Leveraged Funds and the Shadow Cost of Leverage

by Zhongjin Lu and Zhongling Qin

Discussant: Asaf Manela

Washington University in St. Louis

June 2020

WashU Olin Business School

Why do we care?

Measuring the shadow funding cost can educate both asset pricing and financial regulation

- Financial frictions for intermediaries matter for asset pricing
  - Theory (Brunnermeier-Pedersen 2009 RFS, He-Krishnamurthy 2013 AER; Brunnermeier-Sannikov, 2014 AER)
  - Evidence (Adrian-Etula-Muir, 2014 JF; He-Kelly-Manela, 2017 JFE)

Why do we care?

Measuring the shadow funding cost can educate both asset pricing and financial regulation

- Financial frictions for intermediaries matter for asset pricing
  - Theory (Brunnermeier-Pedersen 2009 RFS, He-Krishnamurthy 2013 AER; Brunnermeier-Sannikov, 2014 AER)
  - Evidence (Adrian-Etula-Muir, 2014 JF; He-Kelly-Manela, 2017 JFE)
- Regulatory constraints aim to prevent excessive risk due to government safety net
- Many opinions and theories
- Few empirical estimates
  - Structural estimates for life insurers (Koijen-Yogo, 2015 AER)
  - Loophole approach for banks (Kisin-Manela, 2016 RFS)
  - Loophole approach in IR swaps (Fleckenstein-Longstaff, 2018)

What the paper does?

- Provides a measure of "shadow cost of leverage constraints"

$$\text{Shadow cost} \approx \text{Return shortfall of leveraged fund} - \text{Return shortfall of unleveraged fund}$$

- Imagines a leveraged fund trading with another intermediary that passes along its leverage costs

Main findings

1. Shadow cost increases by 98 bps per year, upon quarter-ends
2. Shadow cost positively predicts future BAB returns
   - BAB portfolios are long low-β_{mkt} and short high-β_{mkt} assets
3. Negative correlation between shadow cost and contemporaneous BAB returns
4. Exposure to time variation in shadow cost negatively predicts stock returns in the cross section

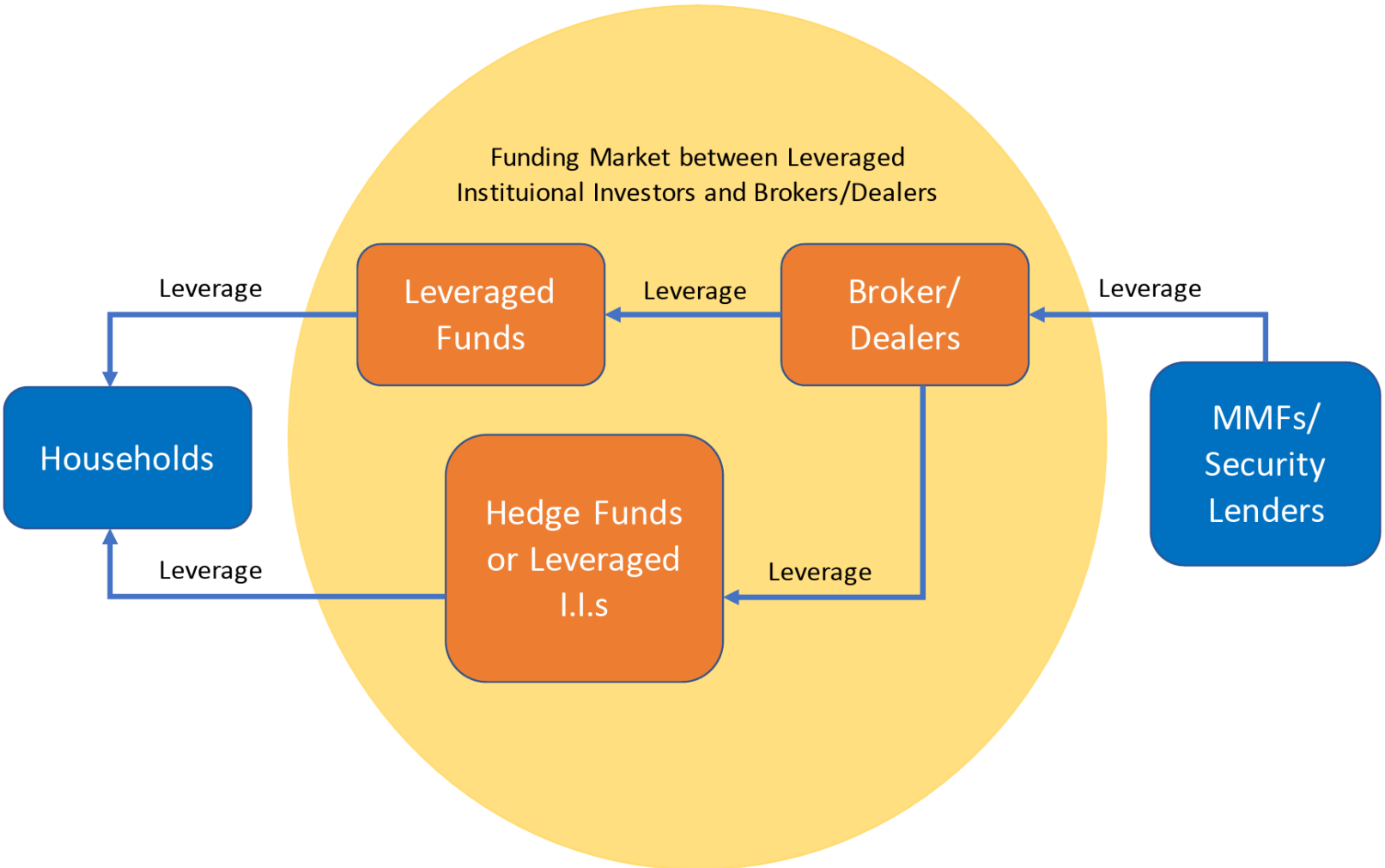
Contribution

- Leveraged fund-based shadow cost aligns with theory better than TED spread (Frazzini-Pedersen, 2014)
- Koijen-Yogo (2016) and Kisin-Manela (2016) quantify the shadow cost of capital for life insurers and banks, respectively
  - Current measure is more applicable to leveraged equity investors
  - Time-series and cross-sectional pricing tests of leverage constraints in equities

