The End of Privilege: a Re-examination of the Net Foreign Asset Position of the United States

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Views expressed herein are of the authors and not necessarily of the Federal Reserve Bank of Minneapolis or the Federal Reserve System.
Over last decade unprecedented decline in Net Foreign Asset Position of the United States

- NFA = Market value of foreign assets owned by Americans - U.S. assets owned by foreigners
Part 1: Accounting for NFA Dynamics

- Original view emphasized CA as determinant of NFA
- Newer view recognizes valuations effects matter
  - Gourinchas & Rey 2007 emphasized that changes in relative prices of portfolios of foreign assets/liabilities (valuation effects) can induce adjustment in NFA
  - 1990s: United States run substantial CA deficits, yet NFA did not decline much due to positive valuation effects (our notion of privilege)
  - Post 2010: United States run modest CA deficits, yet rapidly deteriorating NFA due to negative valuations (end of privilege)
  - Key driver: boom in U.S. equities (relative for foreign)
Part 2: What does this mean for Americans?

- Use simple model + data to assess cause of U.S. equity boom
  - open economy version of Farhi and Gourio (2018)
- Preferred explanation: increase in profitability of U.S. corporations
- Implies large transfers of resources from U.S. to RoW
- Ex-post loss for U.S., ex-ante desirable?
Part 1: Accounting for NFA Dynamics

\[ NFA_{t+1} - NFA_t = CA_t + VA_t \]

- Net lending abroad
- Valuation Effects

• Iterating yields

\[ NFA_t - NFA_0 = \sum_{j=0}^{t} CA_j + \sum_{j=0}^{t} VA_j \]

- Cumul. net lending
- Cumul. valuations
Pre 2010: US run substantial CA deficits, yet NFA did not decline much due to positive valuation effects (Gourinchas and Rey, 2007)
The Privilege and its end

- Post 2010: US CA stabilizes, yet negative valuation effects drive decline in NFA
Negative Valuation effects: 2010-2021

- Valuation effects mostly in Portfolio and FDI equity
- Equity is both portfolio and direct investment equity
- Non-equity is bonds, loans, deposits, currency
Equity prices divergence

MSCI Stock Indices 2008-2021

- USA
- World-ex US in USD
- World-ex US in LOC

- Only small fraction of divergence due to USD appreciation
Equity v/s Non Equity Summary

- Current account mostly financed by non-equity flows
- Equity position driven by changes in equity valuations
US NFA position fell from -10% of GDP in 2007 to -65% in 2021

Current account deficits accounted for only 15pp of decline

Dominant driver (40pp): equity valuation effects

Reflecting strong performance of U.S. equities coupled with large (40% of GDP) foreign ownership of U.S. equity
Part 2: What does this mean for Americans?

- To answer need to understand what drives rising US equity values
- Farhi and Gourio (2018) in an international setting
- Look for shocks that match asset prices and macro data
- Implications for the NFA position? for US welfare?
Key Model Elements

• Two countries (US and RoW), one final good, continuum of intermediates produced with $K$ and $L$

• Markups: Each intermediate Bertrand competition between leader (prod $z_H$) and follower (prod $z_L$) implies markup is $\frac{z_H}{z_L}$

• Equity: claims to dividends (including capital income and mark-ups) of intermediate firms, so mark-up $\uparrow \rightarrow$ dividend $\uparrow \rightarrow$ price $\uparrow$

• Fixed internationally diversified equity portfolios. Trade in risk free bond

• Can characterize closed form solution

• U.S. specific, one time, unexpected shock on BGP:
  ▶ Increase in markups of U.S. corporations $\frac{z_H}{z_L} \uparrow$
Firms

• Final output is CES composite of intermediate varieties

\[ Y = \left( \int_0^1 Y_i^{\epsilon - 1} \frac{1}{\epsilon} \, di \right)^{\frac{\epsilon}{\epsilon - 1}} \]

