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"Market Liquidity and Funding Liquidity: Implications for Economic Risk"
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Funding Liquidity Risk and the Cross-Section of Stock Returns

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Contribution:

- Theoretically, funding liquidity risk should be priced (Garleanu and Pedersen, 2011, RFS)- Margin CCAPM
- Imperially, Adrian, Etula, Muir (2013 JF forthcoming, AEM) - Financial intermediary SDF (brokers-dealers leverage BDL) explains the cross-section of size, B/M, momentum and bond portfolios- the leverage decreases when funding conditions deteriorate

- Fontaine and Garcia (2012 RFS) – Treasury bond based measure of funding liquidity (FL)
- **Cross-sectional pricing with FL for illiquidity and volatility portfolios**
- Difference from AEM (2013): BDL explains size and book to market, and momentum portfolios, while FL explains size portfolios (and with mixed success momentum portfolios). As the authors show, BDL does not work very well on size portfolios.
- Further, combination of FL and Pastor-Stambaugh liquidity Factor (traded returns) – improves the model fit and outperforms all other competitors

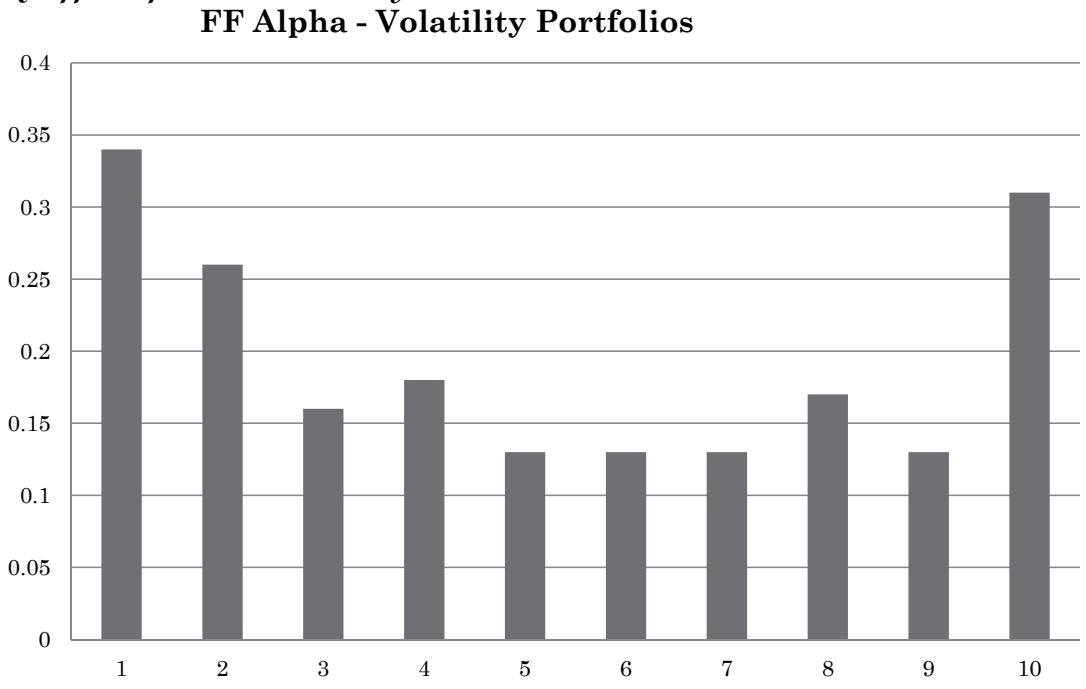
FL and other measures

- Amihud (2002) ILLIQ (stock market Illiquidity)
- BAB Betting-against-Beta (BAB) factor from Frazzini and Pedersen (2011) – from Lasse Pedersen webpage (through 2011)
- LMP – leverage mimicking portfolio (monthly traded returns), projected BDL (AEM 2013) onto the return space (through 2009) from Tyler Muir
- TED spread

	FL_delta	BAB	LMP	ILLIQ_delta	TED
FL_delta	1				
BAB	*-0.165*	1			
LMP	*-0.163*	*0.509*	1		
ILLIQ_delta	0.004	-0.060	0.003	1	
TED	0.088	-0.297	-0.216	0.064	1

