Discussion of Maggiori ‘US Dollar Safety Premium’

Richard Clarida
C. Lowell Harriss Professor of Economics
Columbia University

What is the USD Safety Premium?

Why do we Care?

How do we estimate it?

What are the Results?

Should we Believe the Results?

USD safety Premium is just the expected excess return on a short USD currency carry trade

$$\$SP_t \equiv r^*_{f,t+1} + E_t[\Delta e_{t+1}] - r_{f,t+1} + \frac{1}{2}Var_t(\Delta e_{t+1}) = -Cov_t(m_{t+1}, \Delta e_{t+1}).$$

If on average this return is positive it must be so, according to asset pricing theory, because in ‘rare’ bad states of world when consumption is low (the stochastic discount factor is high) the dollar appreciates.

We care because the safety premium is a priced factor that can be reflected in many internationally traded assets.

$$E_t[r^*_{t+1} + \Delta e_{t+1} - r_{t+1}] + \frac{1}{2}Var_t(r^*_{t+1} + \Delta e_{t+1}) - \frac{1}{2}Var_t(r_{t+1}) =$$
$$\underbrace{-Cov_t(m^*_{t+1}, r^*_{t+1}) + Cov_t(m_{t+1}, r_{t+1})}_{domestic\ risk} \underbrace{+Cov_t(r^*_{t+1}, \Delta e_{t+1}) - Cov_t(m_{t+1}, \Delta e_{t+1})}_{exchange\ rate\ risk}.$$

Paper estimates it using the Classic Campbell (1987) method in 3 stages assuming the return on world equity market is the stochastic part of the stochastic discount factor *m* $_{t,t+1}$

Stage 0

$$r_{t+1} = \alpha_r Y_t^r + \epsilon_{t+1}^r;$$
$$\Delta e_{t+1} = \alpha_e Y_t^e + \epsilon_{t+1}^e.$$

Stage 1

$$\widetilde{Cov}(r_{t+1}, \Delta e_{t+1}) = \alpha_z Z_t + \xi_{t+1};$$

Stage 2

$$r_{f,t+1}^* + \Delta e_{t+1} - r_{f,t+1} + \frac{1}{2}\widetilde{Var}(\Delta e_{t+1}) = d_0 + [d_1 \qquad]\widetilde{Cov}(r_{t+1}, \Delta e_{t+1}) + \omega_{t+1},$$

Done jointly via GMM (Campbell and Clarida (1987) early application to fx). Model is exactly identified so can't be tested. Interpret correlation between realized returns on short USD carry trade and the forecast able covariance between global equity returns and the value of the dollar.

Question: Paper reports that loadings on the instruments in first stage regression are significant, but how well do these projections fit?

Table 3: First Stage Regressions

Panel A: Exploring covariance predictability						
	World			Developed		
Instruments	$F-Stat$	χ^2-Stat	$\chi^2\ p-val$	$F-Stat$	χ^2-Stat	$\chi^2\ p-val$
All	15.76	94.56	(0.0000)	15.38	92.29	(0.0000)
ex dp ratio	14.03	70.16	(0.0000)	13.18	65.88	(0.0000)
ex covariance	17.10	85.52	(0.0000)	15.65	78.27	(0.0000)
ex volatilities	5.12	20.46	(0.0004)	4.11	16.42	(0.0025)
ex return & exch. rate chg.	19.70	78.78	(0.0000)	19.15	76.61	(0.0000)
cum int. diff.	14.12	98.85	(0.0000)	13.49	94.44	(0.0000)
Panel B: Details						
	World			Developed		
	$Coeff. \times 10^4$	χ^2-Stat	$\chi^2\ p-val$	$Coeff. \times 10^4$	χ^2-Stat	$\chi^2\ p-val$
int. diff.	-0.60	1.20	(0.2725)	-0.44	0.45	(0.5021)
	-[1.10]			-[0.67]		

In other words how predictable a month in advance is this covariance? Weak instruments?

Question: Paper reports that loading on the instrumented covariance is significant, but how well does this projection fit?