• Each variety \( i \) can be produced by
  ▶ single leader firm with productivity \( z_H \)
  ▶ competitive fringe of followers with productivity \( z_L \)

\[ Y_i = z K_i^{\alpha} (ZL_i)^{1-\alpha} \]

• Firms rent capital at rate \( R \) and labor at rate \( W \)
• Capital’s share in production is \( \alpha \)
• Growth in labor productivity \( Z \) at rate \( g \)
Firms

- Leader firms produce all output in equilibrium
- Gross markups are given by
  \[ \mu = \min \left\{ \frac{\varepsilon}{\varepsilon - 1}, \frac{z_H}{z_L} \right\} \]
- Assume \( \mu = \frac{z_H}{z_L} \): leaders engage in limit pricing:
  - produce just enough to drive \( p_i \) down to followers’ unit cost, discourage entry
- Other firms make investment decisions and rent out capital
  \[ \max\{K_{t+1}\} \ E \sum_{t=0}^{\infty} \frac{1}{(1 + r^*)^t} \left[ R_t K_t + (1 - \delta)K_t - K_{t+1} \right] \]
Households

- US preferences

\[ E \sum_{t=0}^{\infty} \left( \frac{1}{1 + \rho} \right)^t u(C_t, L_t) \]

where

\[ u(C, L) = \frac{(C - Z \frac{L^{1+\sigma}}{1+\sigma})^{1-\gamma}}{1 - \gamma} \]

- GHH \( \Rightarrow \) labor supply independent of consumption

- ROW prefs: risk neutral \( \gamma^* = 0 \) \( \Rightarrow \) \( r^* = \rho^* \)
Portfolios

- US households hold fixed fractions $\lambda$ and $\lambda^*$ of domestic and foreign firms
- Trade risk free bonds internationally that pay $r^*$

$$C_t + B_{t+1} = W_t L_t + B_t + r^* B_t + \lambda D_t + \lambda^* D^*_t$$

where

$$D_t = R_t K_t + (1 - \delta) K_t - K_{t+1} + \Pi_t$$

- Equity valued at the discounted present value of dividends at world discount rate $r^*$
Equilibrium Factor Shares, Earnings, and Dividends

- Firm FOCs plus symmetry across varieties gives factor income shares

\[
\frac{R_t K_t}{Y_t} = \frac{\alpha}{\mu} \\
\frac{W_t L_t}{Y_t} = \frac{1 - \alpha}{\mu}
\]

- Rest of output is monopoly profits (factorless income)

\[
\Pi_t = \frac{\mu - 1}{\mu} Y_t
\]

- Optimal investment + FOC for labor supply

\[
R_t = r^* + \delta \\
W_t = Z_t L_t^\sigma
\]

- Dividends and Earnings

\[
D_t = Y_t - W_t L_t - I_t \\
E_t = Y_t - W_t L_t - \delta K_t
\]
Asset Values

• Firm value is discounted present value of dividends

\[ P_t = \sum_{j=1}^{\infty} \frac{D_{t+j}}{(1 + r^*)^j} \]

• Equals capital stock plus discounted value of monopoly profits

\[ P_t = K_{t+1} + \sum_{j=1}^{\infty} \frac{\Pi_{t+j}}{(1 + r^*)^j} \]
Ratios on a Balanced Growth Path

1. Buffett Ratio: \[ \frac{P}{Y} = \frac{K'}{Y} + \frac{1}{r^*-g} \frac{\mu-1}{\mu} \]

2. Capital-Output Ratio: \[ \frac{K}{Y} = \frac{1}{r^*+\delta} \frac{\alpha}{\mu} \]

   \( \Rightarrow (1)+(2) \Rightarrow \) Tobin’s Q = \( \frac{P}{K'} \)

3. Dividend-Price Ratio: \[ \frac{D'}{P} = r^* - g \]

4. Earnings-Price Ratio: \[ \frac{E'}{P} = \frac{D'}{P} + g \frac{K'}{P} \]

- Four moments to calibrate four parameters:
  \[ g, r^*, \mu, \alpha \]
Need measures of $P$, $K$, $D$, $E$

