**Re-use of Collateral: Leverage, Volatility, and Welfare**

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# Overview

- Collateral re-use is an important friction in financial markets

- The paper provides detailed background

- *Main objective:* to understand asset pricing and welfare implications

- *Key results:*

    - Re-use gives rise to higher leverage

    - Volatility decreases as re-use limits become tighter

    - Re-use limits can be welfare improving.

# Model
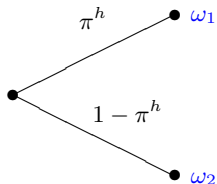


- Infinite horizon economy with multiple states $\omega_k$ and rare disasters

- Two EZ investors with different risk aversions and beliefs $\pi^h$

  - Investor 2 is pessimistic and more risk-averse than investor 1

- Investors receive endowments proportional to aggregate endowment

- Tradable assets: riskless bond and a stock

# Model (cont'd)

- Investors have limited liability, endowments cannot be pledged.

- Collateral constraint requires pledgeable financial wealth to be positive:

$$\underbrace{\phi^h(s^t)}_{\text{bond holding}} + \underbrace{\theta^h(s^t)(q(s^{t+1}) + d(s^{t+1}))}_{\text{stock holding payoff}} \geq 0 \tag{1}$$

- Naked short sales are prohibited, investors can re-use collateral

- Re-use of collateral restricts short-selling by risk averse pessimist:

$$\theta^h(s^t) \geq -\kappa \frac{\max\{0, -\phi^{-h}(s_t)\}}{\min\limits_{s_{t+1}}\{q(s^{t+1}) + d(s^{t+1})\}} \tag{2}$$

- Short-sale constraint is a special case when $\kappa = 0$

# Model (cont'd)

- Paper studies asset pricing implications and the welfare effects.

- Investor 1 borrows from 2 using stocks as collateral

- Investor 2 shorts collateral, subject to re-use constraint

- Mechanism is as follows:

  - Decreasing $\kappa$ restricts short-selling;

  - Leverage also goes down;

  - Risk-sharing and trading is restricted;

  - Volatility decreases as a result.

# Model (cont'd)

- *Compensated gains:* compensate agent 1 by transfer to/from agent 2.

- Transfer is such that welfare of investor 1 the same as before the change.

- Welfare assessed under various convex combinations of beliefs.

- *Key result:* there is optimal level of re-use that balances two effects.

    - Higher $\kappa$ improves risk-sharing.

    - Lower $\kappa$ discourages speculation.

# Comments

- Maybe, further clarify "collateral constraint" vs "re-use"

- Collateral constraint also restricts both short-selling and leverage

  – It requires to collateralize any short positions with tradable bonds

  – Why shouldn't investors be allowed to collateralize using bonds?

  – Why should they "re-use" stock collateral instead?

- Reason seems to be that

  – Repo loan cannot be used as collateral $\Rightarrow$ re-use needed to short

  – Paper uses repo as an example where re-use may arise

- Maybe, say explicitly that long "bond" cannot be used as collateral

  – Constraint (1) mainly needed to restrict investor 1's borrowing

  – But (1) with $\phi^h > 0$ seems redundant for investor 2 given (2)

# Comments (cont'd)

- Other constraints also restrict leverage (e.g., borrowing, margin)

- Similar to tighter re-use, these constraints

  - Can restrict leverage and decrease volatility

  - The same welfare intuition goes through as well

- Short-sales also decrease volatility because of restricted risk-sharing

- Would be interesting to compare the qualitative effects

  - Quantitative effect of $\kappa = 0.2$ vs $\kappa = 0$ (short-sale constraint) small

- Any sense about short-sale with "re-use" as % of all short-sales?
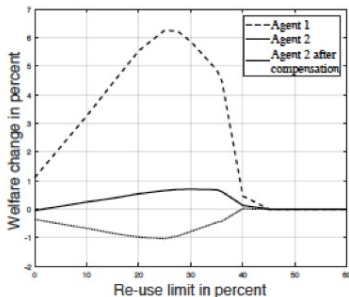
# Comments (cont'd)

- Is re-use regulation primarily needed to limit speculations or contagions?

- Qualitative effects might be different with many trees and agents:

  - Agent $i$ may borrow from agent $j$ to buy tree $k$ using tree $m$ as collateral

  - Or, agent $i$ may short some trees, long others, and lend, etc.

  - Their positions/re-uses will define a network.

  - Endogenous re-use networks may arise

- This might be an interesting extension with new effects

  - E.g., bad shock to one asset affects its collateral value

  - This asset becomes worse collateral for shorting other assets

  - Values of other assets are affected as a result $\Rightarrow$ market volatility unclear

- Authors seem to have methodology to study this

# Comments (cont'd)

- Paper studies simulated stats for interest rates, volatilities, Sharpe ratios

- Why not plot them as functions of wealth share (as prices and holdings)?

- Conditional effects are also important:

  - Are volatilities etc. higher/lower in states where constraints are tight?

  - Pro-/counter- cyclicality of equilibrium processes?

  - Simulated plots also might be useful to, e.g., spot clustering of volatilities

- Is there excess volatility (relative to dividend volatility)?

# Comments (cont'd)



- Welfare analysis is a nice application of Brunnermeier et al (2014)

- Welfare transfers should be better explained

- There seem to be welfare gains if transfers are allowed

  – How to implement transfers in practice?

# Comments (cont'd)

- Paper disentangles effects of speculation and risk-sharing on welfare

- One calibration has identical beliefs but different risk-aversions

    - Why are they shorting if beliefs are the same?

    - Might be because endowment perfectly correlated with dividends

    - Then, investors may short to decrease total holding of the tree

    - If so, this should be explained

    - How large are short positions?

- Also, why is the plot for agent 1 on Figure XI hump-shaped?

    - There is no speculation, so previous intuition does not seem to apply

    - Shouldn't loose re-use improve risk sharing for both investors?

# Comments (cont'd)

- Change in re-use affects welfare via two channels

    – Direct effect: change in risk-sharing opportunities

    – Indirect effect: change in prices in equilibrium

- Might be interesting to disentangle these effects

- Might explain welfare non-monotonicity when both have correct beliefs

- The paper studies welfare assuming median wealth share

    – How about unconditional welfare at time $t = -1$?

    – Consider value functions averaged across states and ergodic distribution.

# Conclusion

- Interesting and well-written paper

- Studies an important friction and its effects on welfare and prices

- Some extensions may generate further interesting effects.