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Credit Policy in times of Financial Distress

Costas Azariadis [*]

Department of Economics, Washington University, United States
Federal Reserve Bank of St. Louis, United States

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ABSTRACT

This essay evaluates two central bank policy tools, capital requirements and lending of last resort, designed to avert financial panics in the context of endowment economies with complete markets and limited borrower commitment. Credit panics are self-fulfilling shocks to expected credit conditions which cause transitions from an optimal but fragile steady state to a suboptimal state with zero unsecured credit. The main findings are: (i) Countercyclical reserve policies protect the optimal equilibrium against modest shocks but are powerless against large shocks. (ii) If we ignore private information and central bank inefficiencies, this class of models bears out Bagehot's 1873 claim in *Lombard Street*: panics are averted if central banks stand ready to lend at a rate somewhat above the one associated with the optimal state.

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1. Introduction: issues, policies, literature

1.1. Issues

In the fall of 2008, the Great Recession brought financial crises out of the dustbin of history into front-page reality. Interest in panics, bubbles and manias suddenly escaped the confines of economic history[1] and obscure theory to become a ripe subject for commentators and op-ed writers.[2] Together with these developments came renewed academic interest in the causes, consequences of and cures for financial crises, a topic that researcher s had ignored since the 1930s.[3]

This essay seeks to evaluate the contribution of two central bank policy tools in managing financial crises. The tools reviewed, capital requirements (CR) and lending of last resort (LLR) have been in the arsenal of monetary authorities for a long time; the second one was deployed with success by the Bank of England as early as two centuries ago.[4]

The context for this evaluation is an endowment economy of the type studied by Kehoe and Levine (1993), Alvarez and Jermann (2000). As individual incomes fluctuate, heterogeneous households attempt to smooth consumption by lending and borrowing without commitment to repay loans.

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* Address: Department of Economics, Campus Box, 1208, Washington University, St. Louis, MO 63130-3629, United States. Tel.: +1 314 935 5639; fax: +1 314 935 4156.

E-mail address: azariadi@wustl.edu

[1] A good example is Bordo (1989).

[2] See, for example, Lewis (2011), Reinhart and Rogoff (2009).

[3] One exception is work on bank panics by Diamond and Dybvig (1983), Champ et al. (1996) and others. The recent revival of interest in bubbles and related phenomena is expressed in papers by Martin and Ventura (2012), Farhi and Tirole (2012), as well as in policy-driven contributions from Kiyotaki and Moore (2012) and others.

[4] For a brief history of LLR cf. Humphrey (2010).

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Loan default in this environment leads to perpetual exclusion from credit markets: it destroys the borrower's reputation and forever disqualifies her from asset trading. Lacking an external source of enforcement, loans are repaid only if repayment is in the borrower's interest, that is, only if gains from future trading in asset markets outweigh the immediate benefit of withholding repayment. All loans exchanged in the credit market must be self-enforcing, that is, they must be constrained by the requirement that the loss of trading privilege outweighs the short-run gain from default. To achieve this, lenders impose on each borrower a debt limit that depends on how much borrowers value their reputations.

Reputation itself is a non-fundamental feature of each household: it depends in part on the borrower's perception of future credit conditions. Borrowers who expect or require substantial future loans will value their reputations more highly than those who do not need or do not expect to obtain sizable loans in the future. This link between the value of reputation and expected credit conditions is called a *dynamic complementarity* which ties current lending to expectations of future lending. Pessimistic expectations of future credit availability will restrict current credit and compromise consumption smoothing; optimism has the opposite effect of facilitating consumption.

The outcome of all these constraints is that economies with limited commitment are capable of two long-run equilibria. One of them is a fragile bubble-like state with highly valued reputations, considerable unsecured lending and good welfare properties; the other is a robust no-bubble state with worthless reputations and no lending. The fragile state is a constrained optimum in which debt limits are forever the largest possible loans that borrowers are willing to repay. The robust state is the textbook outcome of *financial panics*; credit conditions are the worst possible and expected to remain so for the foreseeable future.

1.2. Policy tools

Managing financial crises in this context means to deploy the tools at the disposal of the central bank in a manner that improves household expectations about future credit conditions. If policymakers convince borrowers that reasonable amounts of credit will be available in the future, current lending will pick up, and financial crises will heal or, in the best of circumstances, be nipped in the bud.[5]

Policies to contain or avert panics are most prominently connected with Thornton (1802) and Bagehot (1873). The former was concerned about reductions in credit triggered by rumors of invasion, bank failure, etc.; the latter advocated that the Bank of England should prevent shrinkage in broadly defined "money" by committing to lend at a high interest rate to creditworthy borrowers offering good collateral.

> "Very large loans at very high rates are the best remedy of the money market when a foreign drain is added to a domestic drain."[6]

In the remainder of this essay we examine the role of CR and LLR policy rules as devices that select desirable equilibria and avert financial panics in environments where limited commitment is the only financial friction emanating from the private sector.[7] We ignore financial frictions that arise from private information or incomplete markets, e.g., moral hazard, adverse selection and liquidity shortages. These are adequately treated in the literature referred to in footnote 3 and in more recent extensions by Martin (2006), Ennis and Keister (2010) and others.

Capital reserves and lending of last resort are viewed in what follows as instruments that manipulate the economy's available consumption resources in a manner that raises aggregate consumption when private loans are large, and lowers consumption when lenders pull back. Central bank policies derive their power from two sources. One is the government's ability to extract from households a small fraction of their income in a way that private lenders cannot. The central bank in effect can "collateralize" part of each borrower's income. In addition, the central bank's payoff is assumed to be social welfare which implies that policymakers will choose to repay all loans and abstain from acts damaging to households.

Against these advantages, we will build into policy three limitations that make the central bank inferior to private institutions as a financial intermediary. One, the central bank invests reserves of private capital in an inferior storage technology whose return is so low that no private investor would make any use of it. Two, when the central bank converts private deposits into loans, an exogenous fraction $\delta \in [0,1]$ of deposits is wasted in income-destroying "leakages". Three, the central bank cannot completely exclude renegade borrowers from credit markets; it can prevent them from ever borrowing again but cannot keep them from lending. The outcome is that the central bank is able to keep the credit spigot always open but is unable to punish credit mischief as resolutely as private lenders will in good times. To avoid a flood of defaulters and the heavy losses that come from non-performing loans, *the central bank will have to lend less than private intermediaries would under ideal conditions.*

Section 2 lays out the basic model of financial fragility and credit crises in laissez-faire environments. CR policies are evaluated in Section 3 and LLR policies in Section 4. The last section sums up and discusses extensions.

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[5] Bordo (1989) lists 16 episodes of bank runs or failures over the period 1870–1933 and 30 crisis events (panics, crashes, failures). Timely action by the Bank of England seems to have defused crises in 1878/1898 and 1941; the Bank of France intervened successfully to prevent declines in money growth in 1882, 1898 and 1930.

[6] Bagehot (1873), *Lombard Street*, p. 56. Also see Rochet and Vives (2004) for a modern view on LLR.

[7] Antinolfi et al. (2007) is an early example of managing credit crises by monetary feedback rules that connect liquidity injections with the state of the credit market. The basic model presented in Section 2 is the same as in the AAB paper.

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