

Discussion: Two Papers on Funding Liquidity

“Limited Market Access and Funding Liquidity”

By Zhuo Chen and Andrea Lu

“Systemic Funding Liquidity Risk and Bank Failures”

By Han Hong and Deming Wu

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Market Liquidity and Funding Liquidity

Are “market liquidity” and “funding liquidity” the same concept or different concepts?

- ▶ Many researchers think they are different.
- ▶ Two papers do not directly address this issue.
- ▶ PK thinks market and funding liquidity are the same.
 - ▶ Kyle and Xiong (2003): Both are the same as returns volatility, with positive correlation.
 - ▶ Kyle and Obizhaeva (2013): Both are the same, since market liquidity takes time into account.

PK thinks market liquidity and funding liquidity for banks may converge in the future due to risks associated with prime brokerage activities of banks.

Jan Krahenen's Keynote

Two Types of Funding Liquidity:

- ▶ Bank Borrowing Spreads: Distorted by regulatory forbearance.
Hong and Wu paper: Uses interbank interest rate spreads, show systemic component of funding liquidity predicts bank failure rates.
- ▶ Equity Market Data: Funding liquidity related to haircuts influenced by volume and volatility, less affected by regulatory forbearance.
Chen and Lu paper: Funding shocks as innovations in difference between zero-beta “betting-against-beta” strategies across high liquidity and low liquidity stocks.

Krahenen: Two types of liquidity are diverging in EU. Perhaps indicates forbearance is increasing?

Differences between papers might explain forbearance.

Chen and Lu: Basic Idea

- ▶ Like market beta risk, funding liquidity costs command a risk premium: Higher risk premium for less liquid assets.
- ▶ Question: In CAPM world, low beta stocks seem to outperform high beta stocks. Is this due to differences in funding liquidity costs?
- ▶ Conventional wisdom: Perhaps not, because zero beta “betting-against-beta” strategy not correlated with standard measures of funding liquidity?
- ▶ Idea of paper: Look at difference in difference between “betting-against-beta” strategy for low funding-liquidity and high funding-liquidity stocks.

“Toy Leverage-CAPM Model” Motivates Idea

- ▶ Investors with high risk tolerance want high market exposure but leverage is expensive and stock specific haircuts are binding.
Shift investments in all stocks from low-beta to high beta stocks to economize on leverage costs
- ▶ Investors with low risk tolerance use no leverage.
Overweight low beta stocks since they offer favorable risk-return tradeoff.
- ▶ Equilibrium implies stock-specific risk premium per unit of beta is sum of market risk premium (from CAPM) and term proportional to margin per unit of beta.
- ▶ Difference in difference strategy captures funding liquidity cost differences. Innovations capture innovations in funding liquidity costs.

Does Toy Leverage-CAPM Model Make Sense?

PK thinks NO.

- ▶ Funding liquidity costs should show up at portfolio level. Toy model has funding costs based on idiosyncratic risk, not market risk.
- ▶ Cheapest way to obtain beta is to buy index ETFs, S&P futures contracts, or equity index swaps.
- ▶ At a deeper level, shocks to funding liquidity costs propagate across assets in non-linear manner: small distressed value stock may have 100% margin both before and after shock. Funding costs of large liquid assets move more when shocks hit since volatility increases more. Not all stocks leveraged.

Rest of Paper is Empirical

Problem: Margins on equity securities is not observed. Therefore need empirical proxies. (HARSH POINT: THIS SHOULD NOT BE A FOOTNOTE!)

- ▶ Empirical proxies for funding liquidity “margin requirements”: (1) size, (2) idiosyncratic (!) volatility, (3) Amihud (standard deviation / dollar volume), (4) institutional holdings, (5) analyst coverage.
- ▶ Sort stocks into 5 funding liquidity groups for each of 5 funding liquidity proxies.
- ▶ Construct difference and difference-in-difference returns for 5 betting-against-beta portfolios. Extract first principal component.
- ▶ Compare time series of monthly innovations (“shocks”) to 14 funding liquidity proxies in literature.

Results: Consistent with Jan Krahen's Comments

- ▶ 14 measures: Broker-dealer asset growth, bond liquidity premium, investment banks' CDS spreads, credit spreads, financial sector leverage, hedge fund leverage, investment bank excess return, broker-dealer leverage, loan tightening, LIBOR, swap spread, TED spread, term spread, VIX.
- ▶ Use AR-2 residuals to remove autocorrelation.
- ▶ Difference-in-difference portfolio of "funding liquidity shocks" (FLS) correlated significantly with 11 of 14 measures, but simple difference portfolio is not significantly correlated with most. 50% quarterly correlation of principal component with principal component at quarterly level
- ▶ SMB portfolio and HML for small stocks load positively on FLS; largest stocks have negative loading.

Application to Hedge Funds

- ▶ 12 of 21 hedge fund strategies have positive significant correlation with FLS, especially long-short equity, relative value corporate fixed income, event-driven distress; Not macro and emerging markets.
- ▶ Hedge fund quintile with lowest loadings on FLS (not dependent on liquidity) outperform other quintiles by factor of 4 during 1996-2006 ($t = 3.31$, 89 bp per month).
- ▶ Why? Hedge funds investing in distressed securities made high returns and were providers of liquidity, not demanders of liquidity (thus low loading on FLS).

