US Wealth Shares, the Dollar and Global Risk Premia

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2 Framework

3 Stylised Facts

4 Mechanism

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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*
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.*

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.
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); Maggiord (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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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:

$$W_t^i = Q_{US,t}^E + Q_{ROW,t}^E + Q_{US,t}^D + Q_{ROW,t}^D, \ i \in \{US, ROW\}$$

- $Q_{US,t}^E$: Country i’s holdings of US equities
- $Q_{ROW,t}^E$: Country i’s holdings of ROW equities
- $Q_{US,t}^D$: Country i’s holdings of US bonds
- $Q_{ROW,t}^D$: Country i’s holdings of ROW equities
US Wealth Share Measures

Wealth Share:  **US wealth share** $\omega_{US}^t$ is defined as:

$$\omega_{US}^t = \frac{\mathcal{W}_{US}^t}{\mathcal{W}_{US}^t + \mathcal{W}_{ROW}^t} \quad (2)$$

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

$$\tilde{\mathcal{W}}^t = \mathcal{W}_{US}^t - \mathcal{W}_{ROW}^t \quad (3)$$

Empirics: Due to persistence, I work with growth rates: $\Delta \omega_{US}^t, \Delta \tilde{\mathcal{W}}^t$
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
   \[
   \left(Q_{E,US}, Q_{D,US}, Q_{ROW,t}, t\right)
   \]
2. **ROW:** Monthly *stock* dataset of ROW holdings of US Equity + Debt
   \[
   \left(Q_{E,ROW}, Q_{D,ROW}, Q_{US,t}, t\right)
   \]

**Asset Coverage:** Portfolio equity and publicly issued bonds (Treasury, Agency, Corporate)
Internal Holdings Data

**Estimation:** Internal holdings $Q_{E,i,t}^{}, Q_{D,i,t}^{}$ backed out from market values:

\[
\begin{align*}
Q_{US,t}^{E,US} &= Q_{US,t}^{E} - Q_{US,t}^{E,ROW} \\
Q_{ROW,t}^{E,ROW} &= Q_{ROW,t}^{E} - Q_{ROW,t}^{E,US} \\
Q_{US,t}^{D,US} &= Q_{US,t}^{D} - Q_{US,t}^{D,ROW} \\
Q_{ROW,t}^{D,ROW} &= Q_{ROW,t}^{D} - Q_{ROW,t}^{D,US}
\end{align*}
\]

(4)

$Q_{E,i,t}^{}$: Dollar market cap of country $i$'s stock market

$Q_{D,i,t}^{}$: 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

Global Consumption

Global IP

Global GDP

Kilian

Sun Yong Kim

US Wealth Shares, the Dollar and Global Risk Premia
Fact 1: US Wealth Share is countercyclical

Table: US Wealth Share and Global Economy

<table>
<thead>
<tr>
<th></th>
<th>Wealth Share: $\Delta \omega^U_{t}$</th>
<th>Relative Wealth: $\Delta \tilde{W}_{t}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full</td>
<td>Pre-2007</td>
</tr>
<tr>
<td>$\Delta c^G_{t}$</td>
<td>$-0.166^{***}$</td>
<td>$-0.187^{**}$</td>
</tr>
<tr>
<td></td>
<td>$(0.053)$</td>
<td>$(0.090)$</td>
</tr>
<tr>
<td>Dollar$_t$</td>
<td>$-0.373^{***}$</td>
<td>$-0.246^{*}$</td>
</tr>
<tr>
<td></td>
<td>$(0.081)$</td>
<td>$(0.126)$</td>
</tr>
<tr>
<td>Constant</td>
<td>$0.008^{**}$</td>
<td>$0.009$</td>
</tr>
<tr>
<td></td>
<td>$(0.003)$</td>
<td>$(0.007)$</td>
</tr>
<tr>
<td>Observations</td>
<td>103</td>
<td>53</td>
</tr>
<tr>
<td>Adjusted R$^2$</td>
<td>0.220</td>
<td>0.121</td>
</tr>
</tbody>
</table>

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

Description: $\Delta c^G_{t}$ 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 $\Delta c^G_{t}$ 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 $\Delta \tilde{\gamma}_t$ increased by approximately 3.74% during this period.

