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Liquidity Risk Charges as a Primary Macroprudential Tool

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Last February we proposed a new macro prudential tool, *liquidity risk charges*, to discourage liquidity risk creation by banks. The proposal was updated in November after extensive feedback from academics and policymakers. We offer here a full review of the proposal.

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I. Systemic risk and its prevention

Systemic risk is best defined as propagation or contagion risk, when financial shocks are propagated beyond their direct financial impact to other markets or intermediaries, transmitted throughout the financial system via distress or generalized price drops, and resulting in widespread economic disruption.

The recent financial crisis was unprecedented in scale and speed of propagation. The original sub prime mortgage lending shock, large but hardly systemic, was severely compounded by the extreme funding fragility built up by banks (Brunnermeier, 2009), largely as a result of the process of securitization. As a result of reckless regulatory arbitrage, bank risk absorbing capacity had been reduced by lower capital buffers and extreme short term funding of long term assets in the banking and shadow banking system. Once losses became visible, panic withdrawals by wholesale short term investors (Gorton, 2009) led to sudden deleveraging just as margin requirements were sharply raised.

The resulting need to liquidate assets at any cost in a rush propagated losses, as it forced massive distress sales across markets.¹ Rapid asset price declines triggered further margin calls and thus more fire sales and distress. The resulting uncertainty undermined market refinancing even after massive liquidity support, and was finally resolved only by system wide state guarantees. The build up of such fragility reflected strong private incentives to take on long term risky assets on a large scale without absorbing the risk with adequately long dated or stable liabilities, such as equity or insured deposits. These incentives were reinforced by a long period of abundant liquidity and very low short term rates. The crisis has led to a consensus on the need to address systemic liquidity risk, given its critical role in propagating a crisis.

¹ Panic was reinforced by a sudden shift in risk perception on opaquely packaged assets, also a by product of regulatory arbitrage.

In February 2009 we proposed a new macroprudential tool, *liquidity risk charges*, to discourage liquidity risk creation by banks (Perotti and Suarez, 2009a). The final revised proposal was published in November (Perotti and Suarez, 2009b).

Liquidity charges target refinancing risk, so they need to be complemented by other reforms, such as capital requirements, aimed at asset risk. The mandatory charge would be paid continuously by all intermediaries potentially covered by liquidity and financial support by the authorities in a systemic liquidity crisis. The charge would target short term uninsured liabilities, with weights decreasing in their contingent maturity. The goal is not to provide funding for rescues, nor do they represent insurance premia, although they would secondarily address both issues. The main objective of the charges is to improve incentives, as they would induce the intermediaries to internalize the social costs (propagation risk with its associated economic costs) into their private cost functions, affecting their funding maturity decision. The charges would thus discourage bank strategies that create systemic risk for everyone, just as Pigouvian taxes on pollution.

The ultimate purpose is to avoid excessive risk taking and to challenge reckless expansion of credit funded with short term wholesale money. The charges would be adjusted in a preventive fashion to affect the marginal cost of speculative carry trade strategies, and send strong signals on financial stability policy without requiring a generalized increase in interest rates which would hurt the general economy. This would enable macroprudential policy to be in part independent of monetary policy, although its implementation could still be seen as the natural task of the central bank.

We reproduce here this final proposal, which addresses extensive commentary we have received, answers frequently asked questions and offers some implementation details. In the appendix we sketch a simplified implementation scheme.

II. Our proposal in a nutshell

Our proposal aims at correcting the *negative externalities* caused by banks' excessive reliance on short-term, "uninsured" funding. It acknowledges that central banks and governments will be forced during a systemic crisis to provide significant *liquidity insurance* even for nominally uninsured funding.² This de facto insurance calls for a system of liquidity risk charges (in brief, LRCs). These charges would be essentially Pigouvian, aimed at making banks internalize the negative systemic effects of fragile funding strategies.³ The goal is to prevent excess reliance on short-term funding in good times. As taxes they would complement deposit insurance charges, without creating any explicit commitment to liquidity support.⁴

As a principle, an unit of short term funding should be taxed in proportion to its marginal contribution to a bank's contribution to systemic vulnerability. A general approach would estimate the systemic contribution of more bank characteristics (Adrian and Brunnermeier, 2009), a challenging task.⁵ Our simpler approach is to levy charges on banks' short maturity funding, a simple yet critical proxy for propagation risk.

The formula for total charges to bank j in period t would be of the form:

$$\text{LRC}_{jt} = c(z_{jt}) \sum_{s=1 \dots S} w(s)x(s)_{jt}, \quad (1)$$

where

² We state this as an observation rather than a normative suggestion. A normative defense of insurance can be found in Caballero (2009), among others.