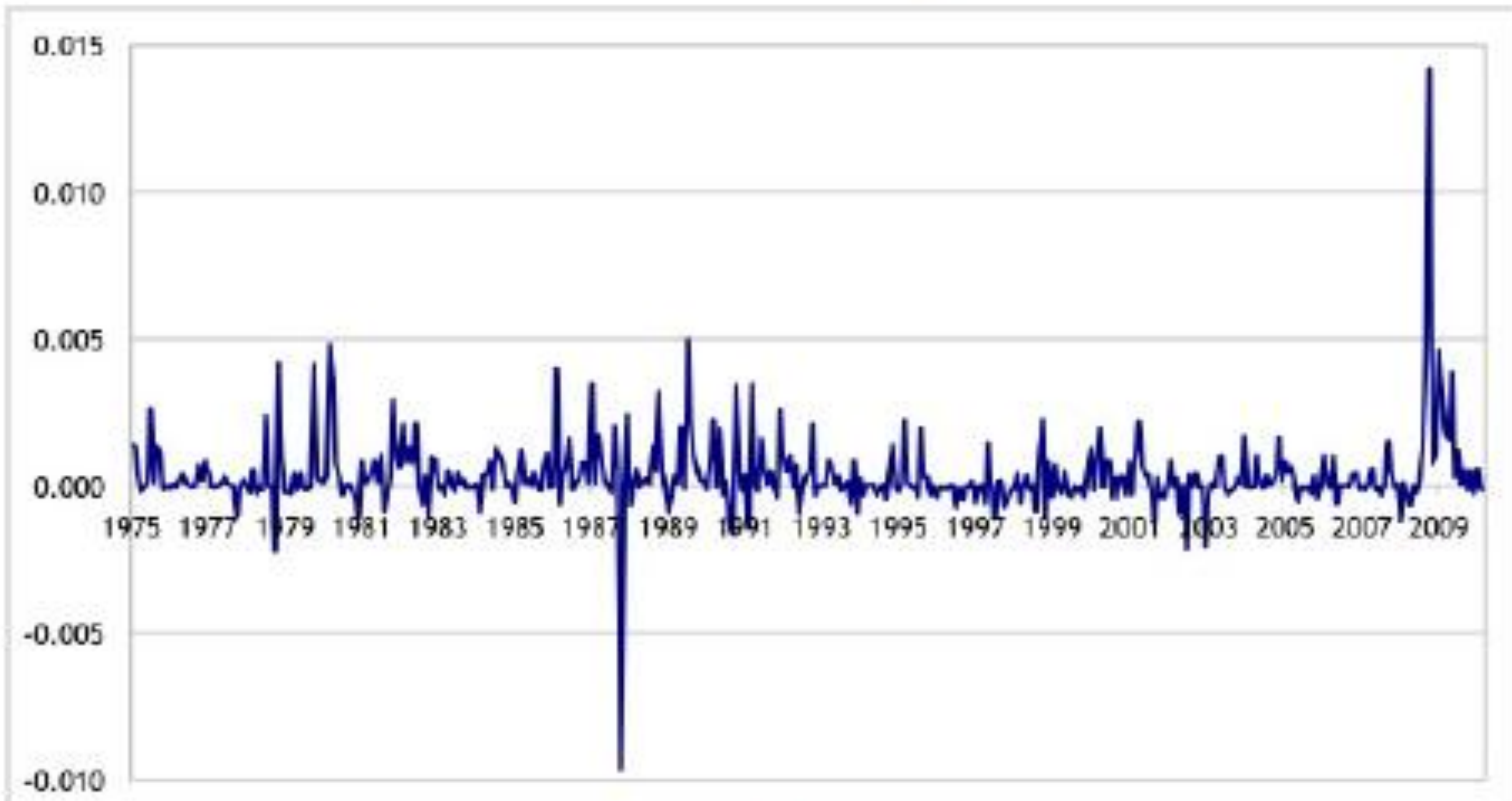
Table 5: Second Stage Regressions

	World		*Developed*	
	d_0	d_1	d_0	d_1
All	-0.0028	12.0672	-0.0031	12.4887
	-[1.45]	[3.19]	-[1.51]	[3.17]
ex dp ratio	-0.0042	16.3391	-0.0041	15.4557
	-[1.59]	[2.55]	-[1.55]	[2.46]
ex covariance	-0.0031	13.1771	-0.0035	13.7937
	-[1.56]	[3.16]	-[1.64]	[3.14]
ex volatilities	-0.0005	3.6559	-0.0006	3.8685
	-[0.22]	[0.82]	-[0.27]	[0.79]
ex return & exch. rate chg.	-0.0009	4.6295	-0.0012	5.6272
	-[0.44]	[1.07]	-[0.54]	[1.21]
cum int. diff.	0.0001	10.2047	0.0006	9.4118
	[0.03]	[2.54]	[0.34]	[2.28]

We know from Table 2 (and many other papers) carry trade returns over short horizons are very hard to forecasts based on interest differentials alone. So how about with the fitted covariance as a regressor?