**Interpretation**: These magnitudes are modest but economically meaningful.

**Bottom Line**: *US gains relative wealth vis-à-vie the ROW during global recessions.*
Fact 1b: US Wealth Share and Dollar

**Description:** This figure plots $\Delta \omega_t^{US}, \Delta \tilde{W}_t$ (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 $\Delta \tilde{W}_t$.

### Panel A: Global Uncertainty Proxies

<table>
<thead>
<tr>
<th></th>
<th>$\Delta IV^G_t$</th>
<th>$\Delta \text{Uncertainty}_t$</th>
<th>$\Delta VIX_t$</th>
<th>$\Delta RV^G_t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta \tilde{W}_t$</td>
<td>0.028***</td>
<td>0.018**</td>
<td>0.023**</td>
<td>0.055**</td>
</tr>
<tr>
<td>Observations</td>
<td>93</td>
<td>103</td>
<td>103</td>
<td>103</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.106</td>
<td>0.051</td>
<td>0.040</td>
<td>0.038</td>
</tr>
</tbody>
</table>

### Panel B: Global Risk Premia Proxies

<table>
<thead>
<tr>
<th></th>
<th>$\Delta DEF_t$</th>
<th>$\Delta GZ_t$</th>
<th>$\Delta GFC_t$</th>
<th>$\Delta RA_t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta \tilde{W}_t$</td>
<td>0.033***</td>
<td>0.025***</td>
<td>-0.091***</td>
<td>0.018**</td>
</tr>
<tr>
<td>Observations</td>
<td>103</td>
<td>103</td>
<td>103</td>
<td>103</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.194</td>
<td>0.117</td>
<td>0.080</td>
<td>0.051</td>
</tr>
</tbody>
</table>

*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.*

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US Wealth Shares, the Dollar and Global Risk Premia  
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Fact 1a: Countercyclical US Wealth Share

The US wealth share is countercyclical w.r.t. the global economy: the US gains relative wealth vis-à-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


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 $W^i_t$ into valuation and flow components: $V^i_t$, $D^i_t$:

$$W^i_t = W^i_{t-1}(\pi^i_{t-1}'r_t) + D^i_t$$  \(5\)

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

$$\Delta\tilde{W}_t = \Delta\tilde{V}_t^{US} - \Delta\tilde{V}_t^{ROW} + \Delta\tilde{D}_t^{US} - \Delta\tilde{D}_t^{ROW}$$  \(6\)

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

$$\text{var}(\Delta\tilde{W}_t) = \text{var}(\Delta\tilde{V}_t) + \text{var}(\Delta\tilde{D}_t) + 2\text{cov}(\Delta\tilde{V}_t, \Delta\tilde{D}_t)$$  \(7\)
Fact 2a: US Wealth Share and the Valuation Channel

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

<table>
<thead>
<tr>
<th>Sample</th>
<th>$\frac{\text{var}(\Delta \tilde{V}_t)}{\text{var}(\Delta \tilde{W}_t)}$</th>
<th>$\frac{\text{var}(\Delta \tilde{D}_t)}{\text{var}(\Delta \tilde{W}_t)}$</th>
<th>$\frac{2\text{cov}(\Delta \tilde{V}_t, \Delta \tilde{D}_t)}{\text{var}(\Delta \tilde{W}_t)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Sample</td>
<td>0.741</td>
<td>0.309</td>
<td>-0.050</td>
</tr>
<tr>
<td>Pre 2007</td>
<td>0.817</td>
<td>0.128</td>
<td>0.055</td>
</tr>
<tr>
<td>Post 2007</td>
<td>0.727</td>
<td>0.343</td>
<td>-0.070</td>
</tr>
</tbody>
</table>

Takeaway: Valuation component $\Delta \tilde{V}_t$ drive US relative wealth dynamics
Fact 2b: Countercyclical US Equity Outperformance