What Does this Mean?

- ▶ We expect hedge funds to be providers of liquidity to financial system. Do results support this?
- ▶ Is prime brokerage risk an important source of future systemic risk?
- ▶ Are empirical results consistent with assumptions in toy model?
- ▶ Are results consistent with uses of levered and unlevered ETFs?

Suggestion: Use Kyle and Obizhaeva (2013)

“Market microstructure invariance” yields liquidity measure L which measures both market liquidity and funding liquidity:

$$L = \text{const} \cdot \left(\frac{\text{Dollar Volume}}{\text{Percentage Returns Variance}} \right)^{1/3} \quad (1)$$

- ▶ L takes into account time to liquidate illiquid collateral.
- ▶ L based on consistent units.
- ▶ $1/L$ measured in basis points.
- ▶ Correlated with Amihud measure for liquid stocks; generalizes to illiquid assets.

Discussion of Hong and Wu Paper: Idea

- ▶ Banks fail because of insolvency and illiquidity, idiosyncratic and systemic reasons.
- ▶ Use empirical proxies for insolvency, idiosyncratic illiquidity, systemic illiquidity to model why banks fail.
- ▶ Atheoretical (anti-theoretical?) empirical model of insolvency based on accounting ratios.
- ▶ Forebearance, government intervention, politics are in the background.

Results

- ▶ Model predicts high failure rates in both 1988-1991 and 2009-2010 well. Also predicts lack of failures in other periods well.
- ▶ Model works well out-of-sample.
- ▶ Liquidity risk predicts failures better than solvency.
- ▶ Systemic liquidity measures more important than bank specific liquidity measures.

What is Solvency? What is Liquidity?

- ▶ Liquidity: Ability to meet obligations in timely manner without significant losses.
- ▶ Solvency: PK thinks it is ability to issue substantial amount of equity. This is a necessary component of a regulatory definition based on protection of taxpayers from losses. Accountants use measures of book value, which PK thinks is wrong.

PK: Important Point

Liquidity and solvency cannot easily be separated.

- ▶ Market will not want to provide liquidity to an insolvent bank.
- ▶ Banks with low capital levels use short term borrowing to reduce haircuts; therefore become less liquid. Shift to secured borrowing lowers cash reserves.
- ▶ PK thinks solvency and liquidity are observationally equivalent, except when possibility of government bailouts protects insolvent banks from runs.
- ▶ Systemic measures (both liquidity and solvency) might mostly capture perception of implicit guarantees.

Fundamental Criticism

- ▶ Paper breaks liquidity into idiosyncratic and systemic components, but it does not do this with solvency, which is essentially idiosyncratic only.
- ▶ “Systemic solvency” measure might be “market-to-book” ratio of traded banks’ equity valuation.
- ▶ Paper says only 200 of 6,000 banks public traded, therefore ignores market value of equity. PK thinks this is big mistake.
- ▶ Better approach is to compare bank valuation model based on accounting ratios with market prices. Treat the difference (log ratio) as market’s measure of systemic solvency, FOR ALL BANKS, INCLUDING THOSE NOT PUBLICLY TRADED.

Including Market Value of Equity

- ▶ Market value of bank equity might be correlated with systemic liquidity measures.
- ▶ Differences in market measures based on borrowing costs and equity values might reflect changes in perceptions concerning implicit guarantees? Which securities get bailed out? Equity? Junior debt? Senior debt only?
- ▶ If correlation is high, solvency might take over some of the explanatory power of systemic liquidity measures.

Paper Takes Anti-Theory Approach

- ▶ Paper has underlying theory based on option pricing and market prices.
- ▶ Paper cites Friedman that models should be judged based on ability to predict (not consistency with theory).
- ▶ Perhaps paper reverse engineers information regulators use to close or bail out banks.
- ▶ Perhaps the regulators do not have a theory (but I doubt it) and have not changed their non-theory over the years, leading to predictability.
- ▶ Why so many bank closings in 1988, when failed banks had been insolvent for more than 10 years? POLITICS.

Dangerous to Ignore Market Prices

- ▶ PK: Theory says take market prices seriously.
- ▶ Paper says
“Since current market prices of assets may not be indicative of their long-term economic values in times of market panic, market value accounting could lead to excessive and artificial volatility.”
- ▶ This leads to DCF model based on same logic that state and local pension funds use to justify underfunding.

How Paper Works

Log of failure probability is sum of three components

- ▶ Solvency model using accounting ratios (book values) to approximate a discounted cash flow model which ignores market prices. Ingredients include return on equity, capital levels, loan loss reserves, Texas ratio.
- ▶ Idiosyncratic liquidity factors: Brokered deposits and Treasury holdings.
- ▶ Systemic liquidity factor: TED spread.

Critique of Model

- ▶ DCF solvency model should implement option pricing approach. Standard DCF puts cash flow adjustments in “denominator,” not “numerator.”
- ▶ Horizon of bank cash flows should have a decay factor, related to horizon to collection of loans.
- ▶ Should state fixed effects be insignificant if model is good?
- ▶ Model should work in other countries unless it is capturing specific features of U.S. politics.