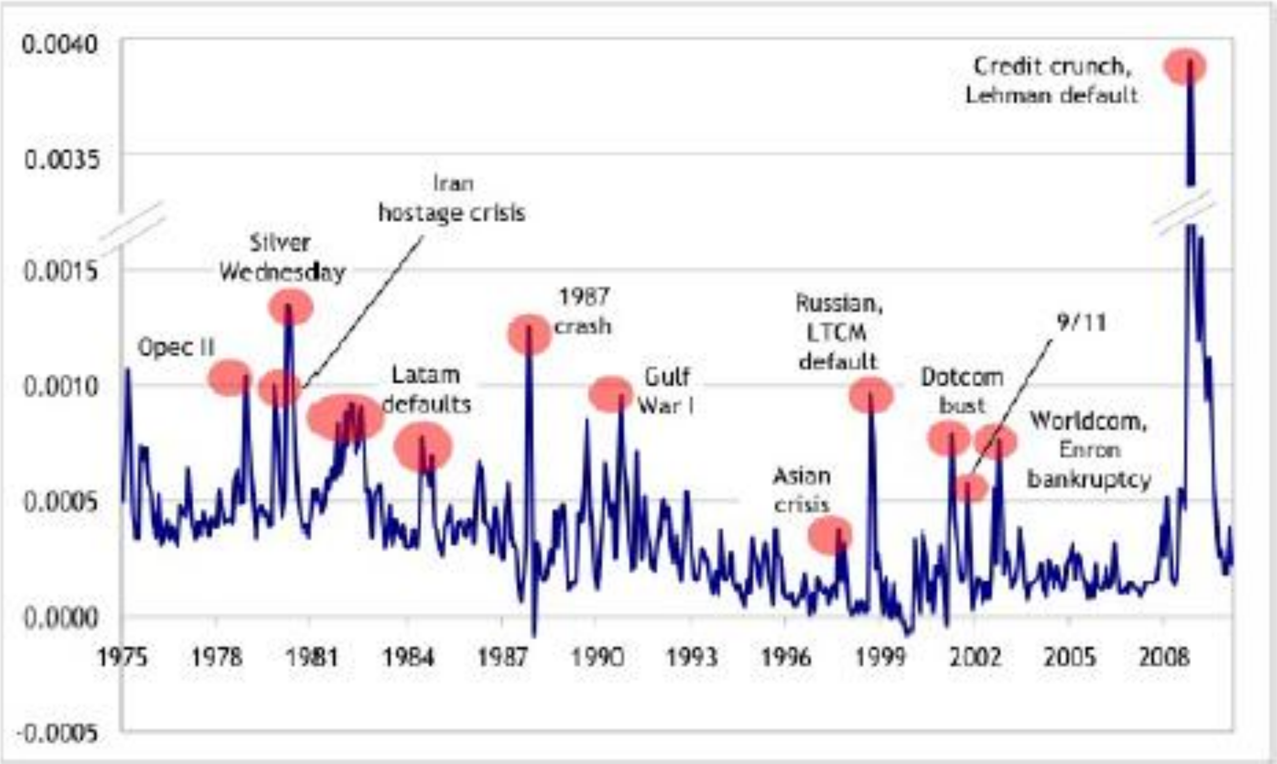
Realization of the Stochastic Discount Factor

Figure 6: Ex Post Covariance $\widetilde{Cov}(r_{t+1}, \Delta e_{t+1})$: World Index



Projection of SDF on Instruments

Figure 8: Conditional Covariance $\widehat{Cov}(r_{t+1}, \Delta e_{t+1})$: World Index



So this is Nice and the key results: Bad times in Global stocks are indeed times when the dollar appreciates: and not just Lehman!