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

**Interpretation:** US stock market outperforms ROW during global recessions.
Fact 2b: US Equity Outperformance

**Table: US Equity Outperformance and Valuation Channel**

<table>
<thead>
<tr>
<th></th>
<th>Full Pre-2007</th>
<th>Pre-2007</th>
<th>Post-2007</th>
<th>Post-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r_t^{US} - r_t^{ROW}$</td>
<td>0.257***</td>
<td>0.114***</td>
<td>0.144***</td>
<td>0.441***</td>
</tr>
<tr>
<td></td>
<td>(0.045)</td>
<td>(0.026)</td>
<td>(0.030)</td>
<td>(0.087)</td>
</tr>
<tr>
<td>Dollar$_t$</td>
<td>-0.230***</td>
<td>-0.112</td>
<td>-0.031***</td>
<td>-0.011***</td>
</tr>
<tr>
<td></td>
<td>(0.087)</td>
<td>(0.069)</td>
<td>(0.03)</td>
<td>(0.152)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.003***</td>
<td>-0.004***</td>
<td>-0.006***</td>
<td>-0.031***</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.003)</td>
</tr>
<tr>
<td>Observations</td>
<td>103</td>
<td>53</td>
<td>53</td>
<td>50</td>
</tr>
<tr>
<td>Adjusted R$^2$</td>
<td>0.376</td>
<td>0.285</td>
<td>0.346</td>
<td>0.543</td>
</tr>
</tbody>
</table>

**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.
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-à-vie the ROW during global bad times.**
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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-vis 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**: \( \omega_t^{US} \uparrow \) 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 $S_t$:

$$S_t = S_{t-1}(E_t)^{-\phi} Y_t$$ (8)

$E_t$: ROW consumption per US consumption

$Y_t$: Relative Consumption Ratio ($Y_t = \frac{C_F}{C_H}$)

$\phi$: 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 $S_t = \bar{S} = 1$ (Colacito and Croce, 2013).
Baseline Calibration

Calibration: Baseline calibration is presented below:

Panel A: Preference Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\gamma$</td>
<td>Relative Risk Aversion</td>
<td>7.5</td>
</tr>
<tr>
<td>$\psi$</td>
<td>Intertemporal Elasticity of Substitution</td>
<td>2</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>Home Bias Parameter</td>
<td>0.98</td>
</tr>
<tr>
<td>$\delta$</td>
<td>Discount Factor</td>
<td>0.99</td>
</tr>
<tr>
<td>$\phi$</td>
<td>Elasticity of Substitution across Goods</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Panel B: Endowment Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\tau_H$</td>
<td>Home Endowment Exposure to Global Shock</td>
<td>0.5</td>
</tr>
<tr>
<td>$\tau_F$</td>
<td>Foreign Endowment Exposure to Global Shock</td>
<td>1.5</td>
</tr>
<tr>
<td>$\mu$</td>
<td>Mean Endowment Growth Rate</td>
<td>0.005</td>
</tr>
<tr>
<td>$\beta$</td>
<td>Cointegration Parameter</td>
<td>0.01</td>
</tr>
</tbody>
</table>
**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.

<table>
<thead>
<tr>
<th>Dependent variable: $\Delta \omega_{t}^{US}$</th>
<th>Data</th>
<th>EZ</th>
<th>CRRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta c_{t}^{G}$</td>
<td>-0.166***</td>
<td>-0.365***</td>
<td>-7.901***</td>
</tr>
<tr>
<td>(0.063)</td>
<td>(0.087)</td>
<td>(0.798)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dependent variable: $r_{t}^{US} - r_{t}^{ROW}$</th>
<th>Data</th>
<th>EZ</th>
<th>CRRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta c_{t}^{G}$</td>
<td>-0.400***</td>
<td>-0.780***</td>
<td>-7.201***</td>
</tr>
<tr>
<td>(0.137)</td>
<td>(0.173)</td>
<td>(0.874)</td>
<td></td>
</tr>
</tbody>
</table>

**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:

- **Legend:**
  - Data
  - EZ
  - CRRA

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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*

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:

![Graphs showing IRFs](image-url)
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: $\eta_t^\omega$ and $\eta_t^{\tilde{\omega}}$ are the orthogonalised component of $\Delta \omega_t^U S$, $\Delta \tilde{\omega}_t$ w.r.t the dollar respectively. The full sample is from 1994Q1 - 2018Q4.

