Bank runs and investment decisions revisited [☆]

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Abstract

We examine how the possibility of a bank run affects the investment decisions made by a competitive bank. Cooper and Ross [1998. Bank runs: liquidity costs and investment distortions. Journal of Monetary Economics 41, 27–38] have shown that when the probability of a run is small, the bank will offer a contract that admits a bank-run equilibrium. We show that, in this case, the bank will chose to hold an amount of liquid reserves exactly equal to what withdrawal demand will be if a run does not occur; precautionary or "excess" liquidity will not be held. This result allows us to show that when the cost of liquidating investment early is high, an increase in the probability of a run will lead the bank to invest less. However, when liquidation costs are moderate, the level of investment is *increasing* in the probability of a run.
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1. Introduction

The direct consequences of a crisis in the banking system are fairly well understood and have been extensively documented (see, for example, Boyd et al., 2004). It seems likely, however, that the mere possibility of a banking crisis will also have important macroeconomic consequences, even if a crisis does not occur. For example, suppose it is believed that with some small but positive probability, all depositors will suddenly rush to their banks and attempt to withdraw their money. This possibility will almost certainly influence the level of cash reserves that a bank will choose to hold. One of the main roles of the banking system is to perform maturity transformation, that is, to hold long-term assets while issuing short-term liabilities. If the possibility of a crisis leads banks to hold a more liquid portfolio, it will reduce the funds available for long-term investment and thereby have a substantial impact on real economic activity. Such indirect effects of banking crises are less well understood, and are our focus in this paper. Specifically, we ask: how does the *possibility* of a bank run influence the investment decisions made by a competitive bank?

We build on the work of Cooper and Ross (1998), who first analyzed this issue in an extension of the classic Diamond and Dybvig (1983) model. Diamond and Dybvig set up an environment with idiosyncratic liquidity-preference shocks and private information. They showed that the process of providing liquidity insurance makes a bank illiquid, and thereby exposes it to the possibility of a bank run. However, the Diamond–Dybvig analysis leaves open an important question. Why would an agent deposit in a bank if she expected a run to occur? Cooper and Ross (1998) addressed this issue by introducing a sunspots-based equilibrium selection rule: if the banking contract is susceptible to a run, then a run will occur with some fixed probability q. They showed that under this rule agents will always choose to accept the contract offered by a competitive bank. If the probability q is high enough, this contract will be "run-proof." If q is small, however, the contract offered will be susceptible to a bank run and hence a run be part of a rational expectations equilibrium. With these results in hand, they attempt to characterize bank investment decisions in this environment. We revisit this issue and show that some of the conclusions they draw are incorrect. We then correct, clarify and extend their results.

Cooper and Ross (1998) emphasized the role of "excess liquidity," that is, liquid assets that the bank intends to hold over the long term, despite the fact that these assets yield a lower rate of return than illiquid investment. There are two reasons why a bank might choose to hold excess liquidity. First, having a highly liquid portfolio would minimize liquidation costs if a run were to occur. Second, if the bank decides to instead offer a run-proof contract, holding a highly liquid portfolio might provide the best possible run-proof consumption profile to depositors. Assuming preferences are of the constant-relative-risk-aversion variety, we show that—contrary to what Cooper and Ross (1998) suggest—a bank will *never* hold excess liquidity for the first reason. That is, if a bank offers a deposit contract that is not run-proof, it will hold only enough liquid assets to exactly meet withdrawal demand in the event that a run does not occur.

This result enables us to fully characterize the relationship between the probability of a run and the level of illiquid investment undertaken by a bank. At first glance, it seems like the nature of this relationship should be straightforward: the more likely is a run, the more likely it is that the bank will have to liquidate all of its investment and hence the less the bank should invest. However, we show that there is another, more subtle, effect at work. Our result on excess liquidity says that all liquid assets will be used to meet short-term