that started in the summer of 2007 and the bank run on Northern Rock in the UK, the first bank run in the UK since the collapse of the City of Glasgow Bank in 1878, once again showed that crises and bank runs are an important feature of our financial landscape.²

[☆] The views expressed in this paper are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of New York or the Federal Reserve System.

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² Lindgren et al. (1996) show that during the period 1980–1996, of the 181 IMF member countries, 133 have experienced significant banking problems. Such problems have affected developed, as well as developing and transitional countries. Also, see Dell'Ariccia et al. (2008) for an analysis of the real effects of banking crises.

When one looks at the economic literature on bank runs (Diamond and Dybvig, 1983; Allen and Gale, 1998; Calomiris and Kahn, 1991; Chari and Jagannathan, 1988; and others) one sees a wide variety of models most of which have the same two features. With some notable exceptions (see Chen, 1999; von Thadden, 2002; Green and Lin, 2003; and Yorulmazer, 2003), most of the models on bank runs are static two-period equilibrium based models with a continuum of agents played in simultaneous move form. In many of these models, the bank-run problem is viewed as an equilibrium selection problem embedded in a coordination game in which all agents would be better off if they did not create a run on the bank (withdraw early) while it is an equilibrium to both “withdraw early” and to “withdraw late.” In addition, they mainly focus on whether deposit contracts are optimal arrangements in the presence of the possibility of a bank run.

However, Brunnermeier (2001) makes an important observation about the bank-run models in the literature: “Although withdrawals by deposit holders occur sequentially in reality, the literature typically models bank runs as a simultaneous-move game.” Since most of these models are static, they do not attempt to explain the dynamics and severity of bank runs.

In this paper, we present an experiment that concentrates on the dynamics and severity of laboratory bank runs measured by how fast money is withdrawn from the banking system during a crisis and ask questions such as³:

- Are bank runs more severe (i.e. does money get withdrawn more quickly) when depositors observe the action of other depositors and can see when they withdrew and how much they received?
- Are bank runs more severe when some depositors have insider information?
- Can partial deposit insurance be effective in mitigating the severity of bank runs?
- Is the severity of bank runs influenced by cyclical factors in the economy, that is, should we expect runs to be more severe when the economy is in a down-cycle?

While these are important issues, some of these questions cannot be answered with two-period static models. Except for a few exceptions (see Kelly and Ó Gráda, 2000 and Iyer and Puri, 2007), micro data on these issues do not exist. Therefore we chose to examine these issues in the context of experiments using a dynamic model. To our knowledge, the only experimental papers on bank runs are Garratt and Keister (2005) and Madies (2006), who do not deal with their dynamics and severity, but rather focus on their existence.

In this paper, we look at two types of policy interventions—informational and deposit insurance. With respect to the first we are interested in whether there is certain information, which, if released during the progress of a bank run, could slow it down. Such information, for example can be information about whether those who withdrew were paid or not. We also investigate the role of asymmetric information in our bank-run experiments. Here, some subjects are “insiders” who are informed about the soundness of their bank while others are not. We analyze the effect of insiders on the dynamics of bank runs and ask whether the presence of such insiders exacerbates or dampens their severity.

With respect to deposit insurance, we are interested in the minimal insurance that is needed to slow down bank runs. Full insurance may not be desirable as it distorts depositors’ incentives to differentiate between sound and unsound banks, creating moral hazard on banks’ side.⁴ Garcia (2000) recommends providing low coverage as a good practice but suggests that which deposits should be

³ Our emphasis on how quickly bank runs occur is motivated by the fact that in the majority of crises, at the earlier stages, the extent and the exact source of problems (idiosyncratic vs. system-wide, or liquidity vs. solvency) is usually not known to market participants and authorities due to the opaque nature of banks. Hence, the time horizon over which the crisis takes place is of prime importance since the market’s and the authority’s capability to sort out problems crucially depend on time on hand.

⁴ Some argue that guarantees actually make bank failures more likely. Demirguc-Kunt and Detragiache (2002) analyze panel data for 61 countries during 1980–1997 and conclude that “explicit deposit insurance tends to be detrimental to bank stability, the more so when institutional environment is weak, when the coverage is extensive and when the insurance is run by the government.” Hoggarth et al. (2005) show that the provision of safety nets reduces the overall ex-post impact of banking crises, but makes it more likely ex ante that the banking system will face a crisis. In particular, they show that countries with an explicit unlimited deposit protection scheme are the most likely ones to experience banking crises. They also show that the group least likely to experience a crisis is that with an explicit but *limited* deposit protection scheme.

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