<table>
<thead>
<tr>
<th></th>
<th>$\eta_t^\omega$</th>
<th></th>
<th>$\eta_t^{\tilde{\omega}}$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full</td>
<td>Pre-2007</td>
<td>Post-2007</td>
<td>Full</td>
</tr>
<tr>
<td>$\Delta c_t^G$</td>
<td>-0.165***</td>
<td>-0.175**</td>
<td>-0.189**</td>
<td>-0.181***</td>
</tr>
<tr>
<td></td>
<td>(0.053)</td>
<td>(0.089)</td>
<td>(0.088)</td>
<td>(0.058)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.009**</td>
<td>0.010</td>
<td>0.009**</td>
<td>0.008**</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.007)</td>
<td>(0.004)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Observations</td>
<td>103</td>
<td>53</td>
<td>50</td>
<td>103</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.078</td>
<td>0.051</td>
<td>0.069</td>
<td>0.079</td>
</tr>
</tbody>
</table>

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:

$$z_t^i = \left[ \Delta IV_t^G, \Delta Uncertainty_t, \Delta VIX_t, \Delta RV_t^G \right]^T$$  (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:

\[ z_t^i = \begin{bmatrix} \Delta DEF_t, \Delta GZ_t, \Delta GFC_t, \Delta RA_t \end{bmatrix}^T \]  \hspace{1cm} (10)

**\( \Delta DEF_t \):** 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)

<table>
<thead>
<tr>
<th></th>
<th>$\Delta \omega_{US}^t$</th>
<th>$\Delta \tilde{W}_t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$(1)$ $MP_t$</td>
<td>-0.009</td>
<td>-0.833</td>
</tr>
<tr>
<td>$(2)$</td>
<td>(0.038)</td>
<td>(3.888)</td>
</tr>
<tr>
<td>$(3)$ $FP_t$</td>
<td>0.744*</td>
<td>29.618</td>
</tr>
<tr>
<td>$(4)$</td>
<td>(0.436)</td>
<td>(49.887)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.003</td>
<td>-0.002</td>
</tr>
<tr>
<td>$(5)$</td>
<td>(0.002)</td>
<td>(0.245)</td>
</tr>
<tr>
<td>$(6)$</td>
<td></td>
<td>(0.240)</td>
</tr>
<tr>
<td>Observations</td>
<td>83</td>
<td>102</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>-0.012</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.006</td>
</tr>
</tbody>
</table>

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:

\[ z_t = \Psi z_{t-1} + \sum \frac{1}{2} \epsilon_t \]  \hspace{1cm} (11)

**State System**: \( z_t \) is four dimensional:

\[ z^i_t = [-\Delta c^G_t, \text{Dollar}_t, \omega^US_t, \Delta \omega^US_t]^T \]  \hspace{1cm} (12)

\( \Delta c^G_t \): Global Consumption Growth  
\( \text{Dollar}_t \): Dollar Carry Trade Return (Lustig and Verdelhan, 2011)  
\( \omega^US_t \): US Wealth Share Level  
\( \Delta \omega^US_t \): 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:

\[ z_t^i = [-\Delta c_t^G, \ Dollar_t, GZ_t, \ \omega_t^{US}, \ \Delta \omega_t^{US}]^T \]  \hspace{1cm} (13)

- \( \Delta c_t^G \): Global Consumption Growth
- \( Dollar_t \): Dollar Carry Trade Return (Lustig and Verdelhan, 2011)
- \( GZ_t \): GZ spread
- \( \omega_t^{US} \): 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)
Fact 2a: US Wealth Share and the Valuation Channel