Suggestion 1: Explaining prices with fundamentals

- Claim "price" measure is better than "quantity" measures (Adrian-Etula-Muir, 2014; He-Kelly-Manela, 2017; Boguth-Simutin, 2018; Asness-Frazzini-Gormsen-Pedersen, 2020)
- But macro-finance agenda is to move away from explaining prices with prices (Cochrane, 2017)
- Takeaway from 2008 crisis was that intermediaries and financial frictions matter a lot
- What do we learn from your results about the fundamental constraints on their leverage?

Suggestion 2: Whose constraints?



Suggestion 3: Improve theoretical foundations

- Theoretical motivation (Garleanu-Pedersen 2011)
  Investor maximizes expected utility of consumption s.t. margin constraint

$$\sum_i m_{it} \left|\theta_{it}\right| + \eta_{ut} \leq 1$$

  then shadow cost *per asset* i is

$$\lambda_t m_{it} = \underbrace{\mu_{it} - r_{ft}}_{\text{Effective risk premium}} - \underbrace{\beta_{it}}_{\text{Consumption risk exposure}} \times \underbrace{\gamma_t}_{\text{Consumption risk premium}}$$

  - To measure the shadow cost using a spread, one needs two assets with same β_{it} and margin requirements m_{it}
  - Big ask!
- Paper actually measures something else

Suggestion 3: Improve theoretical foundations

- Return shortfall:

$$\alpha_{it} = \underbrace{\delta}_{\texttt{Leverage}} \times \underbrace{b_{jt}}_{\texttt{Benchmark return}} - \underbrace{r_{it}}_{\texttt{Leveraged fund return}}$$

Suggestion 3: Improve theoretical foundations

- Return shortfall:

$$\alpha_{it} = \underbrace{\delta}_{\texttt{Leverage}} \times \underbrace{b_{jt}}_{\texttt{Benchmark return}} - \underbrace{r_{it}}_{\texttt{Leveraged fund return}}$$

- Shadow cost of leverage constraints:

$$\psi_{it} = \frac{\alpha_{it} - \alpha_t^{1x}}{\delta - 1} - r_t^{GCrepo}$$

Suggestion 3: Improve theoretical foundations

- Return shortfall:

$$\alpha_{it} = \underbrace{\delta}_{\texttt{Leverage}} \times \underbrace{b_{jt}}_{\texttt{Benchmark return}} - \underbrace{r_{it}}_{\texttt{Leveraged fund return}}$$

- Shadow cost of leverage constraints:

$$\psi_{it} = \frac{\alpha_{it} - \alpha_t^{1x}}{\delta - 1} - r_t^{GCrepo} = b_{jt} - r_t^{GCrepo} - \frac{1}{\delta - 1}\left(r_{it} - r_{it}^{1x}\right)$$

Suggestion 3: Improve theoretical foundations

- Return shortfall:

$$\alpha_{it} = \underset{\texttt{Leverage}}{\delta} \times \underset{\texttt{Benchmark return}}{b_{jt}} - \underset{\texttt{Leveraged fund return}}{r_{it}}$$

- Shadow cost of leverage constraints:

$$\psi_{it} = \frac{\alpha_{it} - \alpha_t^{1x}}{\delta - 1} - r_t^{GCrepo} = b_{jt} - r_t^{GCrepo} - \frac{1}{\delta - 1}\left(r_{it} - r_{it}^{1x}\right)$$

  - Muddies the measure and can be dominated by $b_{jt} - r_t^{GCrepo}$

Suggestion 3: Improve theoretical foundations

- Return shortfall:

$$\alpha_{it} = \underset{\texttt{Leverage}}{\delta} \times \underset{\texttt{Benchmark return}}{b_{jt}} - \underset{\texttt{Leveraged fund return}}{r_{it}}$$

- Shadow cost of leverage constraints:

$$\psi_{it} = \frac{\alpha_{it} - \alpha_t^{1x}}{\delta - 1} - r_t^{GCrepo} = b_{jt} - r_t^{GCrepo} - \frac{1}{\delta - 1}\left(r_{it} - r_{it}^{1x}\right)$$

  - Muddies the measure and can be dominated by $b_{jt} - r_t^{GCrepo}$
- How about instead:

$$\psi_{it}^{*} = \frac{\alpha_{it}}{\delta} - \alpha_t^{1x} = r_{it}^{1x} - \frac{r_{it}}{\delta}$$

  - All about funding / operating differences and not the benchmark index

Suggestion 4: Units

- Shadow cost is 0.56% per year on average. Is that large?
- How much would the intermediaries be willing to pay to increase their leverage by X?

My Take

- Measuring shadow funding costs can inform both asset pricing and financial regulation
- Leveraged funds are super interesting institutions worth further study
  - New sample collected can advance this literature
- Interesting and intuitive results explaining and predicting BAB returns using leveraged-unleveraged fund spreads
- Tying up some theoretical loose ends and connecting more to fundamentals

Other suggestions / minor point

- Footnote 18: The ICR measure in He, Kelly, and Manela (2017) is the market capital ratio of the holding companies of primary dealers.