- In our simple model, firms are 100% equity financed
  $\Rightarrow P$ is total market value of non-financial assets

- Flow of Funds reports market value and replacement cost of non-financial assets in US

- Focus on corporate sector: this is what foreigners can buy

<table>
<thead>
<tr>
<th>Corporate Sector Balance Sheet</th>
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<td><strong>Assets</strong></td>
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<td>Market value of non-financial assets  =  Enterprise value</td>
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<td>Financial assets (inc. FDI in ROW)</td>
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- Model $D$ is total firm cash flow that can be paid to investors:
- $D = \text{Output} - \text{Wages} - \text{Investment} - \text{Corp. Taxes} - \text{IBT}$
Targets,

- Pick $\Delta \frac{z_H}{z_L}$ to match P,Y of U.S./RoW corporate sector
- Need US corporations less competitive but also more productive but (consistent with lots of recent work)

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Targets, Results

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- Dividends: all non invested resources available to stakeholders
- Because higher US equity prices due to high dividends, decline in NFA associated to transfers of resources of 1.3% per year
This equity boom looks different

- dot-com boom: large increase in P/D ratio
- current boom: constant P/D ratio, justified by higher dividends
Value of US corporations rose relative to GDP.

and so did dividends
Value of US corporations rose relative to value of foreign corporations.

and so did dividends
Impact of Markup Shock on NFA

- Shock consistent with NFA, CA patterns
Unmeasured capital as driver of US equity boom?

- Increased investment opportunities in unmeasured capital (Crouzet and Eberly, 2021)?
- In closed economy: iso-morphic to mark-up model
- In open economy: Implies very large current account deficit
Unmeasured capital as driver of US equity boom?

- Increased investment opportunities in unmeasured capital (Crouzet and Eberly, 2021)?
- In closed economy: iso-morphic to mark-up model
- In open economy: Implies very large current account deficit
- Americans should borrow to finance investment in unmeasured capital
- International data favors mark-up story
Unmeasured Capital Experiment

• Production requires measured and unmeasured capital

\[ Y = K_U^{1-\nu} \left( K_M^\alpha L^{1-\alpha} \right)^\nu \]

\[ Y_M = Y - I_U \]

• Valuation of firms

\[ P = K'_U + K'_M \]

• Isomorphic to markup model in closed economy
  ▶ High \( \mu \) economy looks just like high \( 1 - \nu \) economy

• But models respond differently to shocks in open economy
  ▶ \( \uparrow P/Y \) by 130% of GDP \( \Rightarrow \) huge \( \uparrow \) in investment in unmeasured capital economy
  ▶ \( \Rightarrow \) massive and counterfactual current account deficit
Conclusions

• Large decline in U.S. NFA (end of privilege) due to relative high performance of US v/s RoW equity

• Unanticipated shocks to profitability of U.S. corporations can explain post 2010 macro, financial and international trends

• Imply large transfer of resources from U.S. to RoW (about 1.3% of US GDP each year): ex-post loss

• Transfer happens as U.S. corporations more productive, possibly ex-ante efficient
Alternative measures of net lending abroad

- Statistical discrepancy between two ways of measuring net lending abroad: current or financial account
- Similar conclusions regarding end of privilege
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
  - NFA summary
Implicit Income Yields on Non-Equity External Assets and Liabilities

Implicit Yields on Non-Equity Assets and Liabilities
- on US Assets
- on US Liabilities

Graph showing implicit yields on non-equity assets and liabilities from 2000 to 2020.
Implicit Income Yields on DI Equity External Assets and Liabilities
Implicit Income Yields on Portfolio Equity External Assets and Liabilities
**S&P500 Dividends and Yields**

**Figure 2.**

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

- S&P 500 Index
- S&P 500 Blue Angels
  - Implied Price Index*

* 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.

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