US Wealth Shares, the Dollar and Global Risk Premia

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Outline

1. Motivation
2. Framework
3. Stylised Facts
4. Mechanism
5. Theory
6. Empirical Appendix
7. Model Appendix

Motivation

EP: Theory explains the link between the US wealth share, the dollar and global risk premia through a ***risk sharing mechanism*** (Maggiori, 2017)

Overview: Due to greater risk bearing capacity, the US holds a wealth portfolio that longs global risky assets and shorts dollar safe assets. Thus:

1. **US Wealth Share**: Since US insures ROW during global recessions, *US wealth share should be* ***procyclical*** *w.r.t global economy*
2. **Global Risk Premia**: Since ROW is *more* risk averse, *global risk premia should be* ***countercyclical*** *w.r.t global economy*
3. **Dollar**: Due to wealth effects associated with falling US wealth share, *dollar strength should be* ***procyclical*** *w.r.t global economy*

Bottom Line: Central to these joint dynamics is the prediction of a ***procyclical*** *US wealth share*

Countercyclical US Wealth Share

Fact: US wealth share is ***countercyclical*** *w.r.t the global economy*: Global recessions are associated with ***rises***, *not falls, in US relative wealth*.

Mechanism: What drives the countercyclical US wealth share? I establish two crucial components to the underlying mechanism:

1. **Valuation Channel**: *Valuation forces*, not *flow* forces are key
2. **Equities**: Valuation channel driven by ***risky asset markets****: relative US equity outperformance during global recessions drives the countercyclical US wealth share*.

Bottom Line: These facts challenge EP theory: countercyclical US wealth share challenges view that US insures ROW (Maggiori, 2017)

Theory Resolution

Question: How to rationalise the countercyclical US wealth share alongside traditional countercyclical dynamics for dollar and global risk premia?

Resolution: ***Risk premia****, not risk sharing, is the key economic force driving these international asset pricing dynamics.*

1. **Global Risk Premia**: If US loads less on the global factor structure in equity prices, *US risk premia rises relatively less during global recessions*.
2. **Wealth Share**: Since US risk premia rises less during global recessions, $r_t^{US} - r_t^{ROW} \uparrow$, mapping directly into ***rising*** *US wealth share*
3. **Dollar**: Wealth effects associated with $\uparrow \omega_t^{US}$ generates a powerful dollar *appreciation* force during global recessions.

Model: I make this case using a two country, two-good model with recursive preferences, frictionless markets, and het global shock exposures.

Related Literature

Overview: My paper makes contact with two literatures in int macro-finance:

1. **Exorbitant Privilege (EP)**: Risk sharing view of international dynamics
   - **Theory**: Gourinchas and Rey (2007a); Gourinchas et al (2010); Gourinchas et al (2017); Maggiori (2017)
   - **New Facts**: Chen (2020); Atkeson, Heathcote and Perri (2021);
2. **EZ**: Explain int dynamics using recursive framework:
   - **Old Facts**: Colacito and Croce (2011, 2013); Colacito et al (2018a); Bansal and Shaliastovich (2013)
   - **New Facts**: Dou and Verdelhan (2015); Colacito et al (2021); Sauzet (2021)

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Empirical Framework

Overview: To construct my measure of the US wealth share, I map my empirical analysis to a bilateral framework with two countries: US and ROW.

ROW: I collapse non-US world into a single investor country (ROW). This includes 27 Developed countries.

Wealth Portfolios: Each country's wealth portfolio is invested across four assets: US equities, ROW equities, US bonds and ROW bonds:

$$\mathcal{W}_t^i = \underbrace{\mathcal{Q}_{US,t}^{E,i} + \mathcal{Q}_{ROW,t}^{E,i}}_{Equities} + \underbrace{\mathcal{Q}_{US,t}^{D,i} + \mathcal{Q}_{ROW,t}^{D,i}}_{Bonds}, i \in \{US, ROW\} \quad (1)$$

$\mathcal{Q}_{US,t}^{E,i}$: *Country i's holdings of US equities*
$\mathcal{Q}_{ROW,t}^{E,i}$: *Country i's holdings of ROW equities*
$\mathcal{Q}_{US,t}^{D,i}$: *Country i's holdings of US bonds*
$\mathcal{Q}_{ROW,t}^{D,i}$: *Country i's holdings of ROW equities*

US Wealth Share Measures

Wealth Share: ***US wealth share*** ω_t^{US} is defined as:

$$\omega_t^{US} = \frac{\mathcal{W}_t^{US}}{\mathcal{W}_t^{US} + \mathcal{W}_t^{ROW}} \tag{2}$$

Relative Wealth: ***US relative wealth*** $\tilde{\mathcal{W}}_t$ is defined as:

$$\tilde{\mathcal{W}}_t = \mathcal{W}_t^{US} - \mathcal{W}_t^{ROW} \tag{3}$$

Empirics: Due to persistence, I work with growth rates: $\Delta\omega_t^{US}, \Delta\tilde{\mathcal{W}}_t$

External Holdings Data

Source: External holdings are publicly observable via **US Treasury**. Two sets of official data:

1. **Treasury International Capital** (TIC) Survey
2. **Treasury SLT Form**

Time Series: Jan 1994 - Dec 2018.