³ The need for a Pigouvian approach to target negative externalities in financial regulation has also been stressed by Acharya et al (2009) and Brunnermeier et al (2009).

⁴ In their absence there is a fiscal incentive to disintermediate deposit taking via the shadow banking system, such as (nominally uninsured) money market funds.

⁵ Serious measurement issues are the reliance on market data and the scarcity of relevant data during crisis periods, since contingent correlations become revealed only during systemic events. An additional challenge is that correlation may not fully reflect causation.

$x(s)_{jt}$ are bank liabilities with maturity of s days,
 $w(s)$ is the refinancing-risk weight for maturity s , with $w(1)=1$, $w(S)=0$,
 S is a sufficiently large maturity to be considered safe (e.g. one year),
 $c(z_{jt})$ is the charge per unit of refinancing-risk-weighted liabilities,
 z_{jt} , is a vector of additional factors (such as size and interconnectedness).

The weighting function $w(s)$ would be decreasing in s and, and be smooth so as to avoid regulatory arbitrage which may distort market rates. The fraction of funding coming from own capital or insured retail deposits would be exempt from charges (i.e. it would be assigned maturity S). In addition, the taxable base should be scaled down by holdings in assets which remain liquid during systemic crisis, such as government bills and central bank deposits, and augmented by contingent liquidity commitments, such as the stock of callable credit lines.

Charges should be paid at high frequency (say weekly, at most monthly), requiring a large scale but straightforward data collection on maturity structure. Assigning a maturity to a liability is less obvious in the case of contingent liabilities. Here setting a measure robust to manipulation calls for using contingent maturity, namely the shortest possible withdrawal date (as in the worse case scenario). This is consistent with the goal to measure the speed at which liquidity will be withdrawn in a systemic crisis.

The per-unit charge $c(z_{jt})$, as well as the minimum maturity S above which charges are zero, are the key fine-tuning instruments. To start with, it would be reasonable to impose a low experimental flat charge, e.g. in the range of 0.001-0.003 per annum, which would entail a penalization of short term funding of 10-30 basis points per year. Even such charges might significantly tilt banks' funding strategies towards longer maturities, without fully constraining the resort to short-term financing whenever valuable. We think this price effect compares favorably with the rigid effect of minimum liquidity ratios.

Charges should be stable, but adjustable (within some limits) by the macroprudential authority in response to aggregate risk accumulation, such as asset price bubbles based on fragile funding,⁶ and broader systemic stability goals. Policy tightening may be achieved by a parallel increase in the structure of the per-unit charges $c(z_{jt})$, by a further penalization of very short maturities (e.g. by attributing higher $w(s)$ to lower s), or by introducing surcharges for further increases in exposure. Adjustments might be non-retroactive to differentiate between marginal charges (on new funding) versus historical average charges. As initially proposed, the new instrument addresses solely funding risk. It is meant to be complementary to other reforms, primarily higher, countercyclical capital requirements.⁷

⁶ Only asset bubbles directly affecting the bank sector need to be a concern in terms of fragile funding. For instance, internet stocks were funded with equity and their demise, however massive, did not result in financial instability nor spread to other markets.

⁷ Important reforms which might be combined with the new instrument are private capital insurance, and regulations limiting or discouraging the holdings of other banks' long-term debts or CDS exposures, and the holdings of nonstandard securities.

III. Discussion

1) Why charge banks for liquidity insurance if ex post liquidity support is costless and efficient?

Ex post liquidity support is not ex post costless if many banks are not just illiquid but insolvent. If insolvent banks cannot be identified (or it is not credible not to bail them out) then liquidity supports subsidize the least efficient. In this case it is also ex ante costly as it encourages more risk creation. For instance, it enables banks with less capacity to assess risk to raise cheap funding to overextend their lending, which in turn increases the chance of liquidity runs. Liquidity runs cause economic disruption, as they disrupt planning and business confidence, increase risk perception or decrease the volume of intermediated savings.

2) Why are liquidity risk charges based on mismatch better than capital requirements indexed to mismatch?

We premise that capital requirements and liquidity charges are complementary, as the first targets asset risk and the second liability risk.

If capital ratios were also based on mismatch, they would produce similar incentives to liquidity risk charges. However, capital requirements are not generally considered the best tool to regulate liquidity risk.

- a) As a buffer against liquidity runs, capital ratios would need to be very high, even though the need is for contingent liquidity (and capital) upon runs.
- b) It is much harder and costlier to adjust capital levels and rules than funding structure. Policy adjustments during vulnerable times would be difficult. Moreover, the minimum capital ratios, as all quantity regulation, would create triggers. In a liquidity crisis many banks would be forced to raise capital at the same time.

