Discussion of "Liquidity Regulation and Financial Intermediaries" and "Strategic Complementarities, Liquidity, and Fire Sales"

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Macchiavelli and Pettit (2018) in a nutshell

- Effects of Liquidity Coverage Ratio (LCR) on repo markets
- Exploit heterogeneous implementation across jurisdictions
  - US more stringent and faster
- Relative to non-US dealers, US delers:
  - increase maturity of low-quality repos
  - reduce repo-financing of their inventories of high-quality assets
- Nice paper on something important & new!
  - Expand implications: industry structure, ultimate cash lenders, & real economy

Background: LCR

Why? To mitigate risk of fire sales & market-wide runs in banking sector.

$$\text{LCR} = \frac{\text{Unencumbered HQLA}}{\text{Total 30-day Expected Net Cash Outflow}} \geq 100\%$$

HQLA (US version):

- Level 1 (eg, cash, excess reserves, Treasuries): Haircut: 0%
- Level 2A (eg, GSE debt & MBS): Haircut: 15%
- Level 2B (eg, investment-grade non-financial corporates): Haircut: 25-50%

30-Day ENCO: net cash outflows during prospective stress period

- prescribed run-off rates to assets, liabilities, & off-balance-sheet arrangements

LCR: US vs. rest of the world

More stringent:

- US: averages of daily values over quarter
- EU: averages of month-end values over quarter

Phased-in faster:

- Dec 2010: Basel Committee introduces LCR
- Dec 2011: US first proposal
- Sept 2014: US finalizes LCR
- Oct 2014: EU finalizes LCR
- Jan 2015: US begins at 80% requirement, reaching 100% in Jan 2017
- Oct 2015: EU begins at 60% requirement, reaching 100% in Jan 2018

$\Rightarrow$ US requirement always above EU one

Incentives for repo dealers

- lengthen repo maturity beyond 30 days (ENCO $\searrow$)
  - especially lower-quality collateral (assigned higher run-off rates)
- reduce short-term repo financing of low-quality assets (ENCO $\searrow$)
- reduce repo financing of high-quality assets (HQLA $\nearrow$)
  - repoed assets are encumbered!
- reduce collateral downgrades (HQLA $\nearrow$)

Paper's results on repo maturity: summary & first questions

US dealers relative to non-US:

	Share of maturity brackets		
Collateral	"overnight"	$[1, 30]$-day	$>$ 30-day
corporate	0	$-$	$+$
Agency MBS	$+$	$-$	$+$
Treasury	$+$	$-$	0

Overall consistent w/ expectations, but picture seems richer than that!

- $\uparrow$ Corporate-repo maturity compensated by $\downarrow$ Treasury-repo maturity
- Agency MBS: same average, greater dispersion (like a barbell strategy)

Questions:

- Overall average repo maturity? What about assets' maturity (reverse repos)?
- Is the "barbell" effect optimal?

Results on repo maturity: implications for ultimate cash lenders

Implications for their repo lenders? Look at MMFs!

Li (2018):

- 2010 SEC reform: average maturity of MMF portfolios 90→60 days
- LCR requires banks to use longer-term (LT) debt

$$\Rightarrow \text{Tension!}$$

Solution: "bundling" strategies across multiple unsecured funding markets

- MMFs lend LT more to banks satisfying their ON investment needs

Questions:

- Does the same thing happen in repo market?
- Unintended consequence: US MMFs rely more on EU dealers to place cash?

Paper's results: inventories financing & securities intermediation

US dealers:

- $\searrow$ repo-financing of HQLA inventories [✓]
- $\searrow$ collateral downgrades [✓]
- $\searrow$ collateral upgrades [×]
- $\nearrow$ corporate repos matched with corporate reverse [ambiguous]

Results are less clear-cut. Why?

Hard question related to business model: possible endogeneity issues!

Advice: Let's look directly at inventories as dependent variable!

Questions:

- Does LCR only change inventories' financing?
- Or it also changes level & type of inventories?

Open questions & further steps: cross-border regulatory spillovers!

1) Implications of different LCR implementations on repo market structure?
   - Have EU dealers increased repo intermediation relative to US ones?
   - Has their exposure to US MoPo (short-term rates) changed?

2) Implications of LCR for dealers' other activities on asset side?
   - Roberts, Schachar, and Sarkar (2018) look at lending to real economy

3) Implications of LCR for ultimate lenders (MMFs & their investors)?
   - Dealer concentration in short-term repos $\Rightarrow$ market power over MMFs $\Rightarrow$ affect pass-through of RRP-based MoPo to ultimate cash lenders

4) LCR increases demand for HQLA $\Rightarrow$ is there a premium for HQLA?
   - If so, what is its contribution to the convenience yield of Treasuries?