1. **US**: Monthly *stock* dataset of US holdings of ROW Equity + Debt ($\mathcal{Q}^{E,US}_{ROW,t}, \mathcal{Q}^{D,US}_{ROW,t}$)
2. **ROW**: Monthly *stock* dataset of ROW holdings of US Equity + Debt ($\mathcal{Q}^{E,ROW}_{US,t}, \mathcal{Q}^{D,ROW}_{US,t}$)

Asset Coverage: Portfolio equity and publicly issued bonds (Treasury, Agency, Corporate)

Internal Holdings Data

Estimation: Internal holdings $\mathcal{Q}^{E,i}_{i,t}$, $\mathcal{Q}^{D,i}_{i,t}$ backed out from market values:

$$\begin{aligned}
\mathcal{Q}^{E,US}_{US,t} &= \mathcal{Q}^{E}_{US,t} - \mathcal{Q}^{E,ROW}_{US,t} \\
\mathcal{Q}^{E,ROW}_{ROW,t} &= \mathcal{Q}^{E}_{ROW,t} - \mathcal{Q}^{E,US}_{ROW,t} \\
\mathcal{Q}^{D,US}_{US,t} &= \mathcal{Q}^{D}_{US,t} - \mathcal{Q}^{D,ROW}_{US,t} \\
\mathcal{Q}^{D,ROW}_{ROW,t} &= \mathcal{Q}^{D}_{ROW,t} - \mathcal{Q}^{D,US}_{ROW,t}
\end{aligned} \tag{4}$$

$\mathcal{Q}^{E}_{i,t}$: *Dollar market cap of country i's stock market*
$\mathcal{Q}^{D}_{i,t}$: *Dollar market value of country i's debt outstanding*

Data: I obtain market cap data from the following sources:

1. **Equities**: *Datastream* (MSCI Global ex US)
2. **Bonds**: *BIS* (International Debt Statistics)

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Fact 1a: US Wealth Share is countercyclical

Fact 1: US Wealth Share is countercyclical

Table: US Wealth Share and Global Economy

	Wealth Share: $\Delta\omega_t^{US}$			Relative Wealth: $\Delta\tilde{\mathcal{W}}_t$		
	Full	Pre-2007	Post-2007	Full	Pre-2007	Post-2007
Δc_t^G	−0.166***	−0.187**	−0.212**	−0.245**	−0.148**	−0.285***
	(0.053)	(0.090)	(0.089)	(0.092)	(0.071)	(0.090)
Dollar_t	-0.373***	-0.246*	-0.513***	-0.047***	-0.080***	-0.0149*
	(0.081)	(0.126)	(0.106)	(0.009)	(0.002)	(0.008)
Constant	0.008**	0.009	0.009**	0.008**	0.007	0.012**
	(0.003)	(0.007)	(0.004)	(0.004)	(0.004)	(0.005)
Observations	103	53	50	103	53	50
Adjusted R^2	0.220	0.121	0.322	0.240	0.103	0.385

Note: *p<0.1; **p<0.05; ***p<0.01

Description: Δc_t^G is a *GDP weighted average* of consumption growths. Dollar_t is the dollar carry trade return. Sample is from 1994Q1 - 2018Q4.

Interpretation: 1% decrease in Δc_t^G is associated with:

1. **US Wealth Share**: 16.6 basis pt *increase* in US wealth share growth
2. **US Relative Wealth**: 24.4 basis pt *increase* in US relative wealth growth

Fact 1a: US Wealth Share is countercyclical

Example: $\Delta c_t^G \downarrow 15\%$ during 2007-2008. Thus coefficients imply:

1. **US Wealth Share**: US wealth share growth $\Delta\omega_t^{US}$ increased by approximately 2.5% during this period
2. **US Relative Wealth**: US relative wealth growth $\Delta\tilde{\mathcal{W}}_t$ increased by approximately 3.74% during this period.

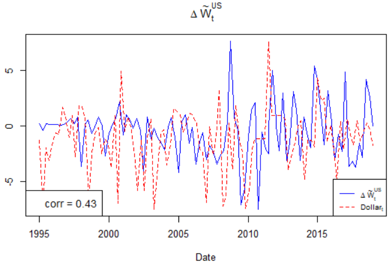
Interpretation: These magnitudes are modest but economically meaningful

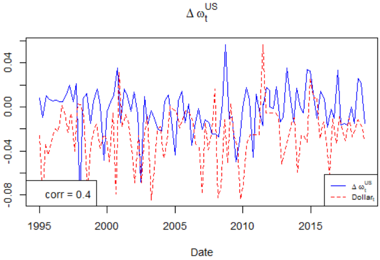
Bottom Line: *US gains relative wealth vis-á-vie the ROW during global recessions*.

▸ Robustness Checks

Fact 1b: US Wealth Share and Dollar

Description: This figure plots $\Delta\omega_t^{US}, \Delta\tilde{\mathcal{W}}_t$ (blue) against the dollar carry trade return (red).





Bottom Line: ***Rises*** *in US wealth share coincide with dollar* ***appreciations*** *against ROW.*

Fact 1C: US Wealth Share and Global Risk Premia

Overview: I regress log changes in various proxies for global uncertainty and global risk premia against US relative wealth growth $\Delta\tilde{\mathcal{W}}_t$.

	Panel A: Global Uncertainty Proxies			
	ΔIV_t^G	$\Delta Uncertainty_t$	ΔVIX_t	ΔRV_t^G
$\Delta\tilde{\mathcal{W}}_t$	0.028***	0.018**	0.023**	0.055**
	(0.009)	(0.007)	(0.010)	(0.025)
	(0.02)	(0.017)	(0.024)	(0.059)
Observations	93	103	103	103
Adjusted R^2	0.106	0.051	0.040	0.038
	Panel B: Global Risk Premia Proxies			
	ΔDEF_t	ΔGZ_t	ΔGFC_t	ΔRA_t
$\Delta\tilde{\mathcal{W}}_t$	0.033***	0.025***	-0.091***	0.018**
	(0.006)	(0.007)	(0.029)	(0.007)
Observations	103	103	103	103
Adjusted R^2	0.194	0.117	0.080	0.051
Note:	*p<0.1; **p<0.05; ***p<0.01			

Bottom Line: ***Rises*** *in US wealth share coincide with* ***rises*** *in global uncertainty and global risk premia.* Proxy Variable Descriptions

Summary So Far

Fact 1a: Countercyclical US Wealth Share

The US wealth share is ***countercyclical*** *w.r.t. the global economy: the US gains relative wealth vis-á-vie the rest of the world (ROW) during global recessions.*

Fact 1b: Joint Dynamics with Dollar and Global Risk Premia

rises in the US wealth share coincide with i) ***rises*** *in global risk premia, ii) systematic dollar* ***appreciations*** *against the ROW.*

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Mechanism

Comment: Stylised facts challenge EP theory: countercyclical US wealth share challenges view that US insures ROW (Maggiori, 2017)

Question: Digging deeper, what drives the countercyclical US wealth share?

