

Mind the Gap in Sovereign Debt Markets: The U.S. Treasury basis and the Dollar Risk Factor

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Abstract

The U.S. dollar exchange rate clears the global market for dollar-denominated safe assets. We find that shifts in the demand and supply of safe dollar assets are important drivers of variation in the dollar exchange rate, bond yields, and other global financial variables. An increase in the convenience yield that foreign investors derive from holding safe dollar assets causes the dollar to appreciate, and incentivizes foreign debtors to tilt their issuance towards dollar-denominated instruments. U.S. monetary policy also affects the dollar exchange rate through its impact on the supply of safe dollar assets and the convenience yield. Interest rate spreads with foreign countries are not sufficient statistics to gauge the impact of the stance of U.S. monetary policy on currency markets. The U.S. Treasury basis, which measures the yield on an actual U.S. Treasury minus the yield on an equivalent synthetic U.S. Treasury constructed from a foreign bond, provides a direct measure of the global scarcity of dollar safe assets.

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		dollar-weighted	buy-and-hold	gap
Treasurys	nominal USD	5.46%	10.33%	4.87%
	Local currency	5.43%	13.74%	8.32%

Table 1: Dollar-weighted Returns earned by Foreign Investors on net purchases of U.S. Treasurys. Sample: 1980.01-2019.02. TIC Treasury data on net purchases of U.S. Treasurys by foreigners. We assume these flows are fully invested in the Barclays Treasury Bond Index. We used the Federal Reserve’s dollar exchange rate index to convert dollar returns into local currency returns. The dollar-weighted return is the IRR realized on the cash flows invested by foreign investors. The terminal cash flow is the market value of the foreign investor’s Treasury holdings. The buy-and-hold return is the geometric mean.

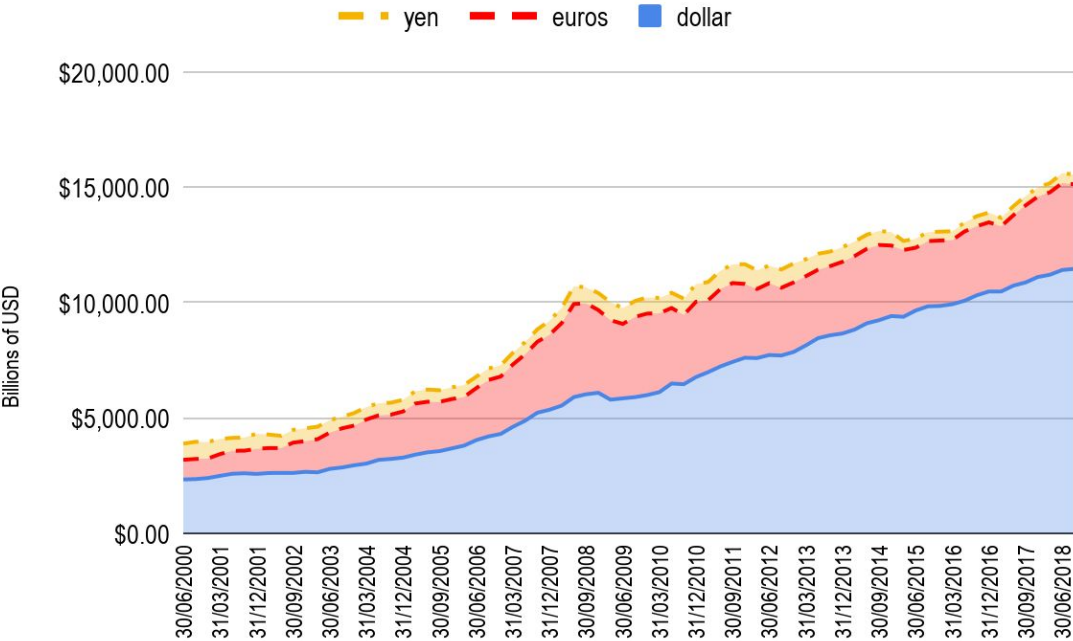


Figure 1: Non-resident Non-bank Holdings of Credit Instruments by Currency Denomination. Source BIS Statistics. Table E2. Total Credit to Non-bank Borrowers.