Branzoli and Guazzarotti (2018) in a nutshell

- Liquidity management & fire sales by Italian open-end mutual funds
- Based on model of strategic complementarities among investors
- **Results:**
  - Higher levels of cash reduces likelihood & intensity of future fire sales
  - Current fire sales associated with higher levels of cash tomorrow
- **Identification:**
  - Stronger effects when strategic complementarities are stronger
- Nice paper on something important & new!
  - Fire sales at the heart of systemic financial crisis
  - Asset management industry has increased massively over past 20 years

Glimpse of theory: mutual funds & global games (Morris et al., 2017)

- Investors sell/hold shares based on fund's future return
  - Uncertainty: each investor has idiosyncratic noisy signal

- To meet redemptions, fund can either use cash or liquidate asset
  - Illiquid asset $\Rightarrow$ transaction cost $\Rightarrow$ lower return for "staying" shareholders

- Investors: 1st-mover advantage & strategic complementarities

- Fund: tension in liquidity management! Selling illiquid assets today:
  - larger cash buffer tomorrow $\Rightarrow$ lower incentives to run
  - lower future returns $\Rightarrow$ higher incentives to run

Solution: Optimal cash holdings increase with asset illiquidity

- cash $>$ expected redemptions if illiquidity is expected to raise (hoarding)!

Back to the paper: results

- Great supervisory data: Italian open-end equity funds (2003-2016)
  - monthly frequency
  - gross & net flows, portfolio composition & individual asset trades!

$$\Downarrow$$

- Complementarities: portfolio liquidity based on asset-level measure
- Fire-sales: stocks sold by funds with abnormal outflows but held by others

Results:

- +1pp cash today $\rightarrow$ fire sale 20pp less likely tomorrow
- €1 outflow $\rightarrow$ -13 cents in cash (liquidity pecking order)
- fire sale today $\rightarrow$ cash build-up 8pp more likely today (cash hoarding)
- greater sensitivities for more illiquid funds

Advice & Question #1: Flow-performance relation

- Why are we talking about liquidity, runs, and crisis for mutual funds?
  - Equity investment, not debt!
  - Transitory price impact $\Rightarrow$ fund value should go back to fundamental ...
- Key assumption: investors' short-termism! They chase past returns.
  $\Rightarrow$ Flow-performance relation is the linchpin!

US mutual funds:

- Equity$\rightarrow$convex (Sirri & Tufano, 1998): mitigate run dynamics!
- Bond$\rightarrow$concave (Goldstein et al, 2016): amplify run dynamics!
- MMF$\rightarrow$rank (La Spada, 2018): amplify run & winner take-all dynamics!

Question: What's shape of flow-performance relation in Italy/Europe?

Advice & Question #2: Externalities

- Fire sales $\rightarrow$ pressure on other funds holding same asset!

- Cetorelli, Duarte, & Eisenbach (2016): Bond funds vulnerability to fire sales?

  0) Negative parallel shift of yield curve
  1) $\downarrow$ Fund performance $\Rightarrow$ Redemptions via flow-performance sensitivity
  2) Liquidation $\Rightarrow$ Negative price impact on funds with similar portfolios
  3) Back to (1)

  Second-round losses: 10-20 cents per \$1 of initial loss. Is it small?

- Chernenko & Sunderam (2018): endogenous response by funds!

  Greater portfolio overlap within family $\Rightarrow$ greater use of cash

- Cetorelli et al. (2016): fund-specific flow-performance

  Rank-based flow-performance $\Rightarrow$ further interactions *across* funds

Advice: Exploit granularity of dataset to directly measure externalities!

Advice & Question #3: What about investor sophistication?

- Strategic complementarities may depend on sophistication of fund investors!
- Schmidt et al. (AER2016): more sophistication $\rightarrow$ greater complementarities
  - sophisticated=informed $\Rightarrow$ respond to signals
- Goldstein et al. (JFE2016): more sophistication $\rightarrow$ less complementarities
  - sophisticated=large $\Rightarrow$ internalize externalities
- Cipriani, Gortmaker, & La Spada, 2018 (in preparation):

  MoPo pass-through to ultimate cash investors in RRP regime via MMFs:
  significantly larger for institutional investors!

Question/Advice: look at share of institutional investors in your analysis!

Advice & Question #4: How to mitigate run risk in mutual funds?

