Discussion of "Banks, Dollar Liquidity, and Exchange Rates" by Javier Bianchi, Saki Bigio, and Charles Engel

Jenny Tang

Federal Reserve Bank of Boston

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Main Motivation

Theory of exchange rate determination based on an endogenous liquidity premium

- Microfounded model of liquidity premium from interbank market search frictions
- Frictions drive precautionary demand for dollar reserves/assets that appreciates the dollar
- Find model-consistent correlation between EURUSD and dollar liquidity ratio

Literature: UIP Deviations

Fits in literature seeking to understand exchange rate movements and explain puzzles (disconnect, excess volatility, etc) by finding source of UIP deviations

- "Pure" risk premia Bansal and Shaliastovich (2013), Colacito (2009), Colacito and Croce (2011, 2013), Colacito et al. (2018a,b), Lustig and Verdelhan (2007), Verdelhan (2010), Burnside et al. (2011), Farhi and Gabaix (2016), and Farhi et al. (2015)
- Limits/frictions to capital flows Alvarez et al. (2002, 2009), Itskhoki and Mukhin (2019), Gabaix and Maggiori (2015), Evans and Lyons (2002, 2008), Bacchetta and Van Wincoop (2010)
- Deviation from full info rational expectations (FIRE) Frankel and Froot (1987), Froot and Frankel (1989), Chinn and Frankel (2019), Gourinchas and Tornell (2004), Bacchetta and Van Wincoop (2006), Stavrakeva and Tang (2020c)
- Liquidity premia or convenience yields Engel (2016), Valchev (2020), Jiang et al. (2018), Engel and Wu (2018)

Also relates to literature on dominance of the dollar Gopinath and Stein (2018), Gourinchas et al (2019), Gopinath et al. (2020), Chahrour and Valchev (2020),...

Motivating Empirical Fact

For euros per USD:

Table 1: Relationship of change of exchange rates and measures of banking liquidity

	01M2-18M1	01M2-18M1	05M1-18M1	05M1-18M1
$\Delta(\text{LiqRat}_t)$	0.214***	0.223***	0.234***	0.251***
	(3.974)	(4.160)	(4.198)	(4.469)
$\Delta(i_t - i_t^*)$	-1.466		-2.498**	
	(-1.501)		(-2.356)	
$\pi_t - \pi_t^*$	-0.005***	-0.005***	-0.005***	-0.005***
	(-3.284)	(-3.227)	(-2.983)	(-2.888)
(LiqRat_{t-1})	0.009*	0.010**	0.009	0.012*
	(1.843)	(2.180)	(1.437)	(1.783)
constant	-0.011***	-0.012***	-0.011*	-0.012**
	(-2.965)	(-3.178)	(-1.959)	(-2.167)
N	204	204	157	157
adj. R^2	0.10	0.10	0.15	0.12

t statistics in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

where LiqRat_t is $\frac{\text{Reserves+Treasuries}}{\text{Deposits+Financial Comm. Paper}}$ for U.S. banks.

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- Each period has two stages:
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  2. Balancing: Banks face withdrawal shocks and borrow/lend in an interbank market with matching frictions or borrow at a penalty rate from the CB if a match is not achieved
- Reserves must remain positive at the end of the period
- Market segmentation: Liabilities must be settled using reserves in the same currency
- Assume larger volatility of dollar deposits

Liquidity Premium Adjusted Interest Parity Condition

Key equilibrium condition:

$$\mathbb{E}_t \frac{1+i_t^m}{1+\pi_{t+1}} - \mathbb{E}_t \frac{(1+i_t^{m,*})(1+e_{t+1})}{(1+e_t)(1+\pi_{t+1})} = \underbrace{\mathbb{E}_{\omega^*}\left[\chi_{m^*}\left(s^*;\theta^*\right)\right] - \mathbb{E}_{\omega}\left[\chi_m\left(s;\theta\right)\right]}_{\text{dollar liquidity premium (LP)}} = \mathcal{LP}$$

- Not in the paper, but could linearize and express realized exchange rate changes as function of changes in expectations over future relative interest rates and liquidity premia

  Froot and Ramadorai (2005); Engel and West (2005, 2006, 2010); Engel, Mark and West (2006, 2008); Mark (2009); Engel(2014, 2016); Stavrakeva and Tang (2020)

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Simulations from the model with just the first two shocks qualitatively replicate the empirical results.