Mechanism: I establish two crucial ingredients to the underlying mechanism:

1. **Valuation Channel**: *Valuation forces*, not *flow* forces drive US relative wealth changes (Fact 2A)
2. **US equities**: Valuation forces in ***risky*** *asset markets* are key (Fact 2B)

Bottom Line: US equity outperformance vis-á-vie the ROW during global recessions drives the countercyclical US wealth share.

Fact 2a: US Wealth Share and the Valuation Channel

Decomposition: To establish the dominance of valuation forces, I decompose aggregate wealth $\mathcal{W}_t^i$ into valuation and flow components: $\mathcal{V}_t^i$, $\mathcal{D}_t^i$:

$$\mathcal{W}_t^i = \underbrace{\mathcal{W}_{t-1}^i(\pi_{t-1}^{i\,\prime} r_t)}_{\mathcal{V}_t^i} + \mathcal{D}_t^i \tag{5}$$

This implies that ***US relative wealth changes*** $\Delta\tilde{\mathcal{W}}_t$ take the form:

$$\Delta\tilde{\mathcal{W}}_t = \underbrace{\Delta\mathcal{V}_t^{US} - \Delta\mathcal{V}_t^{ROW}}_{\Delta\tilde{\mathcal{V}}_t} + \underbrace{\Delta\mathcal{D}_t^{US} - \Delta\mathcal{D}_t^{ROW}}_{\Delta\tilde{\mathcal{D}}_t} \tag{6}$$

Variance Decomposition: This gives rise to the following variance decomposition:

$$var(\Delta\tilde{\mathcal{W}}_t) = var(\Delta\tilde{\mathcal{V}}_t) + var(\Delta\tilde{\mathcal{D}}_t) + 2cov(\Delta\tilde{\mathcal{V}}_t, \Delta\tilde{\mathcal{D}}_t) \tag{7}$$

Fact 2a: US Wealth Share and the Valuation Channel

Table: Variance Decomposition of $\Delta\tilde{\mathcal{W}}_t$

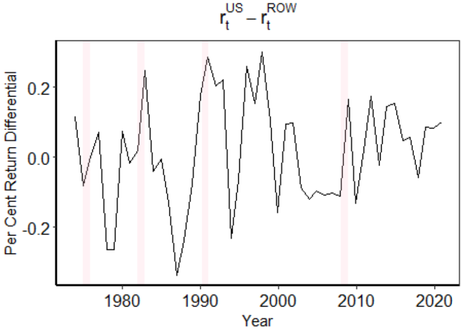
Sample	$\frac{var(\Delta\tilde{\mathcal{V}}_t)}{var(\Delta\tilde{\mathcal{W}}_t)}$	$\frac{var(\Delta\tilde{\mathcal{D}}_t)}{var(\Delta\tilde{\mathcal{W}}_t)}$	$\frac{2cov(\Delta\tilde{\mathcal{V}}_t,\Delta\tilde{\mathcal{D}}_t)}{var(\Delta\tilde{\mathcal{W}}_t)}$
Full Sample	0.741	0.309	-0.050
Pre 2007	0.817	0.128	0.055
Post 2007	0.727	0.343	-0.070

Takeaway: Valuation component $\Delta\tilde{\mathcal{V}}_t$ drive US relative wealth dynamics

▸ Valuation Channel and Global Economy

Fact 2b: Countercyclical US Equity Outperformance

Description: Pink bands corresponds to four global recessions: 1974Q1-1975Q1, 1981Q4-1982Q4, 1990Q4-1991Q1, and 2008Q3-2009Q1.



▸ US Equity Outperformance Regressions

Interpretation: US stock market outperforms ROW during global recessions.

Fact 2b: US Equity Outperformance

Table: *US Equity Outperformance and Valuation Channel*

	Dependent variable: $\Delta\tilde{\mathcal{V}}_t$					
	Full	Full	Pre-2007	Pre-2007	Post-2007	Post-2007
$r_t^{US} - r_t^{ROW}$	0.257***	0.286***	0.114***	0.144***	0.441***	0.479***
	(0.045)	(0.039)	(0.026)	(0.030)	(0.087)	(0.074)
Dollar_t		-0.230***		-0.112		-0.217
		(0.087)		(0.069)		(0.152)
Constant	-0.003***	-0.007***	-0.004***	-0.006***	-0.031***	-0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Observations	103	103	53	53	50	50
Adjusted R^2	0.376	0.434	0.285	0.346	0.543	0.577
Note:	$^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$					

Interpretation: US equity outperformance drives the valuation component, and consequently the countercyclical US wealth share

Bond Robustness Check

Fact 2b: US Equities and Valuation Channel

Fact 2a: Countercyclical US Wealth Share and Valuation Channel

Valuation forces, *not flow forces, drive the countercyclical US Wealth Share.*

Fact 2b: US Equities and Valuation Channel

Valuation channel driven by the ***relative outperformance of the US stock market vis***-á-***vie the ROW during global bad times.***

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Theory Perspective

Recap: I document a novel stylised fact: US wealth share is *countercyclical*: US gains relative wealth during global recessions:

1. **Mechanism**: These dynamics are driven by *countercyclical US equity outperformance vis-á-vie the ROW*
2. **US Wealth Share and Dollar**: These countercyclical US wealth share dynamics are accompanied by traditional countercyclical dollar dynamics

Comment: Resolution must explain why US stock market outperforms ROW during global bad times.

