The End of Privilege: a reexamination of the Net Foreign Asset Position of the United States

Andrew Atkeson
UCLA
Jonathan Heathcote and Fabrizio Perri
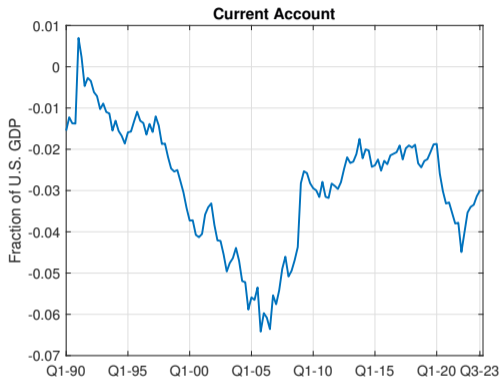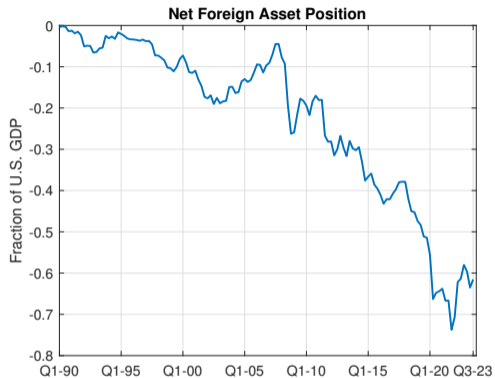FRB Minneapolis

**National**Bank
OF BELGIUM

Eurosystem

May 2024

US NFA and CA

Net Foreign Asset Position

Current Account

▷ NFA = *Net wealth of US residents* (hholds + institutions) = Mkt value of claims of US residents on foreigners - claims of foreigners on US residents: prime example of *global imbalance*

▷ CA = Net borrowing/lending of US residents v/s foreigners

Part 1: What drives the large and persistent NFA decline?
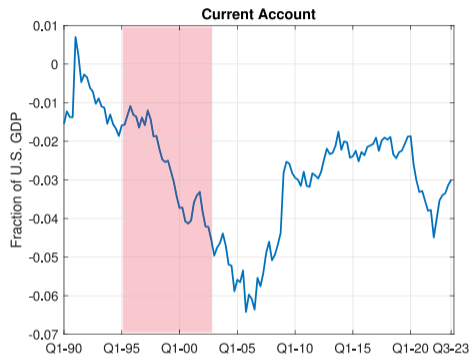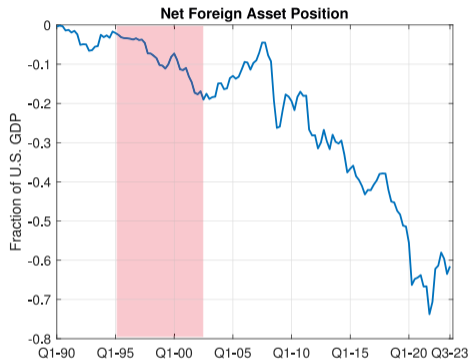

▷ Original theories of NFA emphasized current account

  ▷ NFA dynamics reflect borrowing/lending (CA)

Part 1: What drives the large and persistent NFA decline?
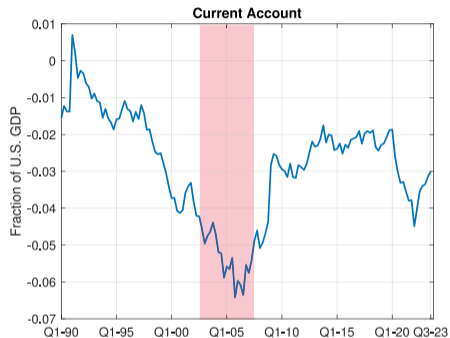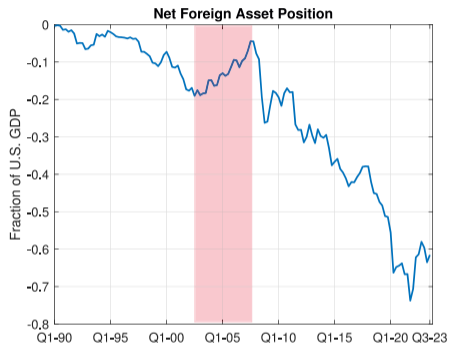
Net Foreign Asset Position

Current Account

▷ Original theories of NFA emphasized current account

  ▷ NFA dynamics reflect borrowing/lending (CA)

  ▷ but post 2002 CA and NFA disconnected..

Part 1: What drives the large and persistent NFA decline?
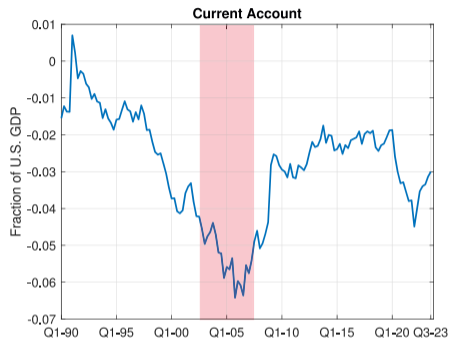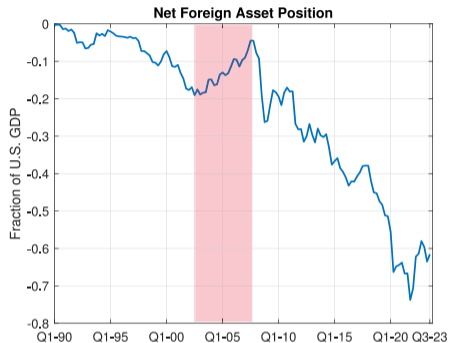
Net Foreign Asset Position

Current Account

▷ Newer view recognizes valuations matter

  ▷ Gourinchas & Rey (2007) emphasized that changes in relative prices of portfolios of foreign assets/liabilities can induce adjustment in NFA

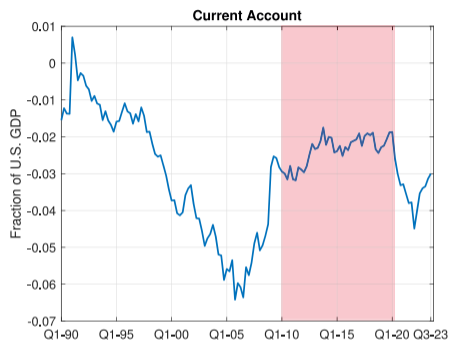 ▷ US ran substantial CA deficits in the 2000s without blowing up its NFA (privilege)

Part 1: What drives the large and persistent NFA decline?
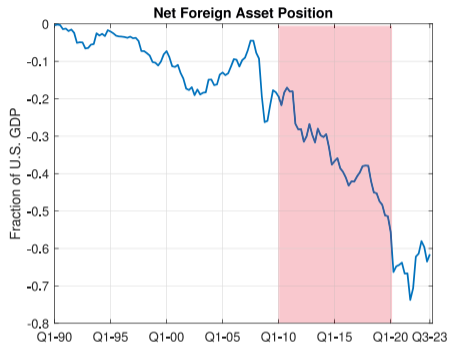

- ▷ Newer view recognizes valuations matter

  - ▷ Gourinchas & Rey (2007) emphasized that changes in relative prices of portfolios of foreign assets/liabilities can induce adjustment in NFA

  - ▷ US ran substantial CA deficits in the 2000s without blowing up its NFA (privilege)

  - ▷ but post GFC modest CA deficits + rapidly deteriorating NFA (end of privilege)

The end of privilege

▷ Post GFC: What Happened?

▷ Large and persistent boom in value of US corporations (relative to foreign), and large and persistent increase in equity gross positions

▷ The End of Privilege (ex-post)

  ▷ Very large decline in US Net Wealth despite smaller US borrowing
  ▷ International Income Puzzle and Ex-ante Privilege

Part 2: What does this mean for Americans?

▷ What drove the boom in value of US corporations?

  ▷ Lower discount factor? Faster growth? Bigger profits?