- c) The “pre-payment for likely support” associated with liquidity risk charges would reduce the political cost of supporting the banks during systemic crises, improving the social perception of legitimacy for the use of government funds in case of need. Capital requirements would not have this effect.

3) Should charges be accumulated in a fund?

Not necessarily, but doing it would reinforce the credibility of the arrangement, and facilitate politically the coverage of costs in case of a crisis. It could also facilitate coordination in a multi-country context. If no fund is created, the liquidity risk charges accrue as general revenue to the treasuries involved in the arrangement (say, in proportion to the contributions made by the banks domiciled in each national jurisdiction).

A fund involves prefunded burden sharing, which enables to cover losses associated with liquidity assistance, ensures cooperation, and avoids conflictive ex post discussions on burden sharing among treasuries.

4) If a fund is created, where should the funds be invested?

As a reserve against systemic events, they should be held in assets which maintain their value in a systemic crisis, so central bank reserves and government bonds seem a natural choice.

5) If a fund is created, should it be managed by the macroprudential authority, the central bank, the treasury or an ad hoc agency?

The critical question is where losses due to systemic liquidity crisis are borne. Assigning funds to the liquidity providers would cushion any losses from liquidity support. On the other hand, the independence of the central bank may come under pressure. Funds could be located at the treasury, provided it would explicitly guarantee central bank solvency in case of liquidity support.

6) Other factors, such as intermediary size and their interconnectedness, also contribute to systemic risk creation. Why base charges only on funding fragility?

Charging for funding fragility has a sound theoretical basis in the balance sheet channel of propagation. There is consensus that rapid withdrawals cause fire sales and the spread of trouble across markets. Fundamentally, whatever the initial shock may be, any systemic crisis involves liquidity runs. Reducing the speed of potential withdrawals increases the resilience of the system to panic.

We propose to immediately introduce charges based on funding fragility, and scale them by a set of easy-to-measure factors, such as intermediary size and interconnectedness. Over time, the precise impact of these factors will be refined as advances in this area of research provide us with better proxies.

Insisting to start with a broad set indicators has measurement and interpretation risk. Measuring individual contributions to systemic risk requires computing contingent correlations using data from periods of distress, for which there is little data. It is also hard to convincingly measure all factors which cause propagation, rather than being correlated with it. A conceptually more precise measure may be quite controversial and require a long dialogue with industry, with serious risks of excess delay or capture.

7) The main challenge for any tool to stop speculative risk creation is political. How to ensure decisive action in good time?

If the risk of capture is severe, there are advantages to establishing liquidity risk charges based on very simple rules so as to be robust to manipulation, and defined by an independent macroprudential regulator isolated from industry lobbying.

To ensure maximum independence central banks should take a leading role in macro prudential supervision, irrespectively of whether they have similar micro prudential tasks.

Endowing the macro prudential authority with very few and specific tools would allow to introduce the principle of “use or explain”. Failure to intervene could not be excused with a lack of adequate instruments or their complexity. Public transparency of the tool would ensure its public credibility and accountability.

8) Why are liquidity risk charges better than minimum liquidity requirements or caps to short term funding? Why correcting the externality through *prices* rather than *quantities* ?

A combination may be ideal. However, minimum liquidity requirements do not fully prevent panics and involve an inefficient stocking of unproductive assets in normal times.

Just as tariffs relative to quotas, regulated prices are less distortionary and easier to adjust than mandated quantities. An important consideration is that liquidity ratios are likely to be breached simultaneously by all banks when confidence ebbs, acting as triggers for further liquidity runs by banks themselves in the approach to a crisis.

9) Should banks holding more liquid (and transparent) assets have lower charges?

In principle, assets which are liquid in a systemic crisis, basically reserves at central banks and high-quality government bonds, can be sold without causing fire-sale losses, so these assets might be subtracted from the measure of refinancing-risk weighted liabilities (producing a measure of refinancing-risk weighted *net* liabilities). However, this seems to be the sole category of assets to credit for, in order to avoid regulatory arbitrage.

10) Why should we charge for maturity mismatch? Is maturity transformation not the natural tasks of banks?

Yes. Deposit insurance is aimed at bridging the propensity of household to hold liquid assets with the medium term needs of productive financing. In our proposal, the funding coming from insured retail deposits is exempt from charges. But there is no clear social welfare case for promoting wholesale funding flows that are able to jump the queue in any run via electronic or phone withdrawals. Large investors in banks should absorb some risk or its social cost. The de facto insurance they enjoy in systemic crises should be charged in analogy with deposit insurance, although without creating a similar contractual claim to liquidity insurance.

11) Are your proposed charges a kind of Tobin tax?