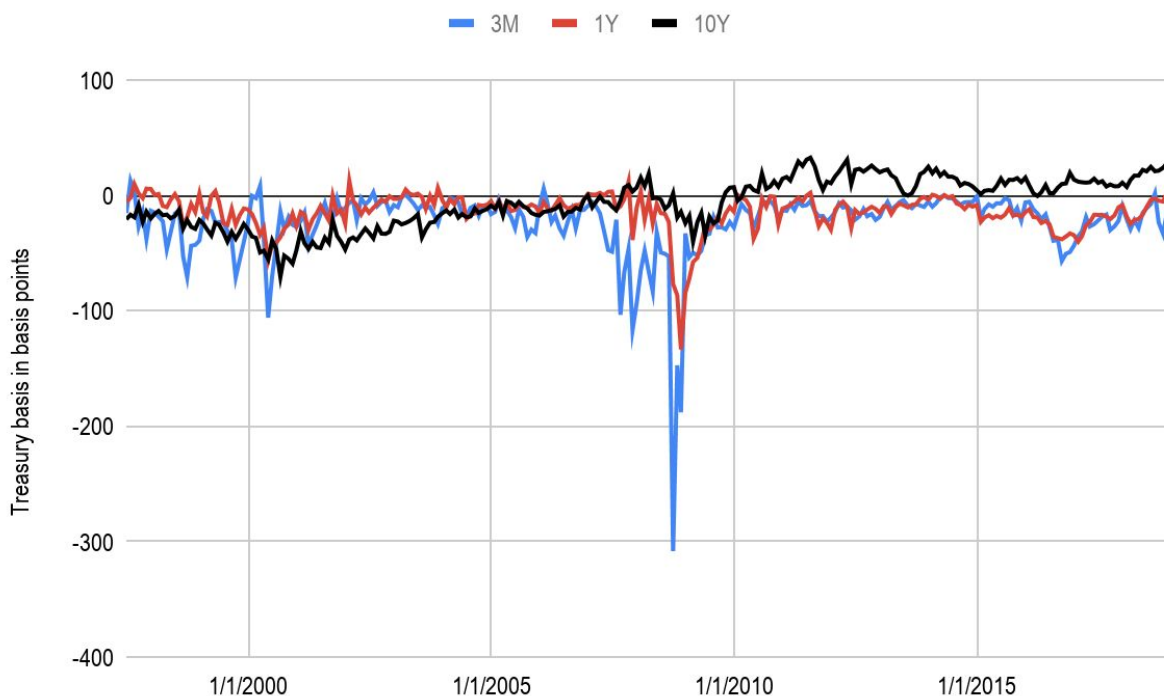


Figure 2: Average U.S Treasury basis against G10 currencies. The average was constructed by computing an equally weighted average of all 9 bilateral Treasury bases.

The Treasury basis measures the yield on an actual U.S. Treasury minus the yield on an equivalent synthetic U.S. Treasury constructed from a foreign bond with the same maturity by hedging the currency risk.

The dollar exchange rate reflects the cumulative value of all (1) future convenience yields λ , (2) future yield differences, less the (3) future currency risk premia RP_t .

$$s_t = \mathbb{E}_t \sum_{\tau=0}^{\infty} \lambda_{t+\tau}^* + \mathbb{E}_t \sum_{\tau=0}^{\infty} (y_{t+\tau}^{\$} - y_{t+\tau}^*) - \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(RP_{t+\tau}^* - \frac{1}{2} \text{Var}_{t+\tau}[\Delta s_{t+\tau+1}] \right) + \mathbb{E}_t \left[\lim_{\tau \rightarrow \infty} s_{t+\tau} \right].$$