▷ Explore open economy macro-finance model

  ▷ Builds on Farhi & Gourio (2018), Greenwald, Lettau & Ludvigson (2019), Eggertsson, Robbins & Wold (2022), Crouzet & Eberly (2021) and others

  ▷ Extend model to include implications for US current account and NFA

  ▷ Estimate lots of time-varying structural parameters to replicate all flows, stocks, and asset values for the US corporate sector, plus the path for the US current account and NFA position

Part 2: Results

- ▷ "Reduced form" evidence on valuations

  - ▷ Large increase in free cash flow to owners of U.S. corporations (markups? taxes?)
  - ▷ Valuation multiple fairly stable

- ▷ Model driven results

  - ▷ Integrating CA in model identifies roles of discounting v/s payouts in asset valuation
  - ▷ Rising "output wedge" between revenue and cost key driver of boom in payouts and valuation

- ▷ Welfare implications for US residents

  - ▷ Nearly zero absent international equity diversification
  - ▷ Large and negative (ex-post) given observed equity diversification
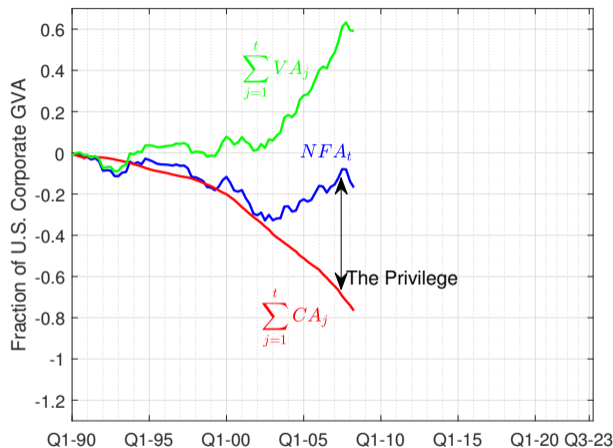 - ▷ Risk sharing implications?

Part 1: Accounting for NFA Dynamics

$$NFA_{t+1} - NFA_t = \underbrace{CA_t}_{\text{Net lending abroad}} + \underbrace{VA_t}_{\text{Valuation Effects}}$$

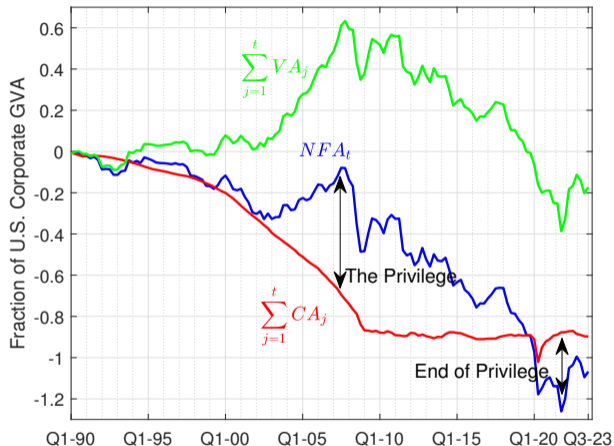$$VA_t = USFA_t \times g_{P*}^{t,t+1} - USFL_t \times g_P^{t,t+1}$$

▷ Iterating yields

$$NFA_t - NFA_0 = \underbrace{\sum_{j=0}^{t} CA_j}_{\text{Cumul. net lending}} + \underbrace{\sum_{j=0}^{t} VA_j}_{\text{Cumul. valuations}}$$

The Privilege

Figure showing "Fraction of U.S. Corporate GVA" on the y-axis against quarterly time from Q1-90 to Q3-23. Three curves are plotted: $\sum_{j=1}^{t} VA_j$ (green), NFA_t (blue), and $\sum_{j=1}^{t} CA_j$ (red). A vertical arrow labeled "The Privilege" marks the gap between NFA_t and $\sum_{j=1}^{t} CA_j$ around Q1-05.

▷ Pre 2010: US run substantial CA deficits, yet NFA did not decline much due to positive valuation effects (Gourinchas and Rey, 2007)

Statistical Discrepancy

The Privilege and its end

▷ Post 2010: US $Cum(CA)/Y$ stabilizes, negative valuation effects drive decline in NFA

Digging into valuation effects

$$VA_t = USFA_t \times g_{P*}^{t,t+1} - USFL_t \times g_P^{t,t+1}$$

▷ To observe large valuations need:

1. Large gross positions, $USFA_t$, $USFL_t$
2. If gross positions are balanced: differences in asset price changes $g_P^{t,t+1}$ and $g_{P*}^{t,t+1}$
3. If gross positions unbalanced: large asset price changes $g_P^{t,t+1}$ and $g_{P*}^{t,t+1}$

Large Gross Positions

U.S. owned assets abroad

Foreign owned assets in the U.S.
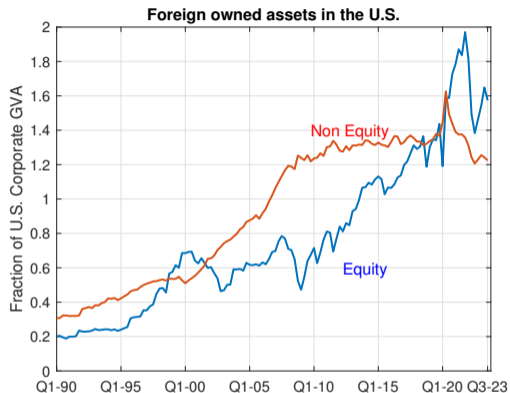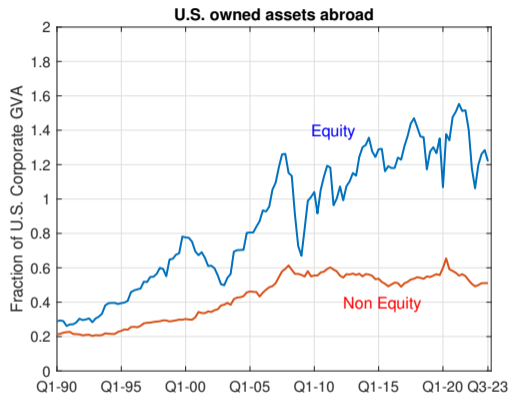
▹ In recent years both equity and non equity positions are large!

▹ In 2010 value of US equity owned by foreigners $\simeq$ 100% of US Corporate GVA

▹ Equity (portfolio and FDI) is more balanced, non-equity more unbalanced

Issue with measuring gross positions

10

Net Cumulated Valuations Effects

Cumulated net valuation changes
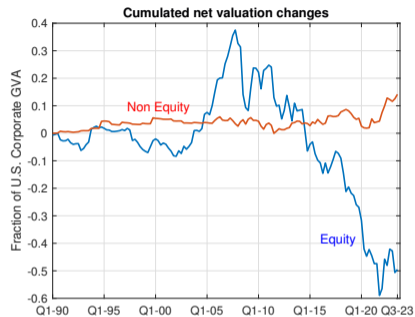
- ▷ Large change in values of equity (both large positions and relative price changes)

Net Cumulated Valuations Effects


Cumulated net valuation changes
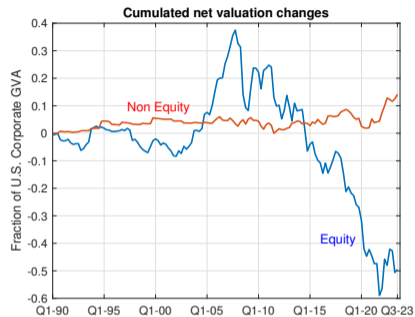
- ▷ Large change in values of equity (both large positions and relative price changes)
- ▷ Small change in values of non-equity (bonds, currency, etc) except in 2021-2022 (common fall in bond prices with unbalanced bond positions)
  - ▷ Small relative prices changes as bonds held by US abroad mostly $ denominated: Maggiori et al. (2020)

Portfolio and FDI equity

The importance of large gross positions

Net Equity Valuations
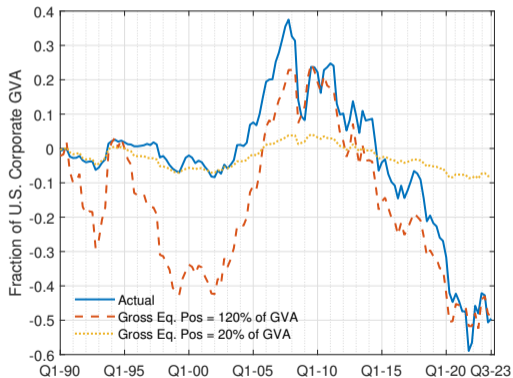
What drives the changes in relative price of equity
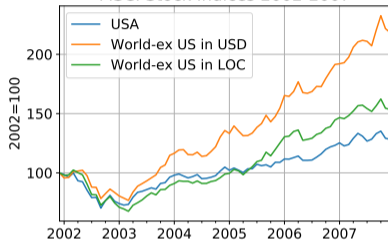
Two key candidate drivers
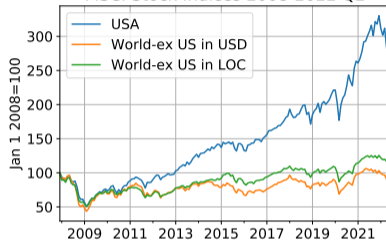
  ▷ Exchange rates