Test Assets

- 10 Illiquidity and 10 Volatility Portfolios
- Motivation, Brunnermeier and Pedersen (2009): "funding shocks raise the dispersion of equities illiquidity, volatility and *returns*"
- I would love to see the *dispersion in returns (1/10 vs 2/9): may be removing ILLIQ effect from volatility?*



Market Liquidity vs Funding Liquidity

Panel (a) Alternative Proxies

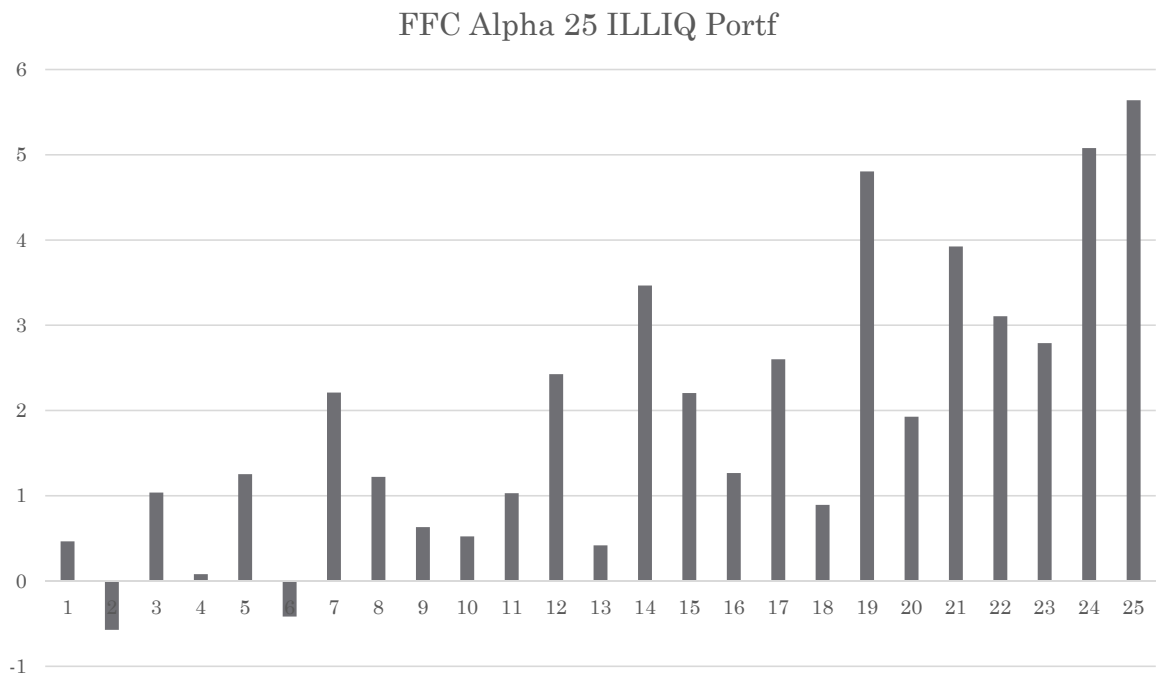
α	10.41	-0.45	10.87	-0.89
	(3.43)	(-0.11)	(3.31)	(-0.26)
	(3.42)	(-0.08)	(2.41)	(-0.19)
ΔFL				
BAB	-3.05			
	(-0.72)			
	(-0.72)			
Am		-1.18		
		(-1.73)		
		(-1.27)		
PS			-0.45	
			(-2.99)	
			(-2.19)	
TED				-4.96
				(-2.21)
				(-1.62)
R^2	13.85%	21.04%	31.52%	31.04%
	[0.10, 52.71]	[0.59, 43.26]	[0.08, 78.54]	[0.30, 60.83]
$\bar{R}^2$	9.32%	16.65%	27.92%	27.21%
	[-5.00, 50.88]	[-4.58, 40.26]	[-5.18, 78.14]	[-5.42, 58.66]