- Redemption gates & liquidity fees? Example from 2014 MMF reform!
- After October 2016, prime MMFs (but not government MMFs):
  - Retail: gates & fees (Institutional: also floating NAV)
- Cipriani & La Spada (2018):
  - Retail prime-to-government flows: $300-400 billion (total $1.2-1.3 trillion!)
  - Retail prime-government yield spread: goes up by 20 bp!

    This is compensation for liquidity loss: premium for money-likeness!
- **Very open question**: how to best mitigate run risk in mutual fund industry?
  - Should asset managers subject to liquidity regulation as banks? FSB (2017)

Back to Macchiavelli & Pettit (2018)

- Why are we considering these problems in isolation?
- Mutual funds' portfolios and bank's portfolios may well overlap!

  $\Rightarrow$ Potential for fire-sale spillovers across industries
- Many BHC offer mutual funds! More room for internalization?
- Maybe it's time for a more holistic approach ...

M&P (2018) on repo maturity: alternative specification

Authors consider maturity brackets separately $\rightarrow$ hard to test predictions.

For each collateral type, I would run:

$$\log(\text{Repo}_{itm}) = \alpha_{im} + \sum_{\tau} \gamma_{\tau 0} LCR_t^{(\tau)} + \sum_{\tau} \beta_{\tau 0} US_i \times LCR_t^{(\tau)} + \sum_{\tau}\sum_{m} \gamma_{\tau m} \mathrm{D}_m \times LCR_t^{(\tau)} + \sum_{m}\sum_{\tau} \beta_{\tau m} \mathrm{D}_m \times US_i \times LCR_t^{(\tau)} + \varepsilon_{itm}$$

i: dealer; t: week; $m = \text{ON}$ or > 30: maturity bracket ($[1, 30]$ omitted)

τ: LCR announcements; D_m: dummy for m-maturity

Pros:

- Built-in statistical test across maturity brackets (relative to $[1, 30]$)
- $\Delta \log(Repo)$ gives you % change in m-maturity repo financing (complementary to "share of total repo financing" used by authors)
- Robustness: add α_{it} & α_{mt} FE $\rightarrow$ stronger identification!
- Add collateral dimension (4-uple DiD): test all predictions in 1 regression!
- Report $\sum_{\tau} \beta_{\tau m}$ with associated F-stat!

Inventories financing & securities intermediation: alternative specification

Simple solution: put "Inventory" and "Securities In" on the LHS and check!

Let k: security type (omit one). I would run:

$$\log(y_{itk}) = \alpha_{ik} + \sum_{\tau} \gamma_{\tau 0} LCR_t^{(\tau)} + \sum_{\tau} \beta_{\tau 0} US_i \times LCR_t^{(\tau)} + \sum_{\tau} \sum_{m} \gamma_{\tau k} \mathrm{D}_m \times LCR_t^{(\tau)} + \sum_{\tau} \sum_{k} \beta_{\tau k} \mathrm{D}_k \times US_i \times LCR_t^{(\tau)} + \varepsilon_{itk}$$

y: *Inv*, *SecOut*, *SecIn*. You could also take LHS$= \log(SecOut_{itk}) - \log(SecIn_{itk})$

- Directly measure effect of LCR on business model of repo dealers
- Built-in statistical test of differences across jurisdictions and asset types
- If you think effect of LCR is stronger within specific asset classes, saturate w/ α_{it} and α_{kt} FE $\rightarrow$ stronger identification (triple DiD)
- You can easily add maturity dimension (if you want)

Further advice

- Exploit even more heterogeneity in LCR implementation across jurisdictions, institutions, and asset classes!
  - Roberts, Schachar, and Sarkar (2018): bank liquidity creation

    full-LCR banks $>$ \$250bn vs. mod-LCR banks [\$50, \$250]bn
  - Ginnie (Level 1) vs Fannie & Freddie (Level 2A)
  - UK implementation timeline even slower than EU
- Look at prices (repo rates) & haircuts!
- Explicitly control for other regulatory changes: Leverage Ratio!

Advice & Question #3: What determines flow-performance relation?

- What's the "fundamental" of a mutual fund? Manager's unobserved skill!
- Theory: Berk & Green (2004)
  - Rational Bayesian investors infer manager's skill from returns
  - Convex trading costs $\Rightarrow$ convex flow-performance relation
  - It works for equity funds (stock's price impact)
- Why is it concave for bond funds?
  - Investors' extreme risk aversion? What's the investment goal?
- Why rank-based for MMFs?
  - Homogenous investments & compressed spreads (performance)?
- Does it depend on MoPo via level of short-term rates? (Reach for yield?)
  - Do low rates increase investor sensitivity to fund performance?