  ▷ Stock prices

Two valuation episodes

MSCI Stock Indices 2002-2007

MSCI Stock Indices 2008-2022 Q2

▷ 2002-2007: Equity valuations favor US, USD depreciation important

▷ 2008-2022Q2: Equity valuations against US, mostly driven by US stocks outperforming foreign stocks

Two valuation episodes
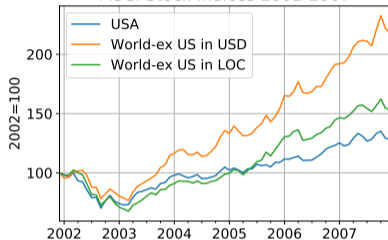

MSCI Stock Indices 2002-2007
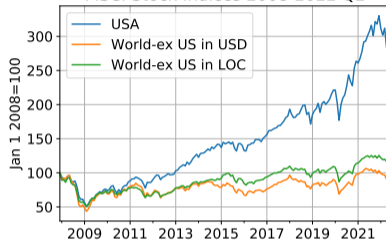
MSCI Stock Indices 2008-2022 Q2

- ▷ 2002-2007: Equity valuations favor US, USD depreciation important

- ▷ 2008-2022Q2: Equity valuations against US, mostly driven by US stocks outperforming foreign stocks

- ▷ Direct estimate of exchange rate effects on NFA/Y (using BEA data):
  - ▷ USD depreciation accounts for 40% of positive equity reval in 2002-2007
  - ▷ USD appreciation accounts for 20% of negative equity reval in 2010-2021

Equity v/s Non Equity Summary
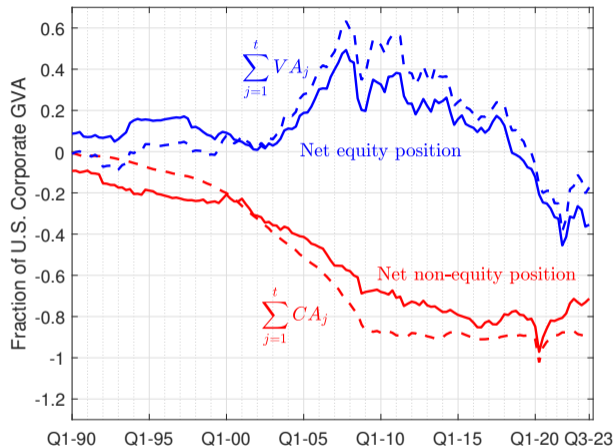
▷ Current account mostly financed by non-equity flows

▷ Equity position mostly driven by changes in equity valuations

15

NFA Dynamics Summary

▷ US NFA position fell from -20% of GDP in 2010 to -62% in 2023

▷ Current account deficits accounted for only around 10pp of this decline

▷ Dominant driver (35pp) was equity revaluation effects

▷ In turn reflecting strong relative performance of US equities, coupled with large international gross equity positions

income puzzle and expected privilege

Part 2: What Drives Rising US Asset Values?

❶ Rising profitability of US corporations

> ▷ Farhi and Gourio (2018), Eggertson, Robbins, Wold (2021), Crouzet and Eberly (2021)
> ▷ Greenwald, Lettau, Ludvigson (2020): *"the considerable gains to holding equity over the post-war period can be in large part attributed to an unpredictable sequence of factor share shocks that reallocated rewards to shareholders"*
>
> ▷ De Loecker, Eeckhout, Unger (2020), Akcigit et al. (2021), Philippon (2019) evidence on rising market power
>
> ▷ Barkai (2020), Karabarbounis, Neimann (2014, 2019) evidence on decline in labor share, rise in factorless income
>
> ▷ Gutierrez and Philippon (2017) evidence on weak investment growth, notwithstanding low interest rates

❷ Changing Discount Factors and Expected Growth Rates

Analytical Quantitative International Macro Finance Model

▷ Two countries, US and ROW

▷ Firms make profits $\Rightarrow$ equity values reflect value of capital plus expected future profits

▷ Households trade equity and bonds

▷ ROW preferences linear — pins down r_{t+1}^* for world

▷ Calibrate to match US corporate sector flows, stocks and valuations + ROW enterprise value and cash flow + US current account

▷ What drives valuations?

▷ How do changing valuations affect
  1. Current Account and NFA position?
  2. Welfare?

Production firms

▷ Final output is CES composite of intermediate varieties

$$Y_t = \left(\int_0^1 Y_{it}^{\frac{\varepsilon-1}{\varepsilon}} \, di \right)^{\frac{\varepsilon}{\varepsilon-1}}$$

▷ Each variety i can be produced by
  - ▷ single leader firm with productivity z_{Ht}
  - ▷ competitive fringe of followers with productivity z_{Lt}

$$Y_{it} = z_t K_{it}^{\alpha_t} (Z_t L_{it})^{1-\alpha_t}$$

▷ Firms rent capital at rate R_t and labor at rate W_t

▷ Time-varying share of capital in costs α_t

▷ Growth in labor productivity Z_t from t to $t+1$ at rate g_{t+1}

▷ Expected growth in labor productivity Z_{t+1} from $t+1$ at $\bar{g}_{t+1}$

▷ Tax rate τ_t on output

Production and capital firms

▷ Leader production firms produce all output in equilibrium

▷ Gross markups are given by $\mu_t = \min\left\{\frac{\varepsilon}{\varepsilon-1}, \quad \frac{z_{Ht}}{z_{Lt}}\right\}$

▷ Assume $\mu_t = \frac{z_{Ht}}{z_{Lt}}, \mu_t^* = \frac{z_{Ht}^*}{z_{Lt}^*}$: leaders engage in limit pricing:

  ▷ produce enough to drive p_i down to followers' unit cost, discourage entry
  ▷ Markup can increase if $z_H \uparrow$ or if $z_L \downarrow$
  ▷ In first case markup correlated with productivity, in second case not

▷ Capital firms make investment decisions and rent out capital

$$\max_{\{K_{t+1}\}} \mathbb{E}_0 \sum_{t=0}^{\infty} \frac{1}{(1+r_{t+1}^*)^t} \left[R_t K_t + (1-\delta_t)Q_t K_t - Q_t K_{t+1}\right]$$

  ▷ δ_t is depreciation rate
  ▷ Q_t, Q_t^* is price of new capital

Households

▷ US preferences

$$E \sum_{t=0}^{\infty} \left(\frac{1}{1+\rho} \right)^t \log(C_t)$$

▷ ROW preferences: risk neutral, discount factor $\rho^*_{t+1} \Rightarrow r^*_{t+1} = \rho^*_{t+1}$

▷ US households hold shares λ_{t-1} and λ^*_{t-1} of domestic and foreign firms

▷ Trade risk free bonds internationally that pay r^*_t

$$C_t + B_{t+1} + (\lambda_t - \lambda_{t-1})V_t + (\lambda^*_t - \lambda^*_{t-1})V^*_t =$$
$$W_t L_t + (1 + r^*_t)B_t + \lambda_{t-1}D_t + \lambda^*_{t-1}D^*_t$$

▷ Set λ_t and λ^*_t to match observed equity holdings. ROW share of US Equity

Expectations (repeated surprises)

▷ For r_t^*, α_t, μ_t, μ_t^*, δ_t, τ_t:

  ▷ assume perfect foresight at t regarding $t+1$ values (no risk)
  ▷ agents expect no changes from $t+1$ onward

▷ Productivity growth:

  ▷ perfect foresight for g_{t+1} between t and $t+1$
  ▷ expect growth at rate $\bar{g}_{t+1}$ from $t+1$ onward