Table: Valuation Channel and Global Economy

<table>
<thead>
<tr>
<th></th>
<th>Full Sample</th>
<th>Pre-2007</th>
<th>Post-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δc_t^G</td>
<td>-0.200***</td>
<td>0.001</td>
<td>-0.154***</td>
</tr>
<tr>
<td></td>
<td>(0.063)</td>
<td>(0.002)</td>
<td>(0.055)</td>
</tr>
<tr>
<td>Dollar_t</td>
<td>-0.043***</td>
<td>-0.003</td>
<td>-0.139*</td>
</tr>
<tr>
<td></td>
<td>(0.097)</td>
<td>(0.032)</td>
<td>(0.077)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.007*</td>
<td>0.000</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.001)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Observations</td>
<td>103</td>
<td>103</td>
<td>53</td>
</tr>
<tr>
<td>Adjusted R^2</td>
<td>0.215</td>
<td>-0.009</td>
<td>0.173</td>
</tr>
</tbody>
</table>

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 ΔV_t drives countercyclical US wealth share.
**Fact 2b: Countercyclical US Equity Outperformance**

**Table: US Equity Outperformance and Global Economy**

<table>
<thead>
<tr>
<th>Dependent variable: $r_{t}^{US} - r_{t}^{ROW}$</th>
<th>Full</th>
<th>Full Pre-2007</th>
<th>Pre-2007</th>
<th>Post-2007</th>
<th>Post-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta c_{G}^{t}$</td>
<td>-0.587***</td>
<td>-0.400***</td>
<td>-0.521**</td>
<td>-0.378**</td>
<td>-0.846***</td>
</tr>
<tr>
<td></td>
<td>(0.137)</td>
<td>(0.187)</td>
<td>(0.207)</td>
<td>(0.137)</td>
<td>(0.187)</td>
</tr>
<tr>
<td>Dollar$_{t}$</td>
<td>-0.662***</td>
<td>-0.532*</td>
<td>-1.033***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.200)</td>
<td>(0.259)</td>
<td>(0.246)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.014***</td>
<td>0.039*</td>
<td>0.047***</td>
<td>0.027***</td>
<td>0.025*</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.019)</td>
<td>(0.009)</td>
<td>(0.008)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Observations</td>
<td>144</td>
<td>144</td>
<td>97</td>
<td>97</td>
<td>47</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.107</td>
<td>0.125</td>
<td>0.067</td>
<td>0.080</td>
<td>0.252</td>
</tr>
</tbody>
</table>

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

**Description:** $r_{t}^{US} - r_{t}^{ROW}$ is computed using MSCI total return indices. $\Delta c_{G}^{t}$ is a *GDP weighted average* of consumption growths. Dollar$_{t}$ is the dollar carry trade return. The full sample is 1983Q4 - 2018Q4.

---

Sun Yong Kim

**US Wealth Shares, the Dollar and Global Risk Premia**

Northwestern University
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-à-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?
### Table: US Equity Outperformance vs Convenience Yields

<table>
<thead>
<tr>
<th></th>
<th>Full</th>
<th>Full</th>
<th>Pre</th>
<th>Pre</th>
<th>Post</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>premium&lt;sub&gt;t&lt;/sub&gt;</td>
<td>1.702**</td>
<td>0.793</td>
<td>-1.394</td>
<td>-1.186</td>
<td>2.419**</td>
<td>0.386</td>
</tr>
<tr>
<td></td>
<td>(0.724)</td>
<td>(0.582)</td>
<td>(0.911)</td>
<td>(0.749)</td>
<td>(1.044)</td>
<td>(0.774)</td>
</tr>
<tr>
<td>r&lt;sub&gt;US&lt;/sub&gt; - r&lt;sub&gt;ROW&lt;/sub&gt;</td>
<td>30.912***</td>
<td>15.014***</td>
<td>51.638***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.907)</td>
<td>(2.957)</td>
<td>(7.068)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.873***</td>
<td>-0.993***</td>
<td>-0.875*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.301)</td>
<td>(0.238)</td>
<td>(0.520)</td>
<td>(0.364)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Observations: 103 103 53 53 50 50
Adjusted R<sup>2</sup>: 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