Resolution: I argue that ***risk premia****, not risk sharing, is the key economic force driving these international dynamics*.

Mechanism

Environment: Two country, two-good model with EZ preferences, frictionless markets and het global shock exposures:

1. **Global Shock Exposure**: US endowment loads *less* on global supply shocks
2. **Implication**: US risk premia rises less during global recessions

Mechanism: This ***risk premium channel*** can reproduce countercyclical US wealth share and countercyclical dollar dynamics:

1. **Wealth Share**: Since US risk premia rises less during global recessions, $r_t^{US} - r_t^{ROW} \uparrow$, mapping directly into ***rising*** *US wealth share*
2. **Dollar**: $\uparrow \omega_t^{US}$ generates a dollar *appreciation* force that overpowers the dollar *depreciation* force caused by the bad global supply shock.

Risk Premium Channel and Pareto Weights

Mechanism: Risk premium channel driven by home pareto weight S_t:

$$S_t = S_{t-1}(\mathcal{E}_t)^{-\phi} Y_t \tag{8}$$

$\mathcal{E}_t$: ROW consumption per US consumption

Y_t: Relative Consumption Ratio ($Y_t = \frac{C_t^F}{C_t^H}$)

ϕ: Elasticity of Substitution across Goods

Existence: To guarantee existence of equilibrium, I allow for *cointegration between US, ROW endowment processes* (Colacito and Croce, 2013; Colacito et al, 2021)

Solution: Approximate model to ***third order*** around symmetric steady state where $S_t = \overline{S} = 1$ (Colacito and Croce, 2013). Model Details

Baseline Calibration

Calibration: Baseline calibration is presented below:

Panel A: *Preference Parameters*

Parameter	Description	Value
γ	Relative Risk Aversion	7.5
ψ	Intertemporal Elasticity of Substitution	2
α	Home Bias Parameter	0.98
δ	Discount Factor	0.99
ϕ	Elasticity of Substitution across Goods	0.2

Panel B: *Endowment Parameters*

Parameter	Description	Value
τ_H	Home Endowment Exposure to Global Shock	0.5
τ_F	Foreign Endowment Exposure to Global Shock	1.5
μ	Mean Endowment Growth Rate	0.005
β	Cointegration Parameter	0.01

Simulated Regressions

Table: *Simulated Model Regressions*

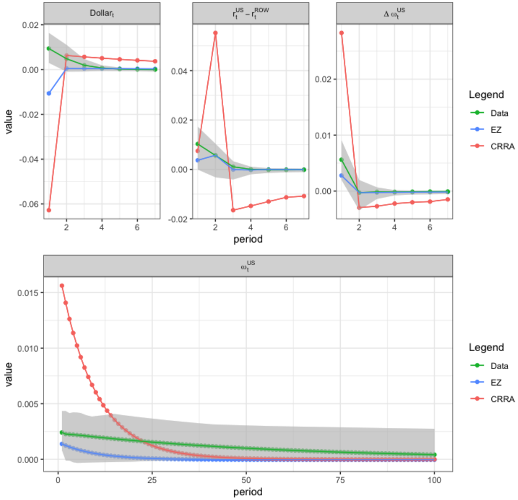
Description: The table reports the results from estimating the baseline wealth share regression and the US equity outperformance regressions using simulated data from the model. I report the simulated regression results for the baseline EZ model and the corresponding CRRA model.

	Dependent variable: $\Delta\omega_t^{US}$			*Dependent variable:* $r_t^{US} - r_t^{ROW}$		
	Data	EZ	CRRA	Data	EZ	CRRA
Δc_t^G	-0.166***	-0.365***	-7.901***	-0.400***	-0.780***	-7.201***
	(0.063)	(0.087)	(0.798)	(0.137)	(0.173)	(0.874)

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Model vs Empirical IRFs

Description: Model and Empirical IRFs to a 1 SD bad global shock:



Global Long Run Risks and Dollar Dynamics

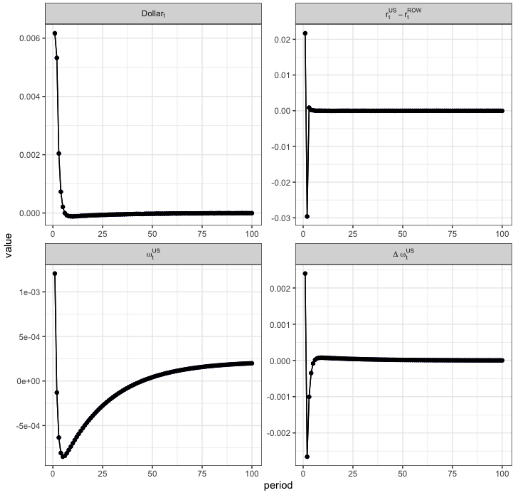
Big Picture: Model can reproduce wealth share dynamics well but falls prey to the infamous ***reserve currency paradox*** (Maggiori, 2017)

Resolution: I add a ***global*** *long run shock* $\xi^G_{x,t}$ to the endowment process for each country that is *positively* correlated with *contemporaneous global shock* Details

Bottom Line: With EZ preferences, $\xi^G_{x,t}$ generates an additional dollar appreciation force that allows model to reconcile both dollar and wealth share dynamics.