▷ Expect Q_t and Q_t^* constant from date t onward

▷ Important for analytical solution

Equilibrium Factor Shares, Earnings, and Dividends

▷ Firm FOCs plus symmetry across varieties gives factor income shares

$$
\begin{aligned}
\frac{R_t K_t}{Y_t} &= (1 - \tau_t)\frac{\alpha_t}{\mu_t} \\
\frac{W_t L_t}{Y_t} &= (1 - \tau_t)\frac{1 - \alpha_t}{\mu_t}
\end{aligned}
$$

▷ Rest of output is monopoly profits (factorless income)

$$
\frac{\Pi_t}{Y_t} = (1 - \tau_t)\frac{\mu_t - 1}{\mu_t}
$$

▷ Optimal investment (given $\mathbb{E}_t Q_{t+1} = Q_t$)

$$
R_{t+1} K_{t+1} = (r_{t+1}^* + \delta_{t+1}) Q_t K_{t+1}
$$

▷ Dividends and Earnings

$$
\begin{aligned}
D_t &= (1 - \tau_t) Y_t - W_t L_t - I_t \\
E_t &= (1 - \tau_t) Y_t - W_t L_t - \delta_t Q_t K_t
\end{aligned}
$$

Asset Values

▷ Firm value is discounted present value of dividends

$$V_t = \sum_{j=1}^{\infty} \frac{D_{t+j}}{(1 + r_{t+1}^*)^j} = \frac{E(D_{t+1})}{r_{t+1}^* - \bar{g}_{t+1}}$$

▷ Equals capital stock plus discounted value of monopoly profits

$$V_t = Q_t K_{t+1} + \frac{\Pi_{t+1}}{(r_{t+1}^* - \bar{g}_{t+1})}$$

Measuring Valuations and Cashflow

▷ Measure enterprise value V of US corporate sector: total market value of corporate non-financial assets

▷ Match that to free cash flow D of US corporate sector: total income that can be paid to investors

▷ Use Flow of Funds to measure V; NIPA to measure D

Corporate Sector Balance Sheet	
Assets	Liabilities
Enterprise value V	Market value of equity
Financial assets	Financial liabilities (debt, bank loans etc)

▷ D = GVA - Wages - Corp. Taxes - IBT - Investment

▷ E = GVA - Wages - Corp. Taxes - IBT - CFC

Advantages of Measurement Approach

▷ D_t straight from National Income accounts

    ▷ Long time series

▷ V_t for same firms for which we measure D_t

    ▷ Entire corporate sector, not just publicly traded firms

▷ D_t measure insensitive to what firms do with profits

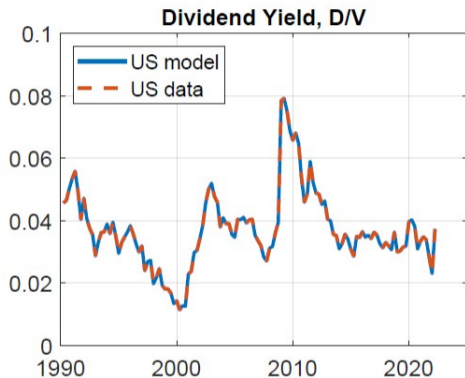   ▷ pay dividends vs buy back shares vs pay off debt vs acquire financial assets

Enterprise Value and Capital: US Corporate Sector
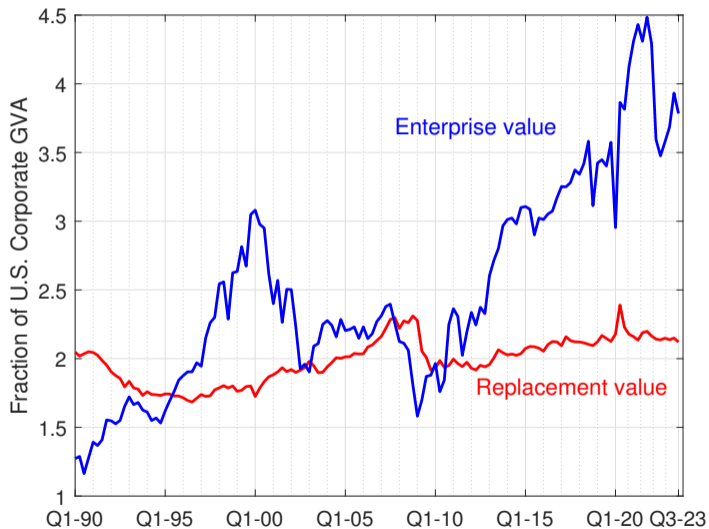
Free Cash Flow D, US Corporate Sector
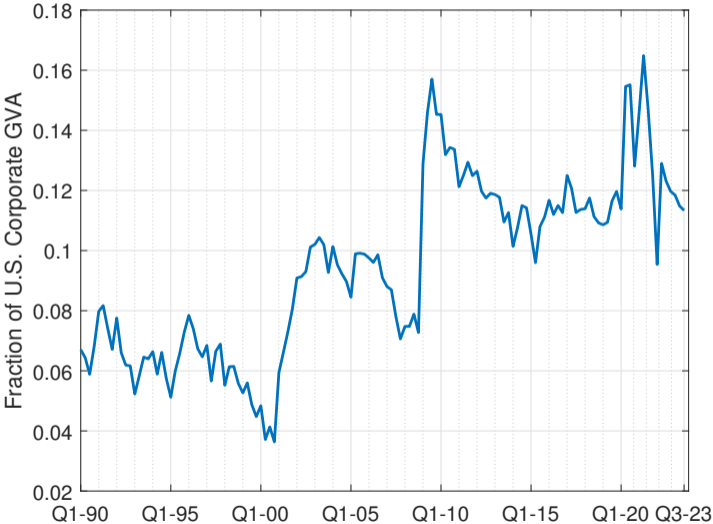
Free Cash Flow and Earnings to Enterprise Value, US Corp. Sector

Dividend Yield, D/V

US model
US data

Earnings Yield, E/V

US model
US data
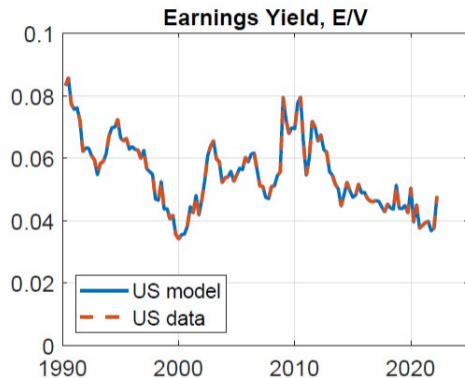
▷ No trend in dividend yield D_t/V_t

▷ Decline in earnings yield E_t/V_t

US Current Account

- ▷ Corporate savings equals investment, gov't savings equals zero

- ▷ Households have log utility over consumption, exogenous labor supply

- ▷ Consume fraction $(1 - \beta)$ of total wealth

- ▷ $\implies$ Household Savings and Current Account

$$CA_t = Income_t - \frac{\rho}{1 + \rho} Wealth_t$$

$$Income_t = r_t^* B_t + \lambda_{t-1} D_t + \lambda_{t-1}^* D_t^* + W_t L_t$$

$$Wealth_t = Income_t + B_t + \lambda_{t-1} V_t + \lambda_{t-1}^* V_t^* + H_t$$

- ▷ H_t is discounted present value of labor income from $t + 1$ on

What Drives the Current Account?