		3M	1Y	2Y	3Y	5Y	7Y	10Y
G10	whole	-0.09	-0.27	-0.31	-0.37	-0.36	-0.25	-0.26
	pre-crisis	-0.06	-0.06	-0.14	-0.19	-0.20	-0.23	-0.28
	post-crisis	-0.41	-0.41	-0.41	-0.48	-0.49	-0.27	-0.25
emerging	whole	-0.12	-0.30	-0.34	-0.38	-0.42	-0.26	-0.23
	pre-crisis	-0.10	-0.10	-0.24	-0.15	-0.33	-0.21	-0.22
	post-crisis	-0.39	-0.39	-0.36	-0.46	-0.48	-0.29	-0.24

Table 2: Correlation between change in U.S. Treasury basis and dollar. Sample for dollar index against G10 currencies: Monthly data from 1997/06/30 to 2019/01/31. The pre-crisis sample is defined as 1997/06/30 to 2007/12/31. The post-crisis sample is 2008/01/31 to 2019/01/31. Dollar index constructed by averaging all G-10 log bilateral exchange rates against the dollar. Sample for dollar index against emerging market currencies starts only in 2001/01/31.

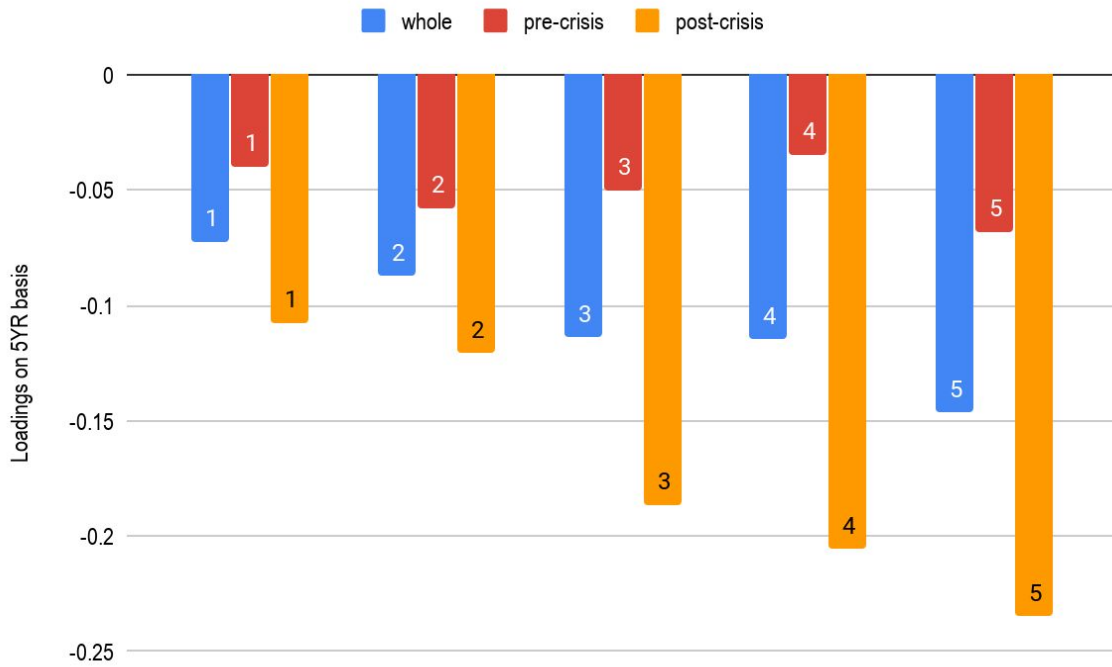


Figure 3: Currency Carry Portfolio loadings on change in 5YR Treasury basis. Loadings on change in 5YR basis for (absolute value) for 5 Currency Carry Portfolios constructed by sorting currencies into portfolios based on 3M forward discount (Lustig et al. 2011). Monthly data from 1997/06/30 to 2019/01/31. The pre-crisis sample is defined as 1997/06/30 to 2007/12/31. The post-crisis sample is 2008/01/31 to 2019/01/31.