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- The model delivers the dollar liquidity premium as a driver of these deviations.
- Then what is the motivation for focusing on asset quantities instead of the liquidity premium?
  - Is quality of measurement a reason?
  - One concern: Changing regulatory landscape $\rightarrow$ penalty function $\chi_{m^*}(s^*; \theta^*)$ is not a time-invariant function of the liquidity ratio so exchange rates may have a more stable relationship with liquidity premia than the liquidity ratio.

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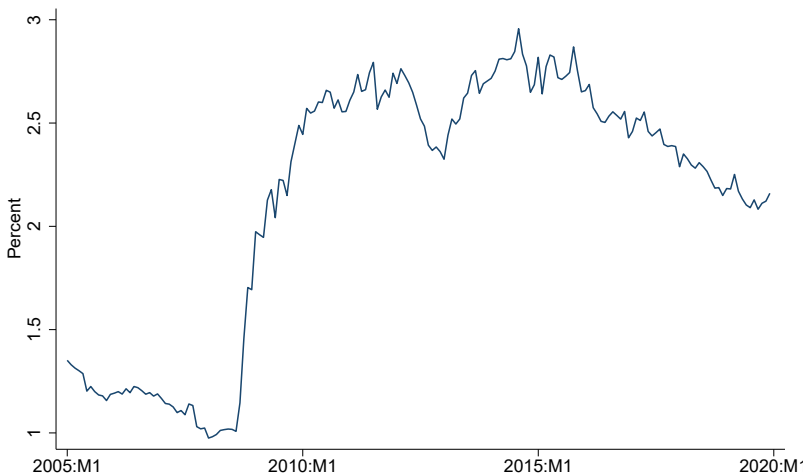
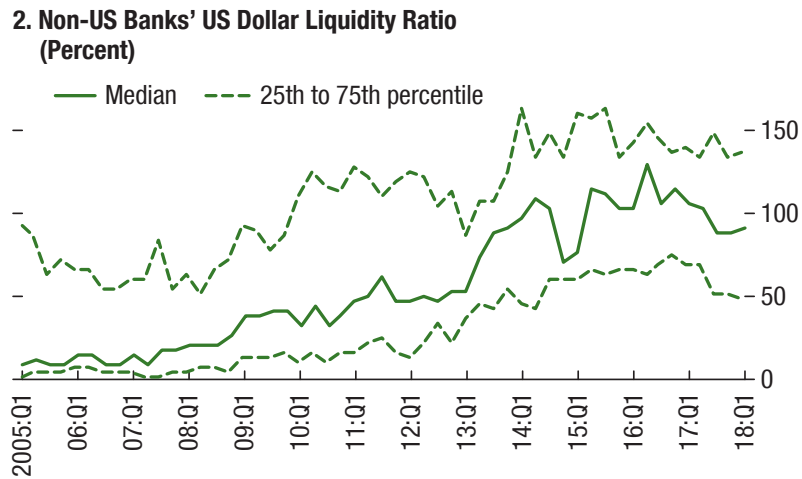
- Is it reasonable to use the dollar liquidity ratio of US banks and to assume that foreign liquidity ratios respond similarly?

Liquidity Ratios





(a) US Banks (b) Non-US Banks

Note: Right panel is from the IMF Global Financial Stability Report (Oct 2019).

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Relationship of change of exchange rates and banking liquidity

	CAD	CHF	EUR	GBP	JPY	NOK	SEK
ΔLiqRat_t	0.155^{*}	0.103^{**}	0.177^{***}	0.220^{***}	-0.157^{***}	0.226^{**}	0.194^{**}
	(1.838)	(2.130)	(3.221)	(4.232)	(−3.517)	(2.495)	(2.434)
$\pi_t - \pi_t^*$	−0.003	−0.004	-0.007^{***}	−0.003	0.000	0.000	−0.002
	(−1.082)	(−1.565)	(−3.103)	(−1.575)	(0.392)	(0.062)	(−1.309)
LiqRat_{t-1}	0.008	0.002	0.009^{*}	0.003	0.002	0.004	0.003
	(1.549)	(0.361)	(1.849)	(0.522)	(0.363)	(0.721)	(0.627)
constant	−0.006	−0.009	-0.009^{**}	0.000	0.000	−0.002	−0.003
	(−1.387)	(−1.368)	(−2.090)	(0.016)	(0.020)	(−0.337)	(−0.607)
N	180	180	180	180	180	180	180
adj. R^2	0.07	0.02	0.11	0.12	0.05	0.09	0.06

