The End of Privilege

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US NFA

US Net Foreign Assets over GDP
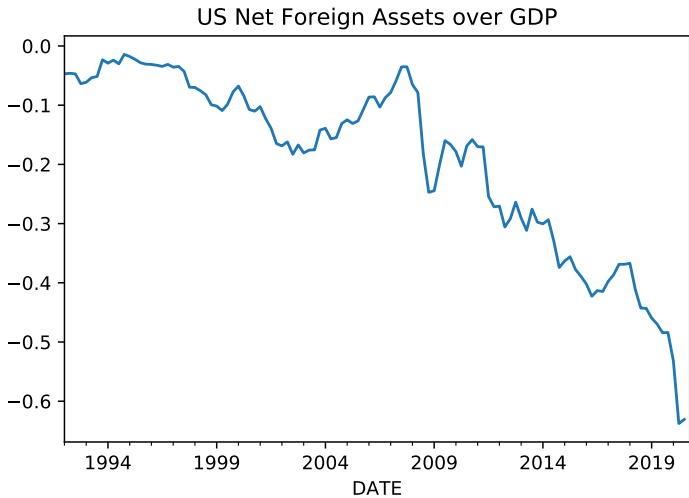
Summary of Paper

- What drove the dramatic decline in the US net foreign asset position in the last decade?

- What are the welfare implications?

- Answer to first question: not new borrowing, rather change in relative values of US assets and liabilities

- Answer to the second question: depends on why value of US assets went up

- Our (currently) preferred story: rising markups and profits for US firms

- Under that interpretation, large welfare costs associated with decline in US NFA:

    - >5 times more costly than same rise in markups would be in a closed economy

US Current Account

Net Borrowing from ROW/GDP

The End of Privilege

Cumulated Current Account and US NFA/GDP