▷ Implies

$$(1 + \rho)CA_t = \underbrace{\lambda_{t-1}\left(\frac{D_t}{V_t} - \rho\right) V_t}_{\text{US Equity}} + \underbrace{\lambda_{t-1}^*\left(\frac{D_t^*}{V_t^*} - \rho\right) V_t^*}_{\text{ROW Equity}} +$$

$$\underbrace{(r_t^* - \rho)B_t}_{\text{Net Non-Equity}} + \underbrace{\left(\frac{W_t L_t}{H_t} - \rho\right) H_t}_{\text{Human Wealth}}$$

$$H_t = \frac{W_{t+1} L_{t+1}}{r_{t+1}^* - \bar{g}_{t+1}}$$

▷ Quantitatively: H_t most important determinant, human wealth important determinant of consumption/saving decisions

▷ Stable current account implies that $r_{t+1}^* - \bar{g}_{t+1}$ cannot move much

Baseline parameters estimates
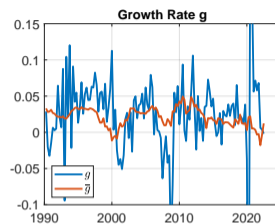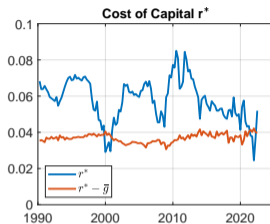
▷ Key structural findings: stable $r^* - \bar{g}$, declining $\bar{g}$ and r^*, increasing output wedge μ

Identifying moments

▷ $\frac{D}{V} = r^* - \bar{g}, \quad V = QK + \frac{\Pi}{(r^* - \bar{g})} \quad \frac{V}{Y} = \frac{QK}{Y} + \frac{\Pi}{Y}\frac{1}{(r^* - \bar{g})}$

▷ Increasing $\frac{V}{Y}$ ratio, value of corporate sector

▷ Constant $\frac{QK}{Y}$ ratio, it is not capital

▷ Constant $\frac{D}{V}$ ratio, it is not lower $r^* - \bar{g}$ but higher profits

▷ Small current account movements, additional evidence against lower $r^* - \bar{g}$

▷ Declining $\frac{E}{V}$ ratio: identifies aggregate growth (given $\frac{K}{V}$)

$$\frac{E - D}{V} = \frac{X - \delta K}{V} = g\frac{K}{V}$$

Additional moments

Free Cash Flow US Corporate Sector Back to 1929
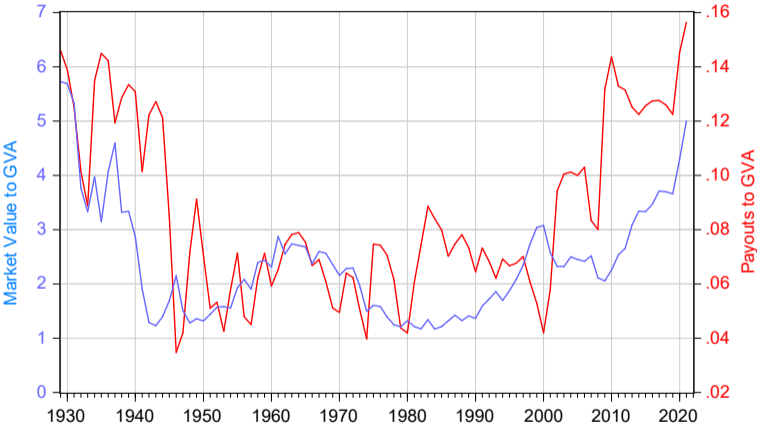
▷ Atkeson, Heathcote and Perri, 2024

Enterprise Value in ROW has not Risen
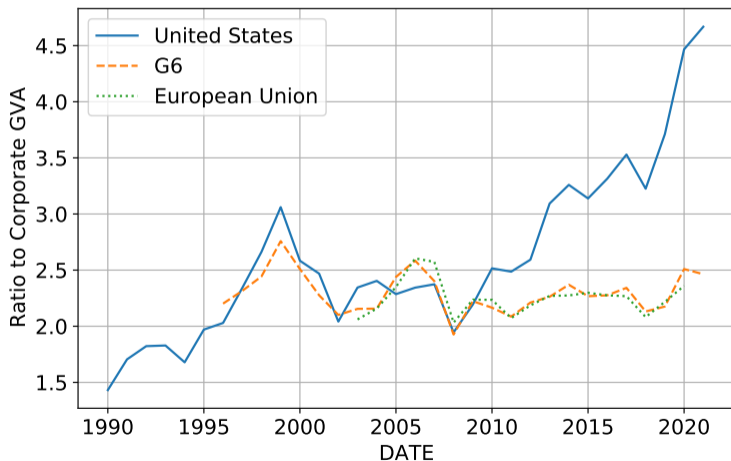
Free Cash Flow in ROW has not Risen
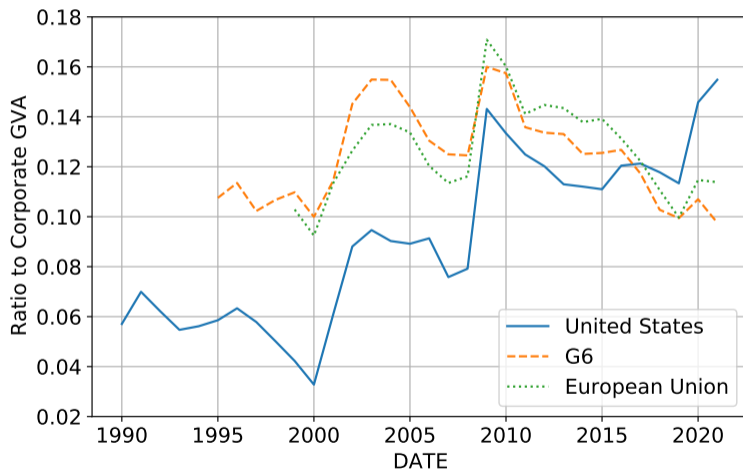
Current equity boom looks different
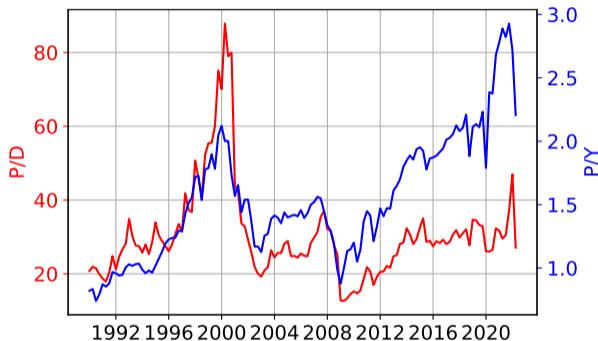
▷ dot-com boom: large increase in P/D ratio

▷ current boom: constant P/D ratio, justified by higher dividends

Counterfactuals for Welfare

▷ How did the rise in μ_t impact U.S. welfare?

▷ How does the welfare impact depend on equity diversification?

▷ Model with all the same parameters except $z_{Lt} \equiv z_{Ht}$ so $\mu_t \equiv 1$

  ▷ Solve with λ_t and λ_t^* as in the data

  ▷ Solve with $\lambda_t \equiv 1$ and $\lambda_t^* \equiv 0$ (no diversification)

▷ Solution for flows, stocks, and valuation of U.S. corporate sector independent of diversification

▷ Solution for U.S. consumption depends on diversification

Counterfactuals
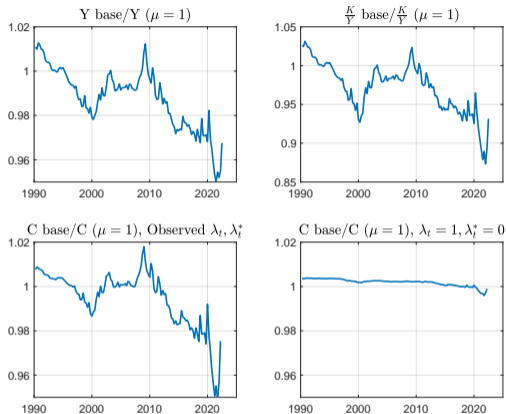
- ▷ US output, investment, wages all decline when output wedge increase
- ▷ With diversification US consumption also decline
- ▷ Without diversification US consumption declines much less, wage loss compensated by higher dividends: welfare losses of higher output wedge (in RA set-up)

Mark-ups, diversification and ex-ante welfare (risk sharing)

▷ Baxter and Jermann (1997), Heathcote and Perri (2013),
  Coeurdacier, Kollman, Martin (2007)

▷ Whether the transfer from US to ROW is good for risk sharing (desirable ex-ante) depends on
  why wedge $\mu_{t+1} = \frac{z_H}{z_L}$ moves

  ▷ If followers become less productive ($z_L \downarrow$), shock bad for US as a whole, diversification worsens risk
    sharing

  ▷ If initial $\mu_t = 1$, can show optimal portfolio (in response to z_L shocks) has no equity diversification

▷ If μ increases because z_H rises (Amazon), then diversification improves risk sharing

▷ US transfers resources abroad when it is relatively more productive

Conclusions

▷ Large cross border equity positions imply *relative* stock market performance big driver of NFA through direct valuation effects