- Good news: Results are qualitatively similar for a lot of other currencies
- Bad news: Opposite sign for JPY. Is this variable really picking up risk premia and not just "pure" liquidity? Can adding risk aversion to the model generate this interaction between liquidity premia and currency risk properties?

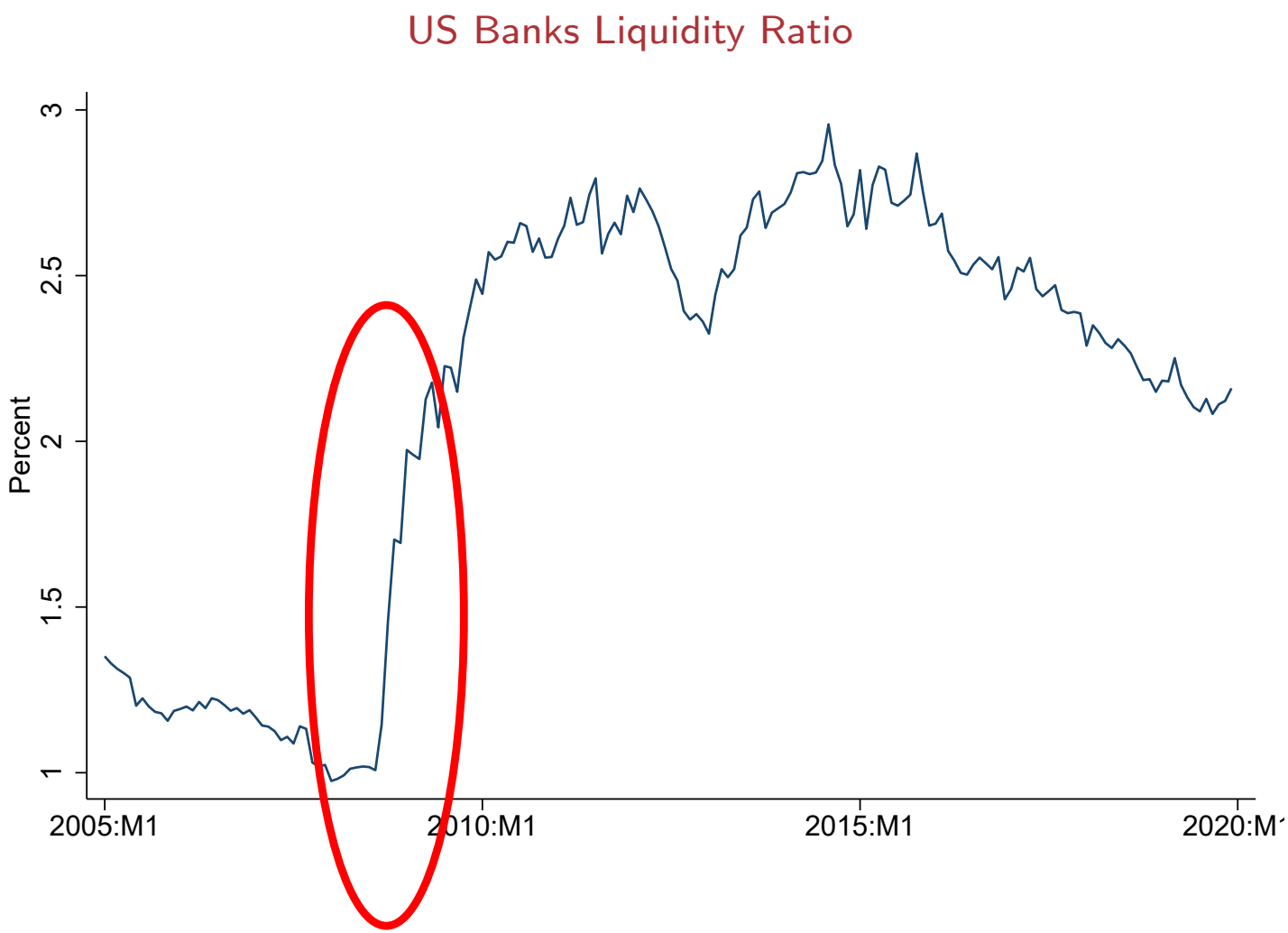
Liquidity ratios and premia

This liquidity measure is related to convenience yields (downloaded from Du, Im, and Schreger (2020)) in the direction indicating mainly fluctuations in dollar payment volatility (of shocks considered), even for the JPY.

Relationship of change of convenience yield and banking liquidity

	CAD	CHF	EUR	GBP	JPY	NOK	SEK
ΔLiqRat_t	246.756^{***}	1.783	222.860^{***}	180.868^{***}	217.984^{***}	489.770^{***}	221.080^{***}
	(3.356)	(0.016)	(3.576)	(3.016)	(2.822)	(3.619)	(2.960)
constant	11.812^{***}	42.359^{***}	18.613^{***}	0.462	43.888^{***}	8.997^{***}	6.045^{***}
