

Seminar 10

1.

The central banks' 'central bank' – the Bank of International Settlements (BIS) – has released a set of 'rules' for commercial banks to follow, known as the Basel Accords – Basel I (1988), Basel II (2004), and Basel III (in implementation). These regulation agreements – especially Basel I – has focused on micro-prudential regulation, that is bank level regulation which are intended to make each individual bank safer by e.g. imposing capital requirements.

«It is a truism that ensuring the soundness of each individual institution ensures the soundness of the system as a whole. However, the proposition is vulnerable to the fallacy of composition. It is possible that, indeed often likely, that attempts by individual institutions to remain solvent can push the system into collapse.» (Geneva Report) In other words, actions that banks take to make themselves safer can (in times of crisis) undermine the system's stability. Because financial contagion in a modern, market-based financial system is based on individual banks' reactions to price changes, and shifts in measured risk, e.g. an asset price fall can weaken a bank's (marked-to-market balance sheet (B/S), thereby forcing the bank to reduce its B/S size (for instance by (fire-) selling assets or reduce its lending), which in turn can (in the face of low funding or market liquidity) lead to further asset price declines and weaker B/S, thus setting off a loss spiral (and vice versa in a boom, hence illustrating the pro-cyclicality). In this way, one bank's individual actions can lead to contagion and instability of the financial system.

«One immediate implication of this is that the standard format of banking stress tests is fundamentally insufficient. These stress tests review the effect on each bank's profits and capital of some (historically-based) exogenous shock. But, if financial crises are primarily caused by endogenous risk, whereby the banks' reactions to such a trigger sets off an amplifying spiral, via declines in asset prices and reductions in credit expansion, such stress tests, focusing on exogenous risk, will miss out on the (more important) second, and higher, round effects.» (Geneva Report)

Hence, due to the interconnectedness between banks and financial institutions (i.e. that they fail to internalize the effect they by themselves have on other banks; i.e. the 'social cost'), the current philosophy of banking regulation – that you can make the system safe by making individual institutions safe – is an unsatisfactory basis for insuring systemic stability. One way to overcome this problem is to supplement micro-prudential regulation with macro-prudential regulation, that is system-wide regulation, which focuses on e.g. risk-spillover effects.

2.

Funding liquidity – Reflects how easy it is to raise money.

Market liquidity – Reflects how easy it is to raise money by selling assets.

As banks typically have an asset-liability mismatch due to maturity transformation (i.e. lend short, borrow long) they are exposed to funding liquidity risk. To illustrate the importance of the liability side of banks' B/S position consider two banks, Bank 1 and Bank 2. Bank 1 has borrowed from Bank 2. Bank 2 in turn has, naturally, lent to Bank 1, in addition to holding other assets. Bank 1's loans is thus a liability for Bank 2 (i.e. it's a claim on Bank 2's asset side), and an asset for Bank 1 (as it has an obligation on Bank 2's liability side). Now, if bank 2 suffers credit losses on its other assets, implying that its equity is reduced, it must reduce its asset side in order to reduce its leverage ratio (debt to equity). One way to reduce the asset side (and hence its risk position) is to reduce overall lending. Bank 1 might see this action as a withdrawal of funding. And in the case of low funding liquidity – that is, it is difficult for Bank 1 to find alternative sources of funding – it, too, must reduce its asset holdings; either by depress lending, or by selling assets. This could eventually lead to low market liquidity as

banks try to sell off their assets, indicating that prices fall and banks will have to sell off more assets in order to raise adequate amounts of liquidity. This would then worsen banks' B/S position even more, leading to an additional round of asset price decline due to banks selling off assets in their pursuit to adjust leverage (back to a 'normal' level). These feedback effects, and the pro-cyclical leverage, thus sets off a vicious loss spiral. The loss spiral can be very sensitive to (sudden) price changes on assets for banks which have B/S marked-to-market. Hence, we have seen that both a funding liquidity – liability side effect – and market liquidity (loss spiral) – asset side effect – can have contagious impact within the banking system.

There is one additional amplifying mechanism at work here which reinforces the loss spiral: margin/haircut spiral. As banks finance their operations with debt – they are leveraged institutions – banks experiencing a marked-to-market loss of \$1 must reduce its position by $\$(1 \times LR)$, where LR defines the banks' leverage ratio. As asset prices are reduced, margins increase which lead to a general tightening of lending. This in turn, forces de-leveraging and more sales, which increase margins further, hence setting off yet another vicious spiral.

Combining the loss and margin/haircut spiral, we see that as asset prices drop, risk measures such as VaR (value-at-risk) increase, which increase the margins and external funding costs, but also reduce the risk-appetite within banks. This then calls for further de-leveraging – more asset fire-sales, higher margins – setting the spiral off. So, in this way, it is seen that «liquidity disappears down a black hole.»

The critical point here is to note that each bank acts prudently in its own regard (by trying to reduce leverage as equity is reduced), but the adverse effects are amplified through the effects these actions have on the system. This stems from the fact that each individual bank fails to internalize the effect its own actions have on the system.

3.

One example of a macro-prudential policy measure is counter-cyclical capital regulation. Counter-cyclical regulation regulates individual banks on the basis of the risk the systemic risk rather than the individual risk. This means that highly levered institutions would be subject to higher capital requirements than the rest, simply because it has potentially huge spillover effects on others. When there is increasing systemic risk, with increasing leverage, maturity mismatch, credit expansion, and asset price increases, the multiplication factor would be greater than unity. Counter-cyclical capital requirements therefore means that in times with higher credit growth, the capital requirement is higher, and institutions with higher systemic risk are subject to higher capital requirements.

Therefore counter-cyclical capital requirements can be an effective instrument against contagious impact within the banking system, and ease the effect of a bursting bubble. Highly levered banking institutions which are highly correlated with the systemic risk will be required to have a higher capital buffer in case of rainy days. This will lower the systemic risk since the regulation taking into account the macro-risk an institution represents, not only the individual risk. Institutions that could cause a great risk to the whole banking system will be regulated tougher, and these institutions will take less risk and therefore be less of a threat to the system.

The problem with absolute capital requirements that are uncorrelated with the credit growth is that it is pro-cyclical. For instance, a 2 percent capital requirement will be quite easy to overcome in good times, but will have a contracting effect in bad times. Regulation where the banks must hold a higher capital requirement in times with high credit growth will solve this. This stops the banks from participating in the making of the credit growth and holding loans back in times with low credit growth. It will also lower the maximum leverage in the interbank sector, and make it easier not to

default the loans in the interbank market in times of crises. A counter-cyclical capital requirement will therefore also make the problem of contagious impact within the banking system smaller.