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Bank liquidity regulation and the lender of last resort

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ABSTRACT

Banks can make suboptimal liquidity choices and gamble for lender of last resort (LOLR) support. Endogenous bailout rents are driven by the need to preserve bankers' incentives under uncertain net worth. In equilibrium, banks can herd in risk management, choosing suboptimal liquidity when they expect others to do so. Optimal liquidity can be restored by quantitative requirements, but such regulation is costly. An LOLR policy incorporating bank capital information can reduce distorting rents and allow for a more efficient solution, but may only be possible in transparent economies.

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1. Introduction

Banks provide liquidity insurance by offering demandable deposits and underwriting credit lines to firms (Diamond and Dybvig, 1983; Kashyap et al., 2002). In doing so, they become exposed to liquidity risk. The concern is that a bank with positive capital may fail due to a liquidity shortage. To insure, banks maintain precautionary “liquidity buffers” of tradeable short-term assets, which can be converted into cash without loss at a short notice.

A bank unable to cover a liquidity shortage fails unless it is bailed out. Its central bank may be averse to providing a bailout in the form of Lender of Last Resort (LOLR) support due to monetary and incentive costs (Rochet and Tirole, 1996). Yet the intervention is unavoidable in a systemic crisis, when the survival of at least some banks is essential for real economic activity.¹ The possibility of LOLR

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¹ Otherwise, severe negative effects may include a payments gridlock or a credit crunch (Freixas et al., 2000; Bernanke and Gertler, 1989).

support creates rents for banks. Rents can distort banks' incentives to accumulate sufficient liquidity *ex ante* and make them gamble for LOLR support instead.

The purpose of this paper is to analyze the sources of bail out rents and examine the possibilities for policy response. In particular, we ask whether quantitative liquidity requirements are necessary, or whether under some conditions there may be other ways of reinstating optimal bank liquidity.

1.1. Liquidity regulation

There are two principal ways in which the regulator can intervene to assure socially optimal bank liquidity. The first, mechanical, is to impose quantitative requirements. However quantitative regulation of liquidity is costly (cf. Glaeser and Shleifer, 2001) because it may be difficult to define precisely the set of appropriate liquid assets.

As an alternative to quantitative regulation, a central bank may attempt to improve the LOLR process in order to reduce bailout rents and eliminate the fundamental distortion. There are two possibilities. The first is to prioritize LOLR support to banks that have made an *ex ante* socially optimal choice—were liquid. A credible *ex ante* commitment to support liquid banks would increase liquidity incentives. However this policy suffers from time inconsistency. Failures of liquid banks occur when their net worth becomes negative, leaving managers no incentives to operate the bank prudently. Therefore, *ex post*, offering LOLR support to illiquid but potentially positively capitalized banks (with a higher asset value) increases social welfare. Consequently, the policy of conditioning LOLR policy on banks' liquidity is likely unsustainable.

The second possibility is to reduce the *value* of LOLR rents. We show that rents are driven by uncertainty over bank's net worth.² If a central bank could use information on bank asset value in setting LOLR repayment terms and charge more to banks with high net worth, that would reduce the distorting rents and bring banks' liquidity choices close to the social optimum. However such policy is only feasible when a central bank has rather precise information on banks' capitalization, even in times of crisis. Arguably, this is only possible in sufficiently *transparent* financial systems.

We conjecture that regulators in financially developed countries are able to rely less on quantitative liquidity requirements, thanks to the possibility of less distortive LOLR interventions. This is consistent with the observation that liquidity requirements have generally become non-binding in advanced economies, such as the UK or US (Chaplin et al., 2000; Bennet and Peristiani, 2002). In contrast, developing countries, where information on banks' net worth is less readily available, have to (and in practice do) rely on quantitative liquidity regulation (Freedman and Click, 2006).

1.2. Modeling

In the center of this paper is a model of bank liquidity choices and systemic stability. We consider two banks that face a liquidity risk and choose whether to hold a precautionary buffer against it. Holding liquidity is costly, because a liquidity buffer facilitates managerial moral hazard if a bank becomes insolvent (cf. Myers and Rajan, 1998). Yet in the first best banks decide to be liquid in order to insure long-term charter value.

The distortion we consider is that in a systemic crisis, when both banks fail, the central bank has to bail out one of them to preserve systemic stability. Such intervention is associated with rents, which are driven by the need to preserve bankers' incentives under uncertain net worth. Banks may have assets of high or low value, and can switch to a moral hazard project if the value of bankers' equity stake is too low. If the central bank lacks individual asset value information, it has to set repayment so as to preserve incentives even for a low asset value bank. Generous repayment terms benefit high asset value banks. Banks therefore face a trade-off between a higher probability of preserving charter value (if liquid) and a higher probability of failing and receiving

² In this paper, we use the terms "net worth" and "bank capital" interchangeably, referring to the economic value of bank capital. In financial regulation, banks with positive capital are often referred to as "solvent," and those with negative capital—as "insolvent."

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