	(9.522)	(23.914)	(15.210)	(0.437)	(27.995)	(4.347)	(2.875)
N	174	180	180	180	179	180	180
adj. R^2	0.22	−0.01	0.19	0.16	0.12	0.28	0.07

Influential jump



Influential jump

Excluding this large jump dramatically weakens the relationship with exchange rates.

Relationship of change of exchange rates and banking liquidity, without 2008:M9–2008:M11

	CAD	CHF	EUR	GBP	JPY	NOK	SEK
ΔLiqRat_t	0.034	0.044	0.073	0.120^{**}	-0.106^{*}	0.046	0.019
	(0.645)	(0.694)	(1.282)	(2.292)	(−1.900)	(0.757)	(0.308)
$\pi_t - \pi_t^*$	−0.002	-0.004^{*}	-0.007^{***}	-0.004^{**}	0.001	−0.000	-0.004^{**}
	(−1.042)	(−1.661)	(−3.149)	(−2.094)	(0.469)	(−0.334)	(−2.101)
LiqRat_{t-1}	0.010^{*}	0.003	0.011^{**}	0.006	0.001	0.010^{*}	0.009^{*}
	(1.863)	(0.614)	(2.417)	(1.257)	(0.131)	(1.675)	(1.678)
constant	-0.008^{*}	−0.011	-0.011^{***}	−0.003	0.001	−0.006	-0.009^{*}
	(−1.723)	(−1.635)	(−2.677)	(−0.753)	(0.236)	(−1.359)	(−1.789)
N	177	177	177	177	177	177	177
adj. R^2	0.01	0.01	0.06	0.04	0.00	0.00	0.01