▷ Integrated Model of Corporate Sector, CA, and NFA positions

▷ Quantitative model of flows and asset values in international economy

  ▷ points to big increase in "output wedge" as key driver of asset boom

  ▷ absent international diversification, small impact on U.S. welfare

  ▷ with observed diversification, big impact on U.S. welfare

▷ Model of links between asset valuations and NFA

Decomposing the increase in payouts
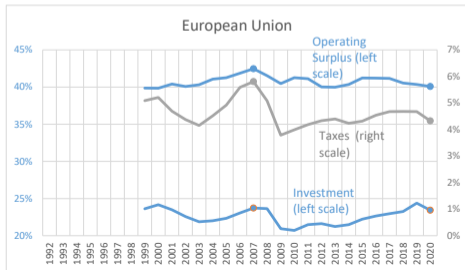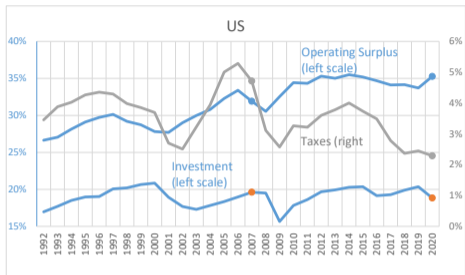
Other Issues

▷ Income Puzzle and Ex-Ante Privilege go

  ▷ Curcuru, Thomas, and Warnock (2013) express skepticism on this point

  ▷ Income puzzle mainly due to FDI accounting profits not actual payments

▷ Unmeasured Capital Corrado et. al. estimates

  ▷ Corrado, Haskell, Jona-Lassino and Iommni 2022 JEP and linked data

  ▷ Intangible investment and capital are large

  ▷ But they show no trend from 1997 to 2021

  ▷ So hard to account for the rise in free cash flow and valuations

  ▷ Also hard to account for smooth growth in measured output if there were a big burst of investment in unmeasured intangibles

Cumulated Net Valuations in FDI and Portfolio Equity
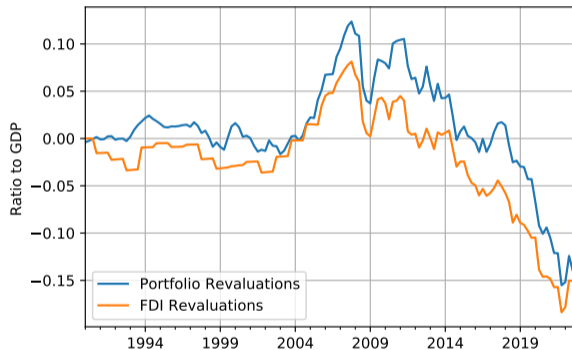
▷ Large valuations changes both in FDI and portfolio investments `back`

Impact of FDI equity valuations on NFA position
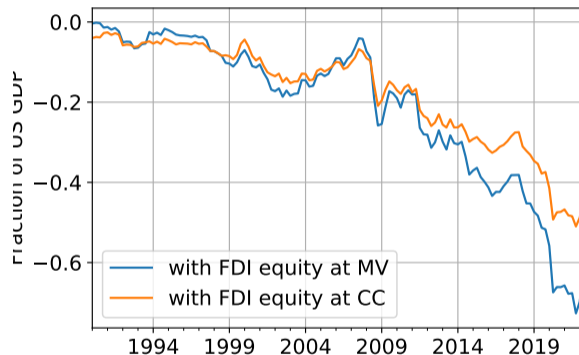
▷ FDI equity valuations add -20% to NFA position back

S&P500 Dividends and Yields

S&P 500 INDEX AND DIVIDEND YIELD
(ratio scale)

S&P 500 Index
03/15/23
S&P 500 Blue Angels
Implied Price Index*

yardeni.com
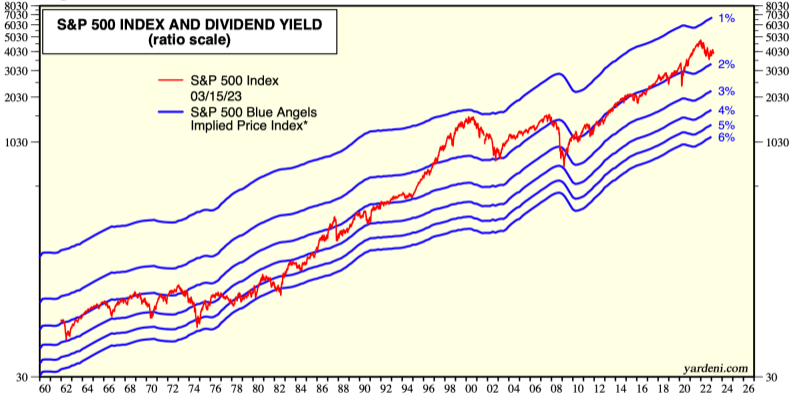
* Blue lines show hypothetical values of S&P 500 stock price index using actual S&P 500 dividend (4-quarter trailing sum) divided by dividend yields from 1% to 6%.
Source: Standard & Poor's.

back

Alternative measures of net lending abroad
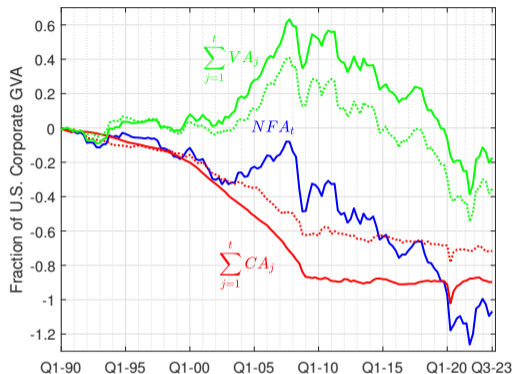
- ▷ Discrepancy between two ways of measuring net lending abroad: current or financial account
- ▷ Changes the decomposition between cumulated *CA* and cumulated *VA*
- ▷ Similar conclusions regarding end of privilege

back

International Income Puzzle and Ex-Ante Privilege

▷ NFA evolution contrasts with Net Factor Income from abroad: negative declining NFA, positive stable NFI
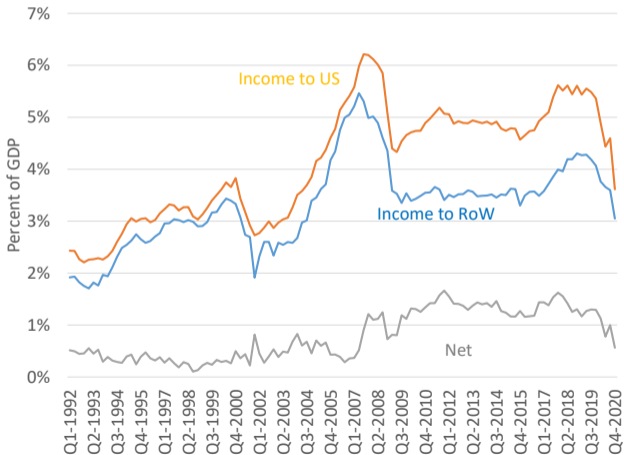
International Income Puzzle and Ex-Ante Privilege

▷ Are "Safe Assets" special?

    ▷ Currency, Bank deposits, US Treasuries

    ▷ average income yields on US non-equity external assets and liabilities are similar `implicit interest rates`

▷ Extraordinary "income yield" on US Direct Investment Equity Assets in ROW `implicit DI yields`

    ▷ *Dark Matter?* (is value of DI equity in ROW understated)

    ▷ *Profit Shifting?* (about 1/3 of DI equity income is in tax havens)

▷ Positive US Net Income despite negative Net Assets almost entirely due to DI equity asset income yield and small gap in dividend yields on portfolio equity assets and liabilities `implicit PI yields` `back to other issues`

Implicit Income Yields on Non-Equity External Assets and Liabilities

Implicit Yields on Non-Equity Assets and Liabilities

back
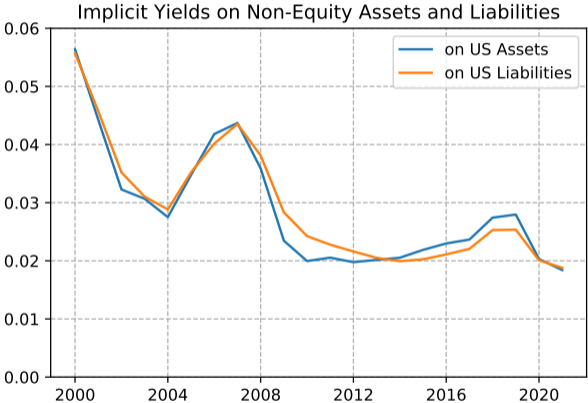
Implicit Income Yields on DI Equity External Assets and Liabilities

Implicit Yields on FDI Equity Assets and Liabilities
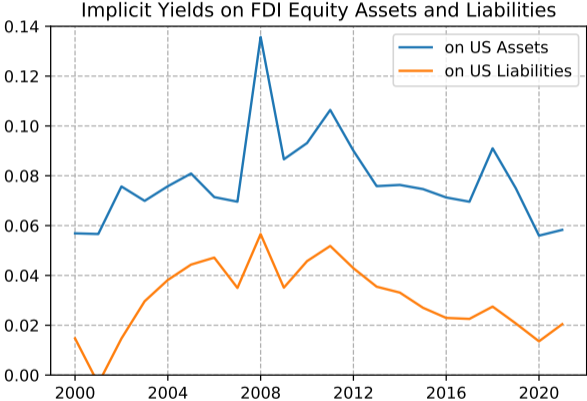
# Implicit Income Yields on Portfolio Equity External Assets and Liab.