		3M	1Y	2Y	3Y	5Y	7Y	10Y
		1st stage: basis on FFR surprise						
Kuttner	coeff	-31.867	-16.888	-36.288	-30.039	-36.202	-41.825	-31.071
	se	15.454	7.318	6.622	6.419	6.219	5.850	5.392
	R ²	0.041	0.051	0.231	0.180	0.253	0.338	0.249
		2nd stage: FX on basis and ydiff						
IV (Δ US basis)	coeff	-0.075	-0.083	-0.062	-0.077	-0.065	-0.063	-0.080
	se	0.028	0.048	0.022	0.026	0.021	0.018	0.025
Δ ydiff	coeff	-0.013	3.701	1.625	0.903	2.479	2.661	2.733
	se	0.753	1.109	1.108	1.135	1.139	0.944	1.189
	R ²	0.085	0.177	0.104	0.091	0.127	0.153	0.131

Table 4: Regression of changes in dollar index (G-10) on FOMC-induced variation in U.S. Treasury basis. 1st stage regression of change in basis on Kuttner surprise. 2nd stage regression of change in dollar index on IV (fitted change in basis from 1st stage) and change in yield difference. 102 FOMC meetings between Jan 1997 and Dec 2008. We include the event day and define the change in the basis (Δ Basis) and the change in the dollar from the close of trading on the day prior to the event day to the close of trading x days later.

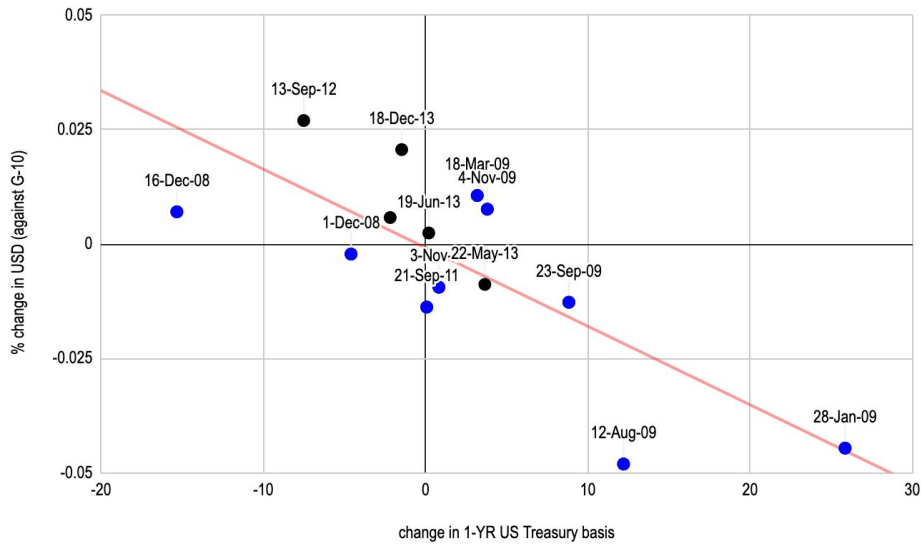


Figure 4: G-10 Dollar appreciation against change in basis around QE event dates. Sample of 14 QE event dates. 2-day window after QE-event dates. We include the event day and define the change in the basis (Δ Basis) and the change in the dollar from the close of trading on the day prior to the event day to the close of trading x days later.

		3M	1Y	2Y	3Y	5Y	7Y	10Y
Δ U.S. basis	coeff	-0.247	-0.166	-0.240	-0.225	-0.170	-0.189	-0.152
	s.e.	0.057	0.028	0.035	0.037	0.034	0.047	0.050
Δ ydiff	coeff	20.012	31.381	17.501	16.338	12.568	12.857	11.231
	s.e.	9.066	8.031	3.092	2.951	2.610	2.624	3.195
	R ²	0.637	0.828	0.837	0.800	0.751	0.697	0.563

Table 5: Regression of changes in dollar (G-10) on QE-induced changes in U.S. Treasury basis and changes in yields. We include 14 QE event dates. We include the event day and define the change in the basis (Δ Basis) and the change in the dollar from the close of trading on the day prior to the event day to the close of trading x days later.