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Question: How has LCR affected liquidity creation by banks?

- Measure liquidity creation using Liquidity Mismatch Index (LMI) of Bai et al (forthcoming).
  - LMI = Asset Liquidity - Liability Liquidity
  - Smaller values of LMI indicate more liquidity creation
Changes in Loan Portfolios?

Different types of loans in the aggregate portfolio of the affected banks, 2012Q4

- LMI assigns same liquidity to all loans.
- Does not matter much in Bai et al: results driven by liabilities.
- Can you tell us more about changes in loan composition?
How should we think about non-constant returns to scale in liquidity creation and differential growth opportunities?

- Parallel trends before treatment?

Since liquidity creation is rewarded with higher multiples (Berger and Bouwman 2009, Egan et al 2016), can you look at the change in multiples for different banks?

**Questions**

1. How do banks optimally liquidate their portfolios when forced to sell?
2. What is the role of different regulatory constraints?

**Approach**

- Model of bank balance sheets subject to regulatory constraints.
- Calibrate using detailed supervisory data on 7 UK banks.

Lesson 1: Liquid Assets Must Be Usable Under Stress

Figure 6: fire-sale losses for deposit outflow scenarios

Figure 7 shows that for 20% initial outflows, only a few banks are forced to sell assets and they choose to sell highly liquid assets to minimise the losses they incur from their sales. Moreover, the average market depth of the assets that banks sell is more than twice as high as the average market depth of their marketable assets portfolio, denoted by the blue dashed line. However, as shocks become larger, banks exhaust their holdings of highly liquid assets and are forced to also monetize less liquid assets. The large sale of assets that occurs below average market depth in the large outflow scenario is due to banks splitting into two sets: one set of banks has relatively more liquid holdings than the other set, and the set of banks with relatively less liquid holdings is forced to sell more assets because it has less buffer towards its LCR constraint. In the large outflow scenario banks hold around 35% of their total tradable assets. Overall this generates additional losses of up to 2.5% of aggregate CET1 capital for the highest level of outflows of 60%.

The drivers of the effect of the LCR on fire-sale losses can be seen in Figures 7. Using up cash reserves and high quality liquid asset buffers to pay out depositors will reduce banks' LCRs. As a result, if they wish to protect their LCRs, banks can no longer just sell liquid assets as they do if they disregard the LCR. The average market depth of the assets they sell is thus lower than if they chose not to protect their LCRs (Figure 7). Because they cannot use up all their cash reserves to meet outflows, they are also forced to sell a greater proportion of their assets. (Figure 7. The net result of these two factors is that should banks choose to defend their liquidity positions, it would be significantly larger following a funding shock.)

Figure 6: fire-sale losses for deposit outflow scenarios

Defend LCR  Don't defend LCR

Initial deposit outflows (% total deposits)

Fire sale losses (£bn)
Lesson 2: Risk-Based Capital More Binding Than Leverage Ratio

Figure 3: Fire-sale losses for variants of 2017 stress test scenario
Lesson 3: Spillover Effects Are Large

Figure 4: Breakdown of fire-sale losses for 2017 stress test scenario

- When we solve the model using all constraints, banks sell roughly the same amounts of assets, although slightly more skewed towards the liquid end of the market. This is because more banks are engaging in liquidations relative to the risk-weighted capital only case, but they sell more liquid assets.

- Finally, it is interesting to compare the results with the blue dotted line, given by the average market depth of their marketable assets portfolio. Apart from the largest shock, the average liquidity of assets sold is higher than that. This implies that, prior studies assuming that banks simply sell assets in proportion to their initial holdings (Cont and Schaanning (2017)), may over-estimate the impact of fire sales following moderately-sized shocks. For large shocks, banks end up selling almost their entire portfolios in order to comply with the regulatory requirements, which therefore leads to the circles lying almost on the average market depth for the 2017ACSx1.25 scenario.

Figure 4: Breakdown of fire-sale losses for 2017 stress test scenario

- Fire sale losses (£bn)
  - 2017 ACS
  - 2017ACSx1.1
  - 2017ACSx1.25

- Initial shock (multiples of 2017 stress test)
  - Expected losses
  - Unexpected losses
1. **Bank’s objective function**: minimize fire sale losses this period.
   - Trade-off between losses this period vs. positioning oneself to withstand shocks next period.

2. **Anticipating vs. internalizing** distressed sales by other banks.
   - In the model, banks completely fail to anticipate distressed sales by other banks.
   - Chernenko and Sunderam (2017): mutual funds that internalize more of the price impact of their trading hold more cash and use it more aggressively to accommodate fund flows.
   - What are the likely effects of greater transparency of bank holdings?

3. Securities holdings account for 7–28% of RWA of the 7 banks.

4. Spillovers to US and other banks.