Table: US Equity Outperformance vs Convenience Yields

<table>
<thead>
<tr>
<th>Dependent variable: $\Delta \tilde{V}_t$</th>
<th>Full</th>
<th>Full</th>
<th>Pre</th>
<th>Pre</th>
<th>Post</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>premium$_t$</td>
<td>1.702** (0.724)</td>
<td>0.793 (0.582)</td>
<td>-1.394 (0.911)</td>
<td>-1.186 (0.749)</td>
<td>2.419** (1.044)</td>
<td>0.386 (0.774)</td>
</tr>
<tr>
<td>$r^U_t - r^ROW_t$</td>
<td>30.912*** (3.907)</td>
<td>15.014*** (2.957)</td>
<td>51.638*** (7.068)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.873*** (0.301)</td>
<td>-0.993*** (0.238)</td>
<td>-0.273 (0.291)</td>
<td>-0.398 (0.240)</td>
<td>-0.875* (0.520)</td>
<td>-1.289*** (0.364)</td>
</tr>
<tr>
<td>Observations</td>
<td>103</td>
<td>103</td>
<td>53</td>
<td>53</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Adjusted R$^2$</td>
<td>0.042</td>
<td>0.405</td>
<td>0.025</td>
<td>0.344</td>
<td>0.082</td>
<td>0.561</td>
</tr>
</tbody>
</table>

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

Interpretation: Convenience yields are driven out of the regression by equity return differentials $r^U_t - r^ROW_t$
Global Shock Exposure of US

Table: Global Shock Exposures Across the World

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

$$\Delta c^G_t = \alpha + \beta^i_G \Delta c^i_t + \epsilon^i_t$$ \hspace{1cm} (14)

<table>
<thead>
<tr>
<th>Global Consumption Growth Exposures</th>
<th>Japan</th>
<th>Sweden</th>
<th>US</th>
<th>Switzerland</th>
<th>Australia</th>
<th>Germany</th>
<th>Norway</th>
<th>Canada</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta^i_G$</td>
<td>0.067***</td>
<td>0.071***</td>
<td>0.089***</td>
<td>0.092***</td>
<td>0.100***</td>
<td>0.101***</td>
<td>0.103***</td>
<td>0.128***</td>
<td>0.191***</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.551</td>
<td>0.763</td>
<td>0.907</td>
<td>0.861</td>
<td>0.851</td>
<td>0.832</td>
<td>0.792</td>
<td>0.950</td>
<td>0.946</td>
</tr>
</tbody>
</table>

Note: *p<0.1; **p<0.05; ***p<0.01
Global Shock Exposure of US

Sun Yong Kim

US Wealth Shares, the Dollar and Global Risk Premia
Outline

1 Motivation
2 Framework
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).
Insight: *Wealth share channel* attenuates dollar response during global recessions in EZ world.

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

$$\varphi = \frac{\partial \Delta E_{t+1}}{\partial C_{t+1}} + \frac{\partial \Delta E_{t+1}}{\partial W_{t+1}} \frac{\partial W_{t+1}}{\partial C_{t+1}} = -\gamma + \kappa_1 (1 - \theta)(1 - \lambda) \quad (15)$$

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

Return
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 $x^i_t$ feature \textit{cointegration} and is driven by a country specific shock $\xi^i_{t+1}$ and a global shock $\xi^G_{t+1}$:

\begin{align*}
  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} \\
  x^F_{t+1} &= \mu + x^F_t + \beta(x^H_t - x^F_t) + \xi^F_{t+1} + \tau_F \xi^G_{t+1} 
\end{align*}

$\mu$: Mean Endowment Growth Rate  \\
$\beta$: Degree of Cointegration  \\
$\tau_i$: Global Shock Exposure of country $i$

Global Exposure: Home \textit{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:

\[
C^H_t = \left[ \alpha \frac{1}{\phi} (C^H_{H,t})^{\frac{\phi-1}{\phi}} + (1 - \alpha) \frac{1}{\phi} (C^H_{F,t})^{\frac{\phi-1}{\phi}} \right]^{\frac{1}{\phi-1}} 
\]

\[
C^F_t = \left[ (1 - \alpha) \frac{1}{\phi} (C^F_{H,t})^{\frac{\phi-1}{\phi}} + (\alpha) \frac{1}{\phi} (C^F_{F,t})^{\frac{\phi-1}{\phi}} \right]^{\frac{1}{\phi-1}} 
\]