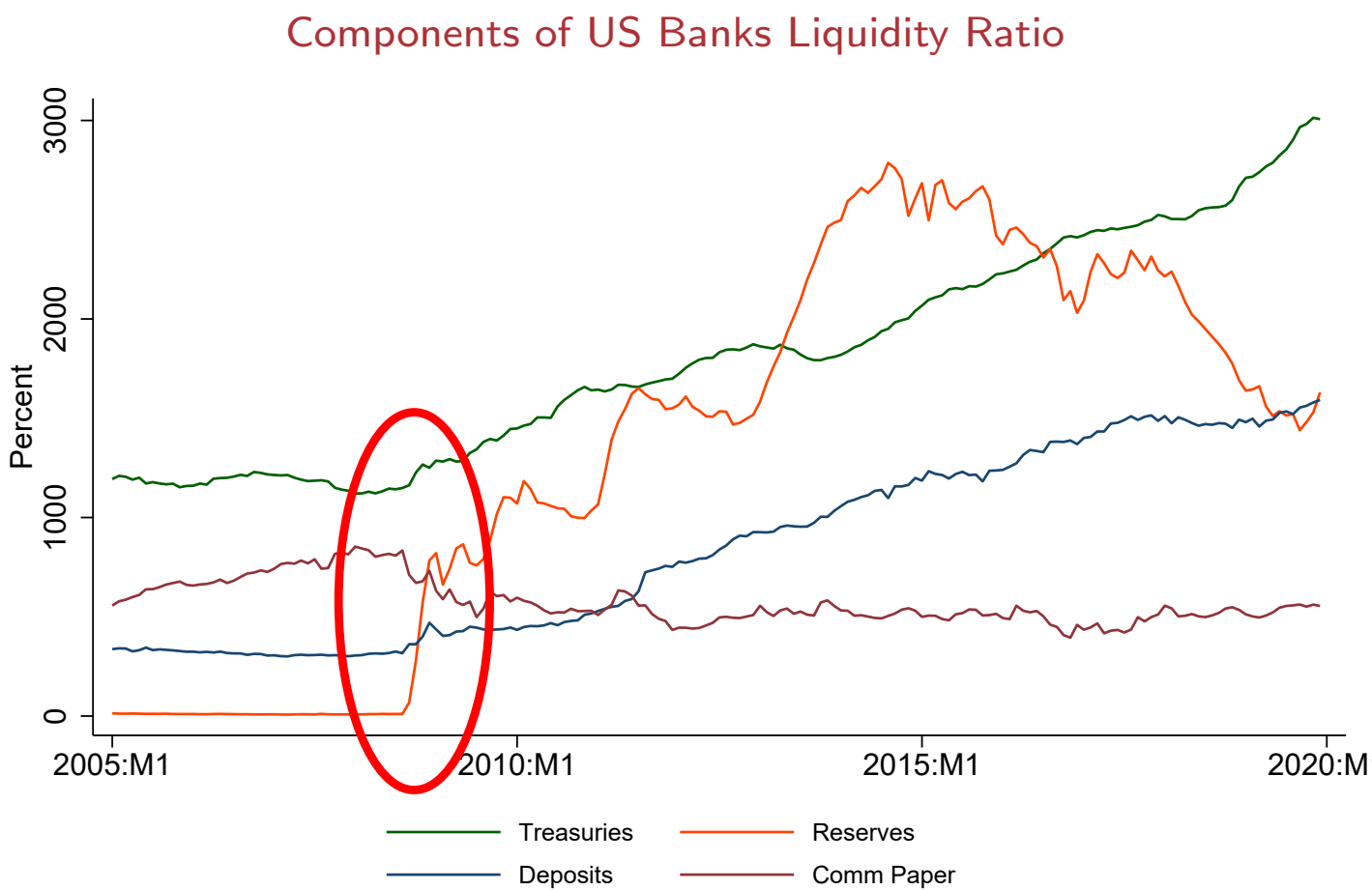
Influential jump

The relationship with convenience yields is also greatly weakened without this jump.

Relationship of change of convenience yield and banking liquidity, without 2008:M9–2008:M11

	CAD	CHF	EUR	GBP	JPY	NOK	SEK
ΔLiqRat_t	82.008	8.861	61.658	61.773	37.087	208.361**	53.106
	(1.317)	(0.140)	(1.241)	(1.294)	(0.651)	(1.998)	(0.705)
constant	10.934***	42.246***	17.716***	−0.289	42.791***	7.699***	5.130**
	(9.744)	(25.155)	(15.968)	(−0.300)	(29.953)	(4.145)	(2.505)
N	171	177	177	177	176	177	177
adj. R^2	0.02	−0.01	0.01	0.01	−0.00	0.05	−0.00

Influential jump



Better isolating the mechanism?

- Could this jump just be the only prominent dollar payment volatlity shock in the sample?
- Perhaps mechanism is present in other periods, but is obscured in reduced-form regressions by other shocks, including some not considered in the model.
- Are there ways to isolate variation from precautionary liquidity demand in the rest of the sample?
  - Plausible instrumental variables?
  - Using events and higher frequency data:
    This is where a focus on liquidity premia versus ratios can help, but there is also some higher frequency regulatory data on quantities. Correa, Du, Liao (2020)

Conclusion

- Nice illustration of a very plausible mechanism by which liquidity concerns affect the value of the dollar
- Current results are encouraging, but there's still some room for improvement in the empirical measurement of this mechanism