Global Long Run Risks and Reserve Currency Paradox

Description: Augmented Model IRFs to a 1 SD bad global shock:



Conclusion

Contribution: Paper explores the link between the US wealth share, the dollar and global economy:

1. **Empirical**: Uncover novel stylised facts regarding joint dynamics between US wealth share, the dollar and the global economy
2. **Theory**: Rationalise these facts using a two country, two-good model with Epstein and Zin preferences, frictionless markets, and het global shock exposures.

Big Picture: Observed joint dynamics are consistent with a recursive view of int asset pricing

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Robustness Checks

Regressions: I make sure that countercyclical US wealth share result is robust w.r.t:

1. **Dollar**: Dollar Robustness
2. **Policy Shocks**: US Policy Robustness

SVAR: I use an SVAR framework to evaluate response of US wealth share, dollar and global risk premia to bad global shocks:

1. **Just Dollar**: Baseline SVAR
2. **Dollar and Global Risk Premia**: Augmented SVAR

Return

Dollar Robustness

Description: η_t^{ω} and $\eta_t^{\mathcal{W}}$ are the orthogonalised component of $\Delta\omega_t^{US}$, $\Delta\tilde{\mathcal{W}}_t$ w.r.t the dollar respectively. The full sample is from 1994Q1 - 2018Q4.

	η_t^{ω}			$\eta_t^{\mathcal{W}}$		
	Full	Pre-2007	Post-2007	Full	Pre-2007	Post-2007
Δc_t^G	-0.165***	-0.175**	-0.189**	−0.181***	−0.138*	−0.245**
	(0.053)	(0.089)	(0.088)	(0.058)	(0.079)	(0.092)
Constant	0.009**	0.010	0.009**	0.008**	0.007	0.001**
	(0.003)	(0.007)	(0.004)	(0.004)	(0.005)	(0.005)
Observations	103	53	50	103	53	50
Adjusted R^2	0.078	0.051	0.069	0.079	0.066	0.120

Note: *p<0.1; **p<0.05; ***p<0.01

Bottom Line: Countercyclical US wealth share is not driven by the dollar

Global Uncertainty Proxies

Proxies: Consider the following proxies for global uncertainty:

$$z_t^i = \left[\Delta IV_t^G, \quad \Delta Uncertainty_t, \quad \Delta VIX_t, \quad \Delta RV_t^G\right]^T \tag{9}$$

IV_t^G: micro-level uncertainty from Dew Becker and Giglio (2021)
$Uncertainty_t$: Uncertainty index from Bekaert and Xu (2020)
VIX_t: VIX in log levels
RV_t^G: global stock market volatility (Lustig and Verdelhan (2011))

Global Risk Premia Proxies

Proxies: Consider the following proxies for global uncertainty:

$$z_t^i = \left[\Delta DEF_t, \quad \Delta GZ_t, \quad \Delta GFC_t, \quad \Delta RA_t\right]^T \tag{10}$$

DEF_t: US Corporate Default Spread
GZ_t: GZ spread
GFC_t: Global return factor from Miranda-Aggropino and Rey (2020)
RA_t: global risk aversion index from Bekaert and Xu (2019)

Policy Shocks Robustness

Description: MP_t are monetary policy news shocks identified by Nakamura and Steinsson (2018) from January 1994 - December 2014. Shocks are aggregated to the quarterly frequency. FP_t are realized quarterly changes in US surplus-debt ratio as in Jiang (2021)

	Dependent variable:			
	$\Delta\omega_t^{US}$		$\Delta\tilde{\mathcal{W}}_t$	
	(1)	(2)	(3)	(4)
MP_t	-0.009		-0.833	
	(0.038)		(3.888)	
FP_t		0.744*		29.618
		(0.436)		(49.887)
Constant	-0.003	-0.002	-0.531**	-0.432*
	(0.002)	(0.002)	(0.245)	(0.240)
Observations	83	102	83	102
Adjusted R^2	-0.012	0.019	-0.012	-0.006
Note:	*p<0.1; **p<0.05; ***p<0.01			

Bottom Line: US wealth share is orthogonal w.r.t US policy shocks.

SVAR Analysis (US Wealth Share, Dollar)

SVAR: To evaluate dynamic response of US wealth share to global shocks, I investigate the following first order SVAR:

$$z_t = \Psi z_{t-1} + \Sigma^{\frac{1}{2}} \epsilon_t \tag{11}$$

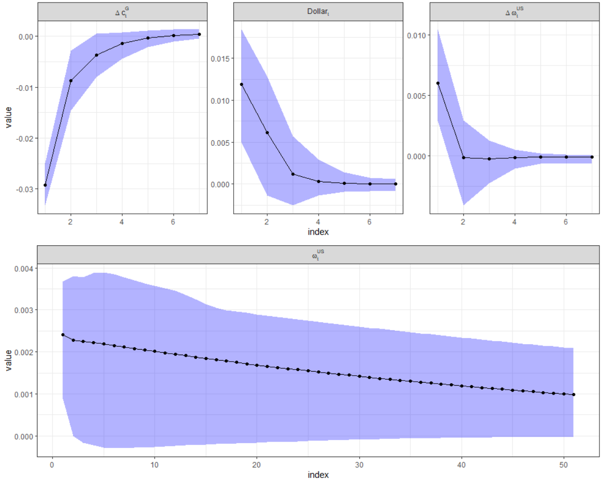
State System: z_t is four dimensional:

$$z_t^i = \left[-\Delta c_t^G, \quad Dollar_t, \quad \omega_t^{US}, \quad \Delta\omega_t^{US} \right]^T \tag{12}$$