Implicit Yields on Portfolio Equity Assets and Liabilities

back
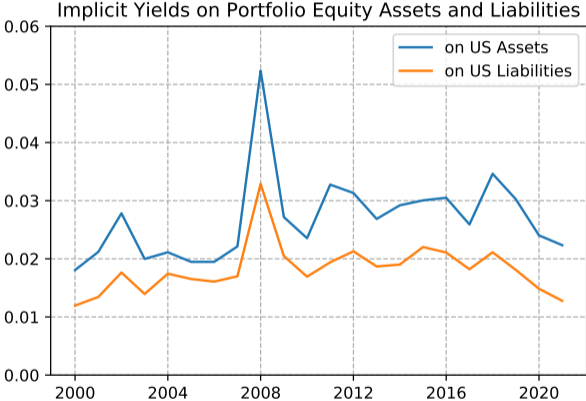
Overstatement of Gross Equity Positions

▷ Bertaut, Bressler, Curcuru 2020

▷ Corporate Inversions, e.g. Medtronics incorporates in Ireland

  ▷ *BEA*: Foreign equity, *MSCI*: US equity
  ▷ Medtronics owning assets (i.e. plants) in US adds to gross foreign holdings of US equity
  ▷ US residents holdings of Medtronics adds to US gross holdings of foreign equity

▷ Offshore funds

  ▷ *Cayman fund holdings of US equity* add to gross foreign holding of US equity
  ▷ *Cayman fund Shares held by US residents* add to US gross holdings of foreign equity

▷ In both cases economically it is US holdings of US equity

▷ Overstates gross positions and Δ in net positions due to Δ in US equity values

▷ Using revised estimates of US gross positions: changes in US NFA still large

back

ROW Equity Share of US Corporate Enterprise Value
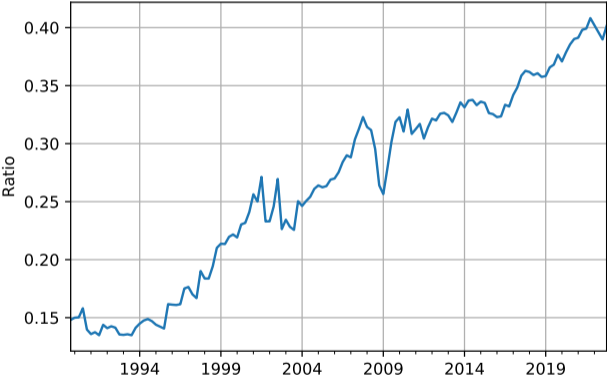
Dividend Yield (paid) on US Equity in ROW
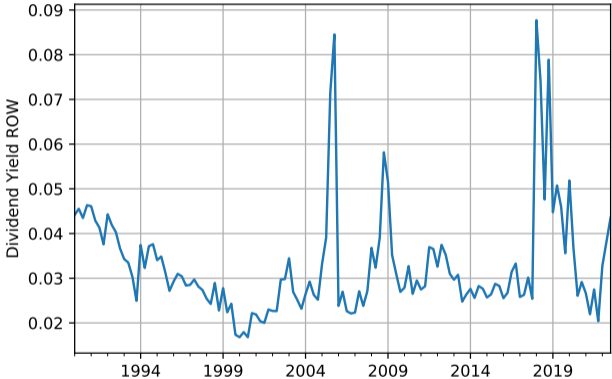
Expected and Unexpected Drivers of NFA

$$NFA_t - NFA_{t-1} = CA_{t-1} + \lambda_{t-1}^* \left(V_t^* - V_{t-1}^* \right) - (1 - \lambda_{t-1})\left(V_t - V_{t-1} \right)$$

▷ What movements occur when parameters turn out as expected vs. deviations due to unexpected shocks?

▷ Excess Returns

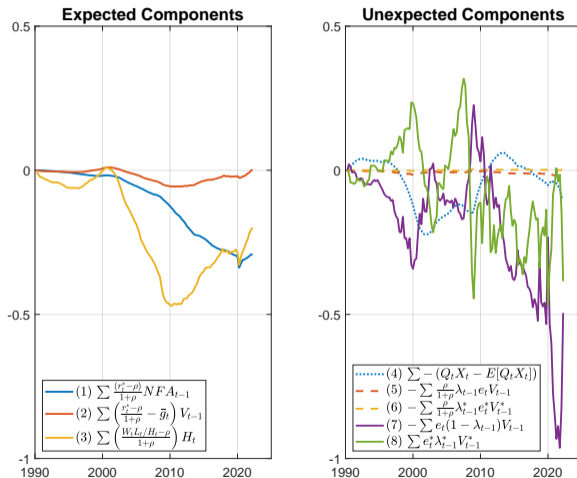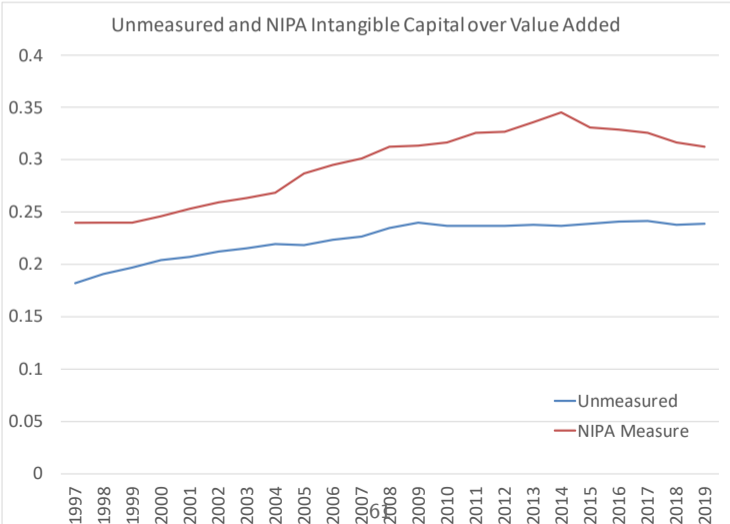$$e_t = \frac{D_t + V_t}{V_{t-1}} - (1 + r_t^*), \qquad e_t^* = \frac{D_t^* + V_t^*}{V_{t-1}^*} - (1 + r_t^*)$$

Expected and Unexpected Drivers of NFA

$$
\begin{aligned}
NFA_t - NFA_{t-1} \;=\; & \underbrace{\frac{r_t^* - \rho}{1+\rho} NFA_{t-1}}_{(1)} \\[2mm]
& + \underbrace{\left(\frac{r_t^* - \rho}{1+\rho} - \bar{g}_t \right) V_{t-1}}_{(2)} + \underbrace{\left(\frac{\frac{W_t L_t}{H_t} - \rho}{1+\rho} \right) H_t}_{(3)} \\[2mm]
& - \underbrace{\left(Q_t X_t - \mathbb{E}_{t-1}[Q_t X_t] \right)}_{(4)} \\[2mm]
& - \underbrace{\frac{\rho}{1+\rho} \lambda_{t-1} e_t V_{t-1}}_{(5)} - \underbrace{\frac{\rho}{1+\rho} \lambda_{t-1}^* e_t^* V_{t-1}^*}_{(6)} \\[2mm]
& - \underbrace{e_t(1 - \lambda_{t-1}) V_{t-1}}_{(7)} + \underbrace{e_t^* \lambda_{t-1}^* V_{t-1}^*}_{(8)}
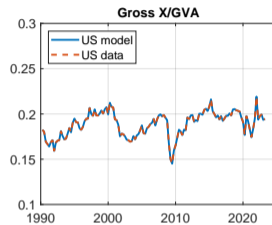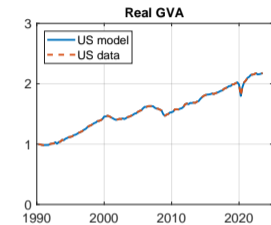\end{aligned}
$$