The USD Safety Premium

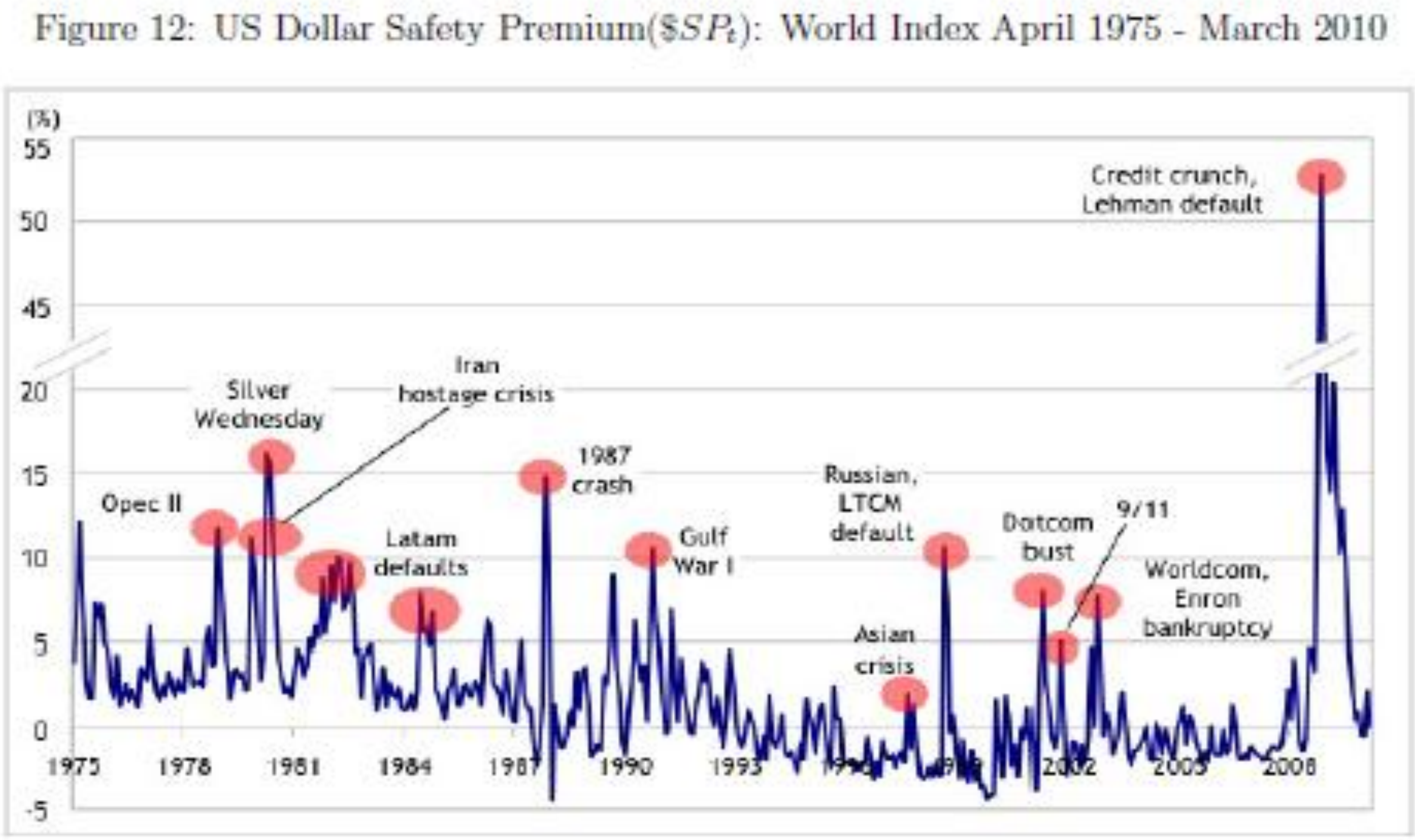


Figure 8 Multiplied by d_1 = 12.067 from Table 5

So Is There a Dollar Safety Premium?

YES

Is this the whole story of carry trade alpha?

AN IMPORTANT PART OF STORY BUT NOT ALL OF IT.

What is left out?

CARRY TRADES LOSE MONEY WHEN FORECASTABLE/IMPLIED VOL (OF FX OR EQUITY) IS HIGH, WHEN ‘LEVEL’ YEILD CURVE FACTOR SHIFTS DOWN, WHEN ‘SLOPE’ YIELD CURVE FACTOR STEEPENS. (Clarida, Davis, Pedersen (2009)). BUT THESE ARE LIKELY ALSO OFTEN TIMES WHEN THE FORECASTABLE COVARIANCE IS HIGH. WORTH DOING MORE WORK BEYOND JUST A SINGLE EQUITY FACTOR.

Relationship between USD Safety Premium and inflation indexed bond yield differentials (Clarida (2012;2013))

Define $\exp \vartheta_{t,n}$ *as the ratio of the expected real return on the foreign linker to the known return on the US TIP*

$$\exp \vartheta_{t,n} \equiv E_t\, RR^{hf}_{t,n}/RR^{hh}_{t,n} = (\exp nr^*_{t,n} / \exp nr_{t,n})\; Q/Q_t$$

Let Q denote the unconditional mean of the real exchange rate $Q_t = E_t P^*_t / P_t$ and assume that $E_t Q_{t+n} \approx Q$ for large n.

$$\sum_{i=0}^{n} {}_t\$SP_{t+i,1} \approx \theta_{t,n} + n(r_{t,n} - r^*_{t,n}) - \sum_{i=0}^{n} ({}_t er_{t+i,1} - {}_t er^*_{t+i,1})$$

Where $er_{t,1}$ is the ex ante real interest rate on a nominal 1 period bond. There is a tight conection between the expected sum of current and future USD safety premiums and the relative risk premium on foreign versus US inflation indexed bonds (after adjusting for the level of the real exchange rate).

Nice Paper!

"The Term Structure of Euromarket Interest Rates: An Empirical Investigation," (with John Y. Campbell), *Journal of Monetary Economics*, 19, January, 1987, 25-44.

"Currency Carry Trades: Beyond the Fama Regression" (with Josh Davis and Niels Pedersen), *Journal of International Money and Finance*, December 2009.

"Get Real: Interpreting Nominal Exchange Rate Fluctuations," *International Journal of Central Banking,* January 2012.

"Hot Tip: Nominal Exchange rates and Inflation Indexed Bond Yields," NBER Working Paper #18726, January 2013.