Δc_t^G: Global Consumption Growth
$Dollar_t$: Dollar Carry Trade Return (Lustig and Verdelhan, 2011)
ω_t^{US}: US Wealth Share Level
$\Delta\omega_t^{US}$: US Wealth Share Growth Rate

Ordering: Recursive ordering follows (12). Shocks are identified via ***Cholesky decomposition***

SVAR Analysis (US Wealth Share, Dollar)



SVAR Analysis (Global Risk Premia Included)

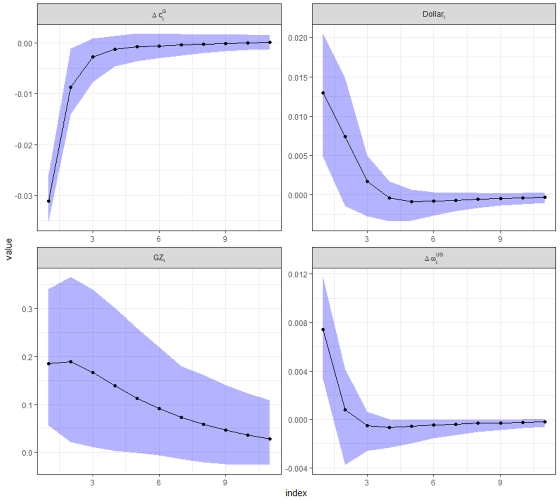
SVAR: I augment baseline SVAR with global risk premia proxy:

$$z_t^i = \left[-\Delta c_t^G, \quad Dollar_t, GZ_t, \quad \omega_t^{US}, \quad \Delta\omega_t^{US}\right]^T \tag{13}$$

Δc_t^G: Global Consumption Growth
$Dollar_t$: Dollar Carry Trade Return (Lustig and Verdelhan, 2011)
GZ_t: GZ spread
ω_t^{US}: US Wealth Share Level
$\Delta\omega_t^{US}$: US Wealth Share Growth Rate

Ordering: Recursive ordering follows (13). Shocks are identified via ***Cholesky decomposition***

SVAR Analysis (Global Risk Premia Included)



Return

Fact 2a: US Wealth Share and the Valuation Channel

Table: Valuation Channel and Global Economy

	Full Sample		Pre-2007		Post-2007	
	$\Delta\mathcal{V}_t$	$\Delta\tilde{\mathcal{D}}_t$	$\Delta\mathcal{V}_t$	$\Delta\tilde{\mathcal{D}}_t$	$\Delta\mathcal{V}_t$	$\Delta\tilde{\mathcal{D}}_t$
Δc_t^G	-0.200***	0.001	-0.154***	-0.001	-0.490***	0.006
	(0.063)	(0.002)	(0.055)	(0.002)	(0.141)	(0.004)
Dollar_t	-0.043***	-0.003	-0.139*	-0.002	-0.81***	-0.009
	(0.097)	(0.032)	(0.077)	(0.032)	(0.167)	(0.005)
Constant	0.007*	0.000	0.005	0.009	0.015**	-0.002
	(0.004)	(0.001)	(0.004)	(0.002)	(0.006)	(0.002)
Observations	103	103	53	53	50	50
Adjusted R^2	0.215	-0.009	0.173	-0.019	0.363	-0.002

Note: *p<0.1; **p<0.05; ***p<0.01

Description: Coefficients are in units of USD trillions. Δc_t^G is a *GDP weighted average* of consumption growths. $Dollar_t$ is the dollar carry trade return. Sample is from 1994Q1 - 2018Q4.

Interpretation: Valuation component $\Delta\mathcal{V}_t$ drives countercyclical US wealth share Return

Fact 2b: Countercyclical US Equity Outperformance

Table: US Equity Outperformance and Global Economy

	Dependent variable: $r_t^{US} - r_t^{ROW}$					
	Full	Full	Pre-2007	Pre-2007	Post-2007	Post-2007
Δc_t^G	-0.587***	-0.400***	-0.521**	-0.378**	-0.846***	-0.572***
	(0.137)	(0.187)	(0.207)	(0.137)	(0.187)	(0.207)
$Dollar_t$		-0.662***		-0.532*		-1.033***
		(0.200)		(0.259)		(0.246)
Constant	0.014***	0.039*	0.047***	0.027***	0.025*	0.037***
	(0.008)	(0.019)	(0.009)	(0.008)	(0.019)	(0.009)
Observations	144	144	97	97	47	47
Adjusted R^2	0.107	0.125	0.067	0.080	0.252	0.295
Note:	*p<0.1; **p<0.05; ***p<0.01					

Description: $r_t^{US} - r_t^{ROW}$ is computed using MSCI total return indices. Δc_t^G is a *GDP weighted average* of consumption growths. $Dollar_t$ is the dollar carry trade return. The full sample is 1983Q4 - 2018Q4. Return

Bond vs Equity Valuation Forces

Comment: Do bond valuation forces matter for the valuation channel?

CY: Jiang et al (2019a) argue that a *convenience yields mechanism* can drive countercyclical US relative wealth dynamics

Measure: $Premium_t$ is the *average CIP deviation for the G9 currencies vis-á-vie the dollar* (Du, Im and Schreger, 2017)

Horserace: Does $Premium_t$ drive out $r_t^{US} - r_t^{ROW}$ in the wealth share regression?