Expected and Unexpected Drivers of NFA
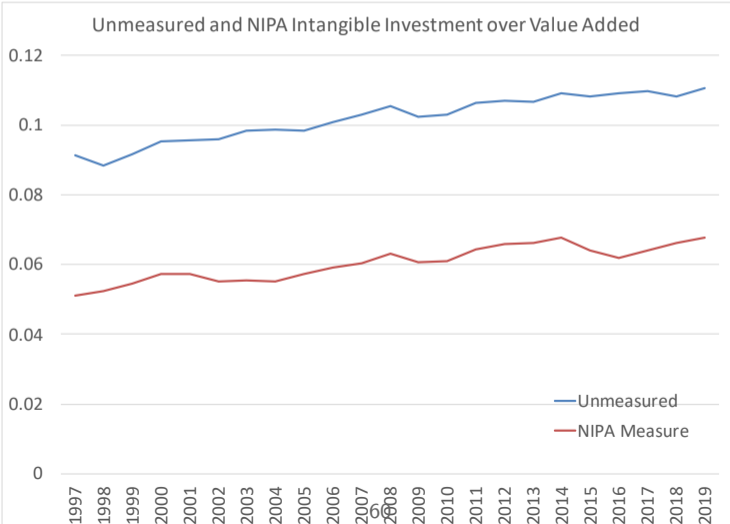
Expected Components

(1) $\sum \frac{(r_t^* - \rho)}{1+\rho} NFA_{t-1}$

(2) $\sum \left(\frac{r_t^* - \rho}{1+\rho} - \tilde{y}_t \right) V_{t-1}$

(3) $\sum \left(\frac{W_t L_t / H_{t} - \rho}{1+\rho} \right) H_t$

Unexpected Components

(4) $\sum -(Q_t X_t - E[Q_t X_t])$

(5) $-\sum \frac{\rho}{1+\rho} \lambda_{t-1} e_t V_{t-1}$

(6) $-\sum \frac{\rho}{1+\rho} \lambda_t^* e_t^* V_{t-1}^*$

(7) $-\sum e_t (1 - \lambda_{t-1}) V_{t-1}$

(8) $\sum e_t^* \lambda_{t-1}^* V_{t-1}^*$

Unmeasured and NIPA Intangible Investment over Value Added

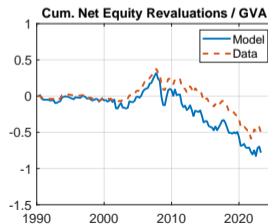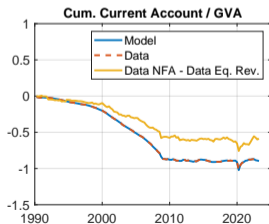Unmeasured and NIPA Intangible Capital over Value Added
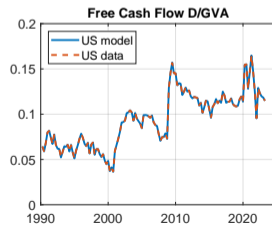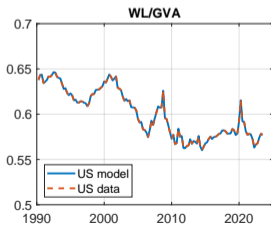
Baseline Results
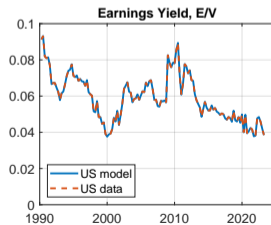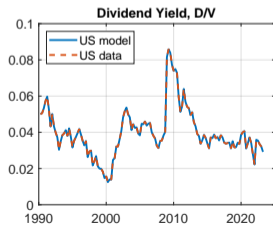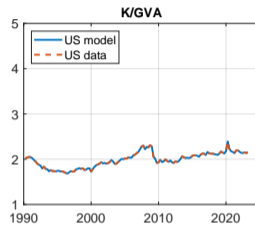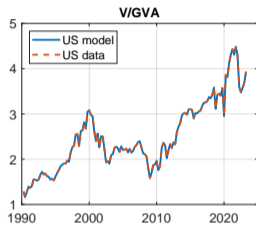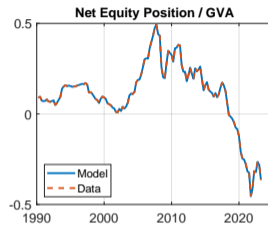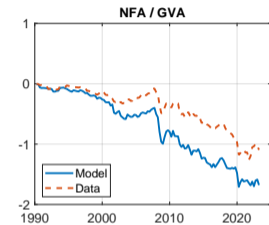
Baseline Results
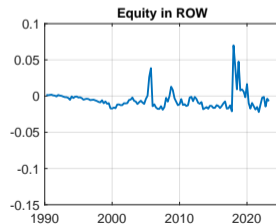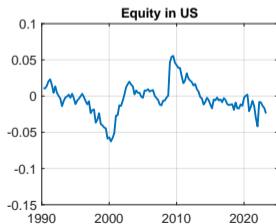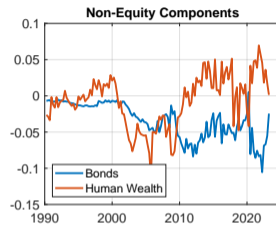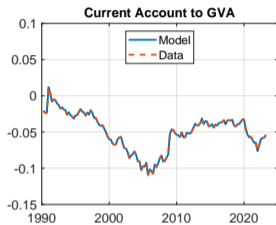
Baseline Results

Baseline Results

US Equities and US Corporate Sector

▷ Looking into the strong performance of US Equities

▷ Assume US equities are claims to cash flow of US corporate sector

What Drives the Current Account?

$$(1+\rho)CA_t = \underbrace{\lambda_{t-1}\left(\frac{D_t}{V_t} - \rho\right)V_t}_{\text{US Equity}} + \underbrace{\lambda_{t-1}^*\left(\frac{D_t^*}{V_t^*} - \rho\right)V_t^*}_{\text{ROW Equity}} + \underbrace{(r_t^* - \rho)B_t}_{\text{Net Non-Equity}} + \underbrace{\left(\frac{W_t L_t}{H_t} - \rho\right)H_t}_{\text{Human Wealth}}$$

▷ On BGP, $CA_t = \bar{g}B_t$

▷ Fluctuations in D_t, D_t^*, $W_t L_t$ due to cyclical fluctuations in current output and investment $\Rightarrow$

   ▷ These effects dominant in standard international business cycle models

▷ Changes in V_t, V_t^*, H_t due to changes in profits and in r_{t+1}^* and $\bar{g}_{t+1}$

   ▷ These effects small in standard international business cycle models

▷ Note: human wealth H_t is very big $\Rightarrow$ need $r_{t+1}^* - \bar{g}_{t+1}$ close to constant to avoid massive fluctuations in CA_t.

Sensitivity Analysis

▷ Closed Economy macro finance models do not use current account data

▷ Valuation multiple, the earnings yield, and Tobin's Q

$$r_{t+1}^* - \bar{g}_{t+1} = \frac{E_{t+1}}{V_t} - \bar{g}_{t+1} \frac{Q_t K_{t+1}}{V_t}$$

▷ Farhi and Gourio (2018), Crouzet and Eberly (2021) etc. make assumptions about $\bar{g}_{t+1}$ or $r_{t+1}^* - \bar{g}_{t+1}$ to "identify" r_{t+1}^*

▷ We try four alternative "identifying" assumptions

  ▷ $r_{t+1}^* - \bar{g}_{t+1}$ constant

  ▷ $\bar{g}_{t+1}$ given by HP trend

  ▷ $\bar{g}_{t+1}$ given by SPF 10 year growth forecast

  ▷ $r_{t+1}^* - \bar{g}_{t+1}$ equal realized D_{t+1}/V_t

▷ Similar r_{t+1}^* and μ_{t+1} across all five assumptions

Sensitivity Analysis