We do not penalize financial transactions per se. As excessive reliance on short-term financing contributes to systemic instability, we propose to tax the negative externalities it causes by a Pigouvian tax, as in the case of pollution taxes.

12) Would charges shift liquidity risk creation to the shadow banking sector?

The application of the charges should be extended to all intermediaries deemed susceptible to require public liquidity and financial support in a crisis. In any case, the recent experience suggests that the shadow banking system relies critically on contingent liquidity support by the traditional (non-shadow) banking sector. Provided all contingent liabilities to non bank intermediaries be charged properly, risk creation will remain under direct control of the authorities.

13) How would charges be set, and how to ensure they are set at reasonable rates?

The intent is to start with low charges (see above) and adjust them to achieve a desirable funding structure. A tight benchmark would set them equal to the difference between the overnight and the rate on the “desired” minimum maturity. As in the case of monetary policy, controlling “prices” will be more effective than controlling quantities.

Banks would not be overtaxed if average charges were low but any additional increase in mismatch would face surcharges. Policymakers could adjust surcharges to respond preventively to time varying market conditions.

14) Do authorities need to declare a systemic liquidity event to trigger the provision of liquidity insurance?

A formal "activation" of any arrangement for systemic events may create risks on its own. Relative to our February 2009 proposal, we no longer need a formal trigger, as our proposal no longer includes capital insurance. The macro prudential authorities would retain discretion as to the amount and possible beneficiaries of liquidity support. The experience of the current crisis does suggest that in some circumstances the authorities should be ready to act much more aggressively and broadly than under conventional lending of last resort principles.

15) How different is your proposal from capital insurance?

We concur that resolution regimes which activate "private contingent capital" for individual banks, via automatic or supervisory-triggered conversion of long-term debt into equity would be a most desirable option (Kashyap et al, 2008). We do not believe that the private provision of liquidity or capital insurance would be sufficient to deal with systemic risk.⁸

It is not clear that market-based premia properly correct the underlying externalities. First, market prices might not fully discount systemic risk because of overconfidence, asymmetric information, and manipulation that can persist due to short term horizons and the low frequency of crises. Second, private insurance policies are likely be mispriced if their providers may go bankrupt or end up receiving public support during a systemic crisis. In this case, market premia would not sufficiently reflect systemic risk.

⁸ In this context liquidity insurance will work as some of the protections obtained by corporations under bankruptcy law (e.g. Chapter 11 in the US), buying time for proper reorganization.

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Appendix: A Proposal to Assess the Fiscal Implications of Liquidity Charges in the Netherlands

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This is a simplified proposal to assess the fiscal revenues which may be raised by the imposition of liquidity risk charges on financial intermediaries, along the line of the Perotti-Suarez (2009b) proposal. This requires a comprehensive but straightforward data collection on liability maturity structure of Dutch intermediaries.

Coverage

Liquidity risk charge should be applied to all intermediaries subject to emergency support by the ECB, DNB or the Dutch Ministry of Finance. A first measurement would include Dutch banks and money market mutual funds.

Computation of revenues

Charges would be based on a refinancing risk measure, computed as a weighted average of funding maturity, with decreasing weights. Insured deposits are excluded.

Tax rate and frequency

A starting assumption would be a tax rate ranging from 20 to 40 basis point on an annualized basis. Different scenarios can be examined. Charges assumed to be paid at high frequency (say monthly).

Calibration

To compute the impact of the factors z_{jt} , a first approximation would be to scale up charges according to a simple classification of intermediaries as large and systemic (e.g. scaled by a factor 1), medium but relevant (e.g. by a factor $\frac{3}{4}$), and small (e.g. a factor of $\frac{1}{2}$).

A simple continuous weighting scheme could be of the form $w(s)=(S-s)/S$. In this case, with $S=365$ and the above mentioned per-unit charges, a large systemic bank will face charges of 20-40 bp for overnight liabilities, 18-36 bp for those maturing in one month, 15-30 bp for those maturing in three months, 10-20 for those maturing in six months and 5-10 for those maturing in nine months.

An even simpler discrete formulation would assign a weight of 1 for up to one week, $\frac{2}{3}$ up to two months, $\frac{1}{2}$ up to six months, presuming that six months is a good measure of S , the *deemed-to-be-safe* maturity. In this last scenario, the charge for liquidity risk at a large systemic bank would range between 20 and 40 bp for liabilities up to seven days, 14 to 27 bp for liabilities up to 60 days, and 10 to 20 bp up to 180 days. At a medium bank the charges would be $\frac{3}{4}$ as large, and at a small bank half as large. This weighting scheme uses a non linear decay in remaining maturity, so as to penalize relatively more those at the low end.