US Equity Outperformance vs US Convenience Yields

Table: US Equity Outperformance vs Convenience Yields

	Dependent variable: $\Delta \tilde{V}_t$					
	Full	Full	Pre	Pre	Post	Post
premium_t	1.702**	0.793	-1.394	-1.186	2.419**	0.386
	(0.724)	(0.582)	(0.911)	(0.749)	(1.044)	(0.774)
$r_t^{US} - r_t^{ROW}$		30.912***		15.014***		51.638***
		(3.907)		(2.957)		(7.068)
Constant	-0.873***	-0.993***	-0.273	-0.398	-0.875*	-1.289***
	(0.301)	(0.238)	(0.291)	(0.240)	(0.520)	(0.364)
Observations	103	103	53	53	50	50
Adjusted R^2	0.042	0.405	0.025	0.344	0.082	0.561

Note: *p<0.1; **p<0.05; ***p<0.01

Interpretation: In the univariate regressions, higher convenience yields are associated with higher US wealth share, consistent with Jiang et al (2019a)

US Equity Outperformance vs US Convenience Yields

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Interpretation: Convenience yields are driven out of the regression by equity return differentials $r_t^{US} - r_t^{ROW}$

Return

Global Shock Exposure of US

Table: *Global Shock Exposures Across the World*

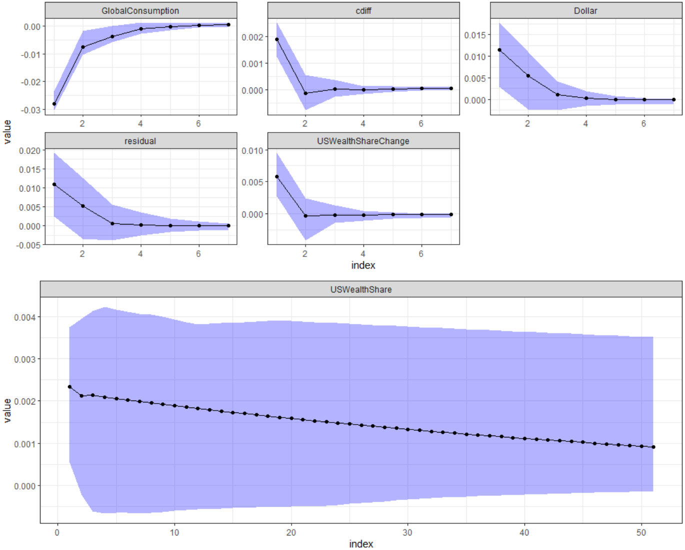
Description: This table reports the global consumption growth betas β^i_G extracted from the following regression:

$$\Delta c^G_t = \alpha + \beta^i_G \Delta c^i_t + \epsilon^i_t \tag{14}$$

	Global Consumption Growth Exposures								
	Japan	Sweden	US	Switzerland	Australia	Germany	Norway	Canada	UK
β^i_G	0.067*** (0.006)	0.071*** (0.004)	0.089*** (0.003)	0.092*** (0.004)	0.100*** (0.004)	0.101*** (0.004)	0.103*** (0.005)	0.128*** (0.003)	0.191*** (0.004)
Adjusted R^2	0.551	0.763	0.907	0.861	0.851	0.832	0.792	0.950	0.946

Note: *p<0.1; **p<0.05; ***p<0.01

Global Shock Exposure of US



Return

Outline

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3 Stylised Facts
4 Mechanism
5 Theory
6 Empirical Appendix
7 Model Appendix

Recursive Resolution

Environment: Two country recursive model of int risk sharing that is closely related to Colacito and Croce (2013).

1. **EZ Endowment Economies**: Infinitely lived EZ rep investor who solves an intertemporal consumption, saving problem
2. **Two Countries, Two Goods**: Each country is endowed with a unique good that is internationally tradable.
3. **Global Shock Exposure**: US endowment *more* exposed to global endowment shock

Solution: Approximate model to ***third order*** around deterministic steady state where pareto weight dist is symmetric (Colacito and Croce, 2013). Model Details

US Wealth Share and the Dollar (Analytical Note)

Insight: *Wealth share channel* attenuates dollar response during global recessions in EZ world

Example: Consider a global shock ξ_t^G that reduces $\mathcal{C}_{t+1} = \Delta c_{t+1}^{US} - \Delta c_{t+1}^{ROW}$ by 1%. Then dollar elasticity w.r.t ξ_t^G can be approximated as:

$$\varphi = \frac{\partial \Delta \mathcal{E}_{t+1}}{\partial \mathcal{C}_{t+1}} + \frac{\partial \Delta \mathcal{E}_{t+1}}{\partial \mathcal{W}_{t+1}} \frac{\partial \mathcal{W}_{t+1}}{\partial \mathcal{C}_{t+1}} = \underbrace{-\gamma}_{Supply\ \ Channel} + \underbrace{\kappa_1 (1-\theta)(1-\lambda)}_{Wealth\ \ Share\ \ Channel} \quad (15)$$

Implication: Wealth share channel attenuates dollar response during global recessions in EZ model.

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Consumption Markets

Two Countries, Two Goods: Two countries: *Home* and *Foreign*. Both are endowed with a unique good that is internationally tradable.

Endowments: Log endowments x_t^i feature ***cointegration*** and is driven by a country specific shock ξ_{t+1}^i and a global shock ξ_{t+1}^G:

$$
\begin{aligned}
x_{t+1}^H &= \mu + x_t^H - \beta(x_t^H - x_t^F) + \xi_{t+1}^H + \tau_H \xi_{t+1}^G \\
x_{t+1}^F &= \mu + x_t^F + \beta(x_t^H - x_t^F) + \xi_{t+1}^F + \tau_F \xi_{t+1}^G
\end{aligned} \tag{16}
$$