**Preference Parameters**

- \( \alpha \): Preference parameter for local good
- \( \phi \): 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:

\[
U^i_t = \left[ (1 - \delta)(C^i_t)^{1 - \frac{1}{\psi}} + \delta(E_t U^i_{t+1}^{1 - \gamma})^{\frac{1 - \frac{1}{\psi}}{1 - \gamma}} \right]^{1 - \frac{1}{\psi}}, \ i \in \{H, F\} 
\]  
\hspace{2cm} (19)

\(\delta\): Time Preference

\(\psi\): Intertemporal Elasticity of Substitution (IES)

\(\gamma\): Relative Risk Aversion

\(C^i_t\): Consumption Basket for country \(i\) at time \(t\)
Home Agent’s Problem

Overview: Each period the home investor chooses:

1. Non-negative consumption: $C_{H,t}^H, C_{F,t}^H$
2. Wealth: $W_t^H$

Problem: Home investor’s problem is:

$$\max_{\{C_{H,t}^H, C_{F,t}^H, W_t^H\}} U_t^H = \left[ (1 - \delta) \left( C_t^H \right)^{1 - \frac{1}{\psi}} + \delta \left( E_t U_{t+1}^H \right)^{1 - \gamma} \right]^{1 - \frac{1}{\psi}} \left( 1 - \frac{1}{\psi} \right)$$ \hspace{1cm} (20)

Subject to the intertemporal budget constraint (IBC):

$$W_{t+1}^i = r_{m,t+1}^i \left( W_t^i - P_t^i C_t^i \right)$$ \hspace{1cm} (21)
**Equilibrium**

**Definition:** Equilibrium consists of prices \( \{ p^H_t, p^F_t, Q_F,t, Q_H,t, Q_B,t \} \), consumption allocations \( \{ C^H_{H,t}, C^H_{F,t}, C^F_{H,t}, C^F_{F,t} \} \) and wealth \( \{ W^H_t, W^F_t \} \) such that:

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

\[
\begin{align*}
X^H_t &= C^H_{H,t} + C^F_{H,t} \\
X^F_t &= C^F_{F,t} + C^H_{F,t}
\end{align*}
\]  
(22)
Solution Method

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

$$Z_t = \begin{bmatrix} \xi_t^H, & \xi_t^F, & \xi_t^G, & S_t \end{bmatrix}^T$$

(23)

Pareto Weight: Home pareto weight $S_t$ follows recursion:

$$S_t = S_{t-1}(E_t)^{-\phi}Y_t$$

(24)

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

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:

<table>
<thead>
<tr>
<th>Panel A: Preference Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>$\gamma$</td>
</tr>
<tr>
<td>$\psi$</td>
</tr>
<tr>
<td>$\alpha$</td>
</tr>
<tr>
<td>$\delta$</td>
</tr>
<tr>
<td>$\phi$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Endowment Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
</tr>
<tr>
<td>$\tau_H$</td>
</tr>
<tr>
<td>$\tau_F$</td>
</tr>
<tr>
<td>$\mu$</td>
</tr>
<tr>
<td>$\beta$</td>
</tr>
</tbody>
</table>
Global Long Run Risks Extension

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

$$
\begin{align*}
x_{t+1}^H &= \mu + x_t^H - \beta(x_t^H - x_t^F) + \xi_{t+1}^H + \tau_H\xi_{t+1}^G + \tau_{L,H}z_{G,t}^H \\
x_{t+1}^F &= \mu + x_{t+1}^F + \beta(x_t^H - x_t^F) + \xi_{t}^F + \tau_F\xi_{t+1}^G + \tau_{L,F}z_{G,t}^F
\end{align*}
$$

(25)

$z_{G,x,t}^t$ follows an AR(1):

$$
\begin{align*}
z_t^G &= \rho_x z_{t-1}^G + \xi_{x,t}^G
\end{align*}
$$

(26)

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

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