Panel (b) Augmented Models

α	-2.39	-0.13	-0.71	0.92	-2.72
	(-0.66)	(-0.04)	(-0.17)	(1.95)	(-0.69)
	(-0.47)	(-0.03)	(-0.11)	(1.33)	(-0.50)
ΔFL	-4.22	-3.59	-5.00	-3.33	-4.02
	(-2.43)	(-2.84)	(-3.36)	(-2.93)	(-2.57)
	(-1.73)	(-2.18)	(-2.15)	(-2.02)	(-1.87)
BAB		7.65			
		(1.95)			
		(1.66)			
Am			0.46		
			(1.05)		
			(0.67)		
PS				-0.35	
				(-2.55)	
				(-1.75)	
TED					-0.94
					(-0.75)
					(-0.55)
R^2	49.46%	39.25%	50.63%	94.14%	49.57%
	[17.84, 70.81]	[9.29, 63.16]	[17.16, 73.68]	[85.86, 98.34]	[13.26, 67.68]
$\bar{R}^2$	46.65%	32.50%	44.82%	93.49%	43.63%
	[14.93, 69.49]	[0.03, 57.83]	[8.43, 71.18]	[84.54, 98.18]	[6.55, 64.59]

25 ILLIQ (Amihud 2002) Sorted Portfolios

	Alpha	t-stat
Low	0.465	0.62
p2	-0.572	-0.62
p3	1.038	0.92
p4	0.081	0.07
p5	1.253	0.91
p6	-0.418	-0.36
p7	2.210	1.62
p8	1.222	0.81
p9	0.633	0.40
p10	0.523	0.38
p11	1.030	0.68
p12	2.427	1.63
p13	0.417	0.26
p14	3.467	2.30
p15	2.205	1.53
p16	1.266	0.85
p17	2.601	1.59
p18	0.892	0.55
p19	4.805	3.06
p20	1.927	1.17
p21	3.924	2.54
p22	3.106	2.17
p23	2.791	1.87
p24	5.079	3.17
High	5.639	3.48
High-Low	5.174	3.16



Market Liquidity vs Funding Liquidity: Horserace – 25 ILLIQ portfolios

α	0.008	0.007	0.007	0.007	0.007	0.006	0.007
	(2.07)	(2.22)	(2.1)	(2.39)	(2.27)	(1.86)	(2.07)
MKTrf	-0.002	-0.001	0.000				-0.001
	(-0.42)	(-0.25)	(-0.11)				(-0.17)
SMB		0.003	0.003				0.003
		(1.39)	(1.37)				(1.45)
HML		0.002	0.002				0.001
		(0.95)	(1.04)				(0.59)
ΔILLIQ			-0.235	-0.418		-0.366	-0.187
			(-2.06)	(-2.76)		(-2.55)	(-1.64)
ΔFL					-0.047	-0.037	-0.006
					(-1.32)	(-1.2)	(-0.24)
Adj Rsqr	0.09	0.24	0.25	0.08	0.08	0.13	0.25

Endogeneity: Market & Funding Liquidity

$$\Delta ILLIQ_{i,t} = \gamma_{0,i} + \gamma_{1,i}\Delta FL_t + \gamma_{2,i}\Delta ILLIQ_t^{mkt} + \xi_{i,t}$$

	Most	2	3	4	5	6	7	8	9	Least
					Illiquidity Portfolios					
γ_1	12.12	0.13	-0.07	0.20	0.22	0.15	0.08	0.05	0.03	0.01
	(2.08)	(0.07)	(-0.10)	(0.60)	(1.66)	(2.55)	(2.57)	(2.73)	(3.21)	(2.30)
γ_2	776.56	93.14	30.40	12.74	5.47	2.23	1.13	0.55	0.26	0.09
	(26.67)	(9.72)	(8.20)	(7.78)	(8.24)	(7.54)	(7.08)	(6.03)	(6.19)	(4.80)
R^2	70.94%	24.18%	18.43%	17.22%	19.74%	18.33%	16.78%	13.56%	14.90%	9.24%
$\bar{R}^2$	70.75%	23.67%	17.88%	16.67%	19.20%	17.79%	16.22%	12.98%	14.33%	8.63%

Feedback Effect

VAR(1):ΔILLIQ, ΔFL

	ΔILLIQ	ΔFL
ΔILLIQ	-0.45525	0.022776
	[-8.98374]	[2.11840]
ΔFL	0.142726	0.033191
	[0.53575]	[0.58722]
C	-0.0071	0.00157
	[-0.07690]	[0.08010]