μ: *Mean Endowment Growth Rate*

β: *Degree of Cointegration*

τ_i: *Global Shock Exposure of country i*

Global Exposure: Home *less* exposed to global shock: $\tau_H < \tau_F$

Consumption Aggregator

CES: Consumption streams for both investors are defined over a general CES aggregator of the two goods:

$$C_t^H = [\alpha^{\frac{1}{\phi}}(C_{H,t}^H)^{\frac{\phi-1}{\phi}} + (1-\alpha)^{\frac{1}{\phi}}(C_{F,t}^H)^{\frac{\phi-1}{\phi}}]^{\frac{\phi}{\phi-1}} \quad (17)$$

$$C_t^F = [(1-\alpha)^{\frac{1}{\phi}}(C_{H,t}^F)^{\frac{\phi-1}{\phi}} + (\alpha)^{\frac{1}{\phi}}(C_{F,t}^F)^{\frac{\phi-1}{\phi}}]^{\frac{\phi}{\phi-1}} \quad (18)$$

Consumption Aggregator

$C_{H,t}^H$, $C_{F,t}^H$: *Home consumption of the home and foreign good*

$C_{H,t}^F$, $C_{F,t}^F$: *Foreign consumption of the home and foreign good*

Preference Parameters

α: *Preference parameter for local good*

ϕ: *Elasticity of Substitution across both goods*

Numeraire: Home consumption basket is the global numeraire.

Preferences

Utility: Each country is populated by a representative agent with Epstein and Zin (1989) and Weil (1989) recursive preferences:

$$U_t^i = \left[(1-\delta)(C_t^i)^{1-\frac{1}{\psi}} + \delta\left(E_t {U_{t+1}^i}^{1-\gamma}\right)^{\frac{1-\frac{1}{\psi}}{1-\gamma}}\right]^{\frac{1}{1-\frac{1}{\psi}}}, i \in \{H, F\} \quad (19)$$

δ: *Time Preference*

ψ: *Intertemporal Elasticity of Substitution (IES)*

γ: *Relative Risk Aversion*

C_t^i: *Consumption Basket for country i at time t*

Home Agent's Problem

Overview: Each period the home investor chooses:

1. Non-negative consumption: $C^H_{H,t}, C^H_{F,t}$
2. Wealth: W^H_t

Problem: Home investor's problem is:

$$\max_{\{C^H_{H,t}, C^H_{F,t}, W^H_t\}} U^H_t = \left[(1-\delta)\left(C^H_t\right)^{1-\frac{1}{\psi}} + \delta\left(E_t {U^H_{t+1}}^{1-\gamma}\right)^{\frac{1-\frac{1}{\psi}}{1-\gamma}}\right]^{\frac{1}{1-\frac{1}{\psi}}} \quad (20)$$

Subject to the intertemporal budget constraint (IBC):

$$W^i_{t+1} = r^i_{m,t+1}\left(W^i_t - P^i_t C^i_t\right) \quad (21)$$

Equilibrium

Definition: Equilibrium consists of prices $\{p_t^H, p_t^F, \mathcal{Q}_{F,t}, \mathcal{Q}_{H,t}, \mathcal{Q}_{B,t}\}$, consumption allocations $\{C_{H,t}^H, C_{F,t}^H, C_{H,t}^F, C_{F,t}^F\}$ and wealth $\{W_t^H, W_t^F\}$ such that:

1. Each rep investor i maximises (19) subject to (21)
2. Goods market clears:

$$\begin{aligned} X_t^H &= C_{H,t}^H + C_{H,t}^F \\ X_t^F &= C_{F,t}^F + C_{F,t}^H \end{aligned} \tag{22}$$

Solution Method

State Variables: Eq system can be formulated in terms of state vector Z_t:

$$Z_t = [\underbrace{\xi_t^H \quad , \quad \xi_t^F \quad , \quad \xi_t^G}_{Exogenous} \quad , \quad \underbrace{S_t}_{Endogenous} \quad]^T \tag{23}$$

Pareto Weight: Home pareto weight S_t follows recursion:

$$S_t = S_{t-1}(\mathcal{E}_t)^{-\phi} Y_t \tag{24}$$

Solution: Numerically approximate model to ***third*** order around symmetric steady state where $S_t = \overline{S} = 1$

Note: Symmetric wealth distribution is common approximation point in int macro (Devereux and Sutherland, 2011; Coeurdacier, 2009)

Baseline Calibration

Calibration: Baseline calibration is presented below:

Panel A: *Preference Parameters*		
Parameter	Description	Value
γ	Relative Risk Aversion	7.5
ψ	Intertemporal Elasticity of Substitution	2
α	Home Bias Parameter	0.98
δ	Discount Factor	0.99
ϕ	Elasticity of Substitution across Goods	0.2

Panel B: *Endowment Parameters*		
Parameter	Description	Value
τ_H	Home Endowment Exposure to Global Shock	0.5
τ_F	Foreign Endowment Exposure to Global Shock	1.5
μ	Mean Endowment Growth Rate	0.005
β	Cointegration Parameter	0.01

Global Long Run Risks Extension

LRRs: To incorporate this extension I add a global long run shock $\xi^G_{x,t}$ to the country specific endowment processes:

$$x^H_{t+1} = \mu + x^H_t - \beta(x^H_t - x^F_t) + \xi^H_{t+1} + \tau_H \xi^G_{t+1} + \tau_{L,H} z^G_t$$
$$x^F_{t+1} = \mu + x^F_{t+1} + \beta(x^H_t - x^F_t) + \xi^F_t + \tau_F \xi^G_{t+1} + \tau_{L,F} z^G_t \quad (25)$$

$z^G_{x,t}$ follows an AR(1):

$$z^G_t = \rho_x z^G_{t-1} + \xi^G_{x,t} \quad (26)$$

Exposures: $\tau_H < \tau_F$, $\tau_{L,H} > \tau_{L,F}$

Shock Structure: ξ^G_t has a *positive* correlation with the contemporaneous global shock ξ^G_t which is parameterized by $\chi > 0$. All other shock correlations are zero.

Return