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Perotti, E.; Suarez, J.

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The Simple Analytics of Systemic Liquidity Risk Regulation

Enrico Perotti and Javier Suarez*

The recent crisis has provided a clear rationale for the regulation of refinancing risk, a critical gap in the Basel II framework.

The current Basel III liquidity proposals rely on quantity-based requirements to contain liquidity risk as a risk externality. They take the form of larger liquidity buffers and fixed limits to the size of unstable funding. But tight fixed ratios are seen by industry as very expensive, and they are likely to be significantly watered down. In the absence of other tools, the task of containing systemic liquidity risk would remain unfulfilled.

Short-term funding has also advantages, as it can support rapid expansion of credit over GDP (for instance, because insured deposit supply expands slowly, or because short term lenders do not need to become informed about bank credit risk. However, given its limited commitment, short term funding creates refinancing risk. Sudden withdrawals may lead to disruptive liquidity runs (Diamond and Dybvig, 1983), and cause fire sales which spread losses, or trigger counterparty risk externalities for exposed intermediaries (Brunnermeier, 2009; Allen, Babus and Carletti, 2010). Each bank's funding decision has an impact on the vulnerability of asset prices to liquidity runs. So even if individual banks take into account own exposure, they will not internalize its contribution to system-wide cost (Perotti and Suarez, 2009), a classic externality. The wedge between the net private value and the social cost of short-term funding ensures that banks rely excessively on short-term funding.

A recent example is the massive build up in wholesale funding ahead of the crisis. Overnight (repo) secured credit feeding the final stage of the securitization wave grew explosively during 2002-2007 to a volume over ten trillion dollars (Gorton, 2009). Rapid withdrawals forced an unprecedented liquidity support by central banks, undermining their control over the money supply. The need to contain future accumulation of liquidity is thus a core challenge for macroprudential policy.

In the tradition of externality regulation led by Weitzman (1974), in a new CEPR discussion paper, Perotti and Suarez (2011) assess the performance of Pigovian taxes (aimed at equating private and social liquidity costs) and quantity-based regulations in containing this systemic externality. As in Weitzman, the optimal regulatory tool depends on the response elasticity of

* University of Amsterdam & Duisenberg school of finance and CEMFI respectively.

banks, recognizing that the regulator is informationally constrained in targeting individual bank characteristics.[1]

Our results show how the industry response to regulation depends on the composition of bank characteristics, as banks differ in their credit ability and their incentives to take risk. Banks earn decreasing returns to expand credit to their (monitored) borrowers, so better banks naturally wish to lend more. Shareholders of less capitalized banks gain from investing in poor gambles, since they retain the upside and shift downside risk to the public safety net (or alternatively because they are run by self-interested and overconfident managers, which view excessive risks as profitable). We find that depending on the dominant source of heterogeneity, the socially efficient solution may be attained with Pigovian taxes, quantity regulations or a combination of both.

Bank variation in credit quality

When banks differ only in capacity to lend profitably (reflecting credit assessment capability or access to credit opportunities), a simple flat-rate Pigovian tax on short-term funding (possibly scaled up by the systemic importance of each bank, e.g. to capture contribution to counterparty risk) implements the efficient allocation. The intuition is that liquidity risk levies allow better banks to lend more, without requiring the regulators to be able to identify them. In this context, a quantity approach such as a *net stable funding ratio* or a *liquidity coverage ratio* (such as those proposed by the Basel Committee on Banking Supervision in December 2009) would be highly distortionary, reallocating credit away from banks with good lending opportunities.

Net stable funding ratios which impose an upper limit on short-term debt do reduce overall liquidity risk, but redistribute liquidity risk inefficiently across banks. Banks with better credit opportunities will be constrained, while the reduced systemic risk actually encourages banks with low credit ability (for whom the requirement is not binding) to expand.

Buffers are either ineffective or procyclical

Liquidity coverage ratios which require banks to hold fractional reserves of liquid assets against short-term funding work as a de facto tax, but with poor incentive effects. In boom times, the yield on liquid assets equals the cost of short-term liabilities, as it was the case prior to the crisis. In this stage, buffers impose no cost on carrying liquidity. So banks will simply increase their gross short-term funding, so that their net short-term funding are as high as in the

[1] The approach is also related to the classical discussion by Poole (1970) on the optimality of price or quantity monetary policy instruments when the system to regulate is affected by several types of shocks.

unregulated equilibrium. The only effect is an artificial bank demand for liquid assets—traditionally kept in money market mutual funds rather than banks.

When the spread between liquid asset yields and bank borrowing costs is positive, a liquidity requirement operates as a tax on short-term funding, but the effective tax rate will be market determined—the tax rate will equal the product of the buffer requirement per unit of short-term funding times the interest spread. In the recent experience, interbank spreads over safe assets has been minimal just as aggregate liquidity risk was building up, while it escalated once the crisis started. Unless buffers are adjusted frequently, they would contribute to procyclical effects, relaxing the opportunity cost of unstable funding in good times and increasing it after a shock.

Bank variation in solvency incentives

Bankd do not vary only on credit quality, but also in solvency incentives. These reflect capitalization and charter value, or behavioral determinant of risk-taking, such as overconfidence). This case qualifies the results radically. Low charter value (or more risk loving) banks have incentives to gamble to shift risk to deposit insurance and other forms of support (Keeley, 1990).

We show that when bank decisions are overwhelmingly driven by gambling incentives, banks are not properly deterred by levies, while quantity constrains are more effective. Both short-term funding limits (e.g. a net stable funding ratio) and capital requirements can contain risk shifting by limiting the scale of lending. Levies will not be very effective because the most gambling-inclined banks will also be the most inclined to pay the tax and expand their risky lending. In this case, quantity instruments such as net funding or capital ratios are best to contain excess credit expansion.

Both quantity limits and liquidity charges

Our analysis on the relative merits of price versus quantity instruments suggests that combining them may be adequate for the simultaneous control of gambling incentives and systemic risk externalities. However, this presumes that the regulator controls can only act on regulatory tools related to liquidity risk. If strengthening capital requirements is an effective strategy for the control of gambling incentives (e.g. Hellmann, Murdock, and Stiglitz, 2000), the case for regulating liquidity risk with levies on short-term funding is considerably reinforced.

The approach allows to identify recommendations for the use of ratio and charges. For instance, levies may be less costly to adjust than ratios. They might be easier to change, as in the likely case that regulatory ratios are embedded in an international agreement while levies are under control of a macroprudential authority. More importantly, they would impose lower adjustment costs than changing funding volumes on short notice.

Similarly, changes in levies are less likely to induce procyclicality than buffers, since the effect of a Pigovian charge is more directly controlled by the regulator rather than being set by the interaction of a (controlled) quantitative requirement and the (freely fluctuating) market price of the rationed quantity.

For preventive purpose, controlling time varying liquidity risk may be best achieved by a combination of some (variable) levies aimed to control the generation of risk externality by normal banks, while ratios may be aimed at containing the risk-appetite of gambling banks.

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