Granger causality:

Dependent variable:	ΔILLIQ	
	Chi-sq	Prob.
ΔFL	0.287029	0.5921

Dependent variable:	ΔFL	
	Chi-sq	Prob.
ΔILLIQ	4.487628	0.0341

PS vs FL

Panel (a) Liquidity Portfolios

		Illiquid	2	3	4	5	6	7	8	9	Liquid
Lo Liq	β^{FL}	-7.32	-7.81	-7.61	-6.93	-6.72	-7.7	-6.73	-7.07	-5.93	-5.05
		(-5.17)	(-4.31)	(-4.17)	(-3.70)	(-3.97)	(-4.46)	(-4.02)	(-4.33)	(-4.11)	(-3.58)
	β^{PS}	-3.59	-16.41	-18.48	-10.01	0.77	7.26	6.48	5.19	6.08	4.03
		(-0.31)	(-1.12)	(-1.25)	(-0.66)	(0.06)	(0.52)	(0.48)	(0.39)	(0.52)	(0.35)
Hi Liq	β^{FL}	-0.16	0.09	0.43	-0.03	-0.15	-0.46	-0.7	-0.19	-0.37	-0.72
		(-0.14)	(0.07)	(0.35)	(-0.02)	(-0.13)	(-0.41)	(-0.60)	(-0.18)	(-0.36)	(-0.74)
	β^{PS}	-31.26	-25.88	-21.63	-15.42	-10.82	-15.65	-9.60	-8.36	-8.94	-7.17
		(-3.05)	(-2.06)	(-1.85)	(-1.33)	(-0.95)	(-1.48)	(-0.87)	(-0.82)	(-0.94)	(-0.78)

- What else does PS capture (besides market illiquidity)?
- Fanzoni, Nowak, and Phalippou (JF 2012) - there is a negative relationship (-0.63 correlation) between a dry-up in funding liquidity (measured by the tightening in credit standards) and innovations in market liquidity (the Pastor and Stambaugh measure).

Funding Liquidity & FL

- Double-Sorted Liquidity and Volatility Portfolios

	Panel (a) Alternative Proxies				Panel (b) Augmented Models			
α	10.21	9.49	10.70	10.2	-0.99	5.44	1.85	4.94
	(3.36)	(2.69)	(3.31)	-2.89	(-0.37)	(1.37)	(1.44)	-1.22
	(3.36)	(2.68)	(2.55)	-2.89	(-0.27)	(0.81)	(0.98)	-0.82
ΔFL					-3.85	-4.75	-2.96	-3.97
					(-4.02)	(-3.69)	(-2.37)	3.08
					(-3.01)	(-2.20)	(-1.62)	2.08
BAB	-1.22				10.85			
	(-0.27)				(2.67)			
	(-0.27)				(2.20)			
Amihud		-0.09				1.04		
		(-0.16)				(2.53)		
		(-0.16)				(1.51)		
PS			-0.39				-0.39	
			(-3.18)				(-3.15)	
			(-2.47)				(-2.17)	
TED				-0.05				2.68
				0.02				-1.62
				0.02				-1.1
R_c^2	1.29%	0.23%	50.19%	0.01%	28.26%	36.86%	68.73%	35.42%
$\bar{R}_c^2$	-3.00%	-4.11%	48.03%	-4.34%	21.73%	31.12%	65.89%	29.55%
R^2	1.60%	0.23%	31.76%	0.01%	28.44%	36.86%	78.72%	35.42%
$\bar{R}^2$	-2.50%	-4.11%	28.92%	-4.34%	22.22%	31.12%	76.87%	29.55%

Summary

- Very nice and intuitive paper
- Too many results…..
- What are the dimensions of funding liquidity risk? BDL /FL /BAB/PS and which one FL is capturing
- Better understanding volatility portfolio return dispersion and their link to funding liquidity (controlling/conditioning perhaps on the market liquidity)
- Exploiting/controlling for market-funding liquidity endogeneity
- Market liquidity control: Amihud (2002) ILLIQ is in levels, while PS is a trading factor, - factors/or levels? What is the story for the market illiquidity?
- Settling on/suggesting a benchmark model (a single factor FL model, or MKT+FL, or 3FF+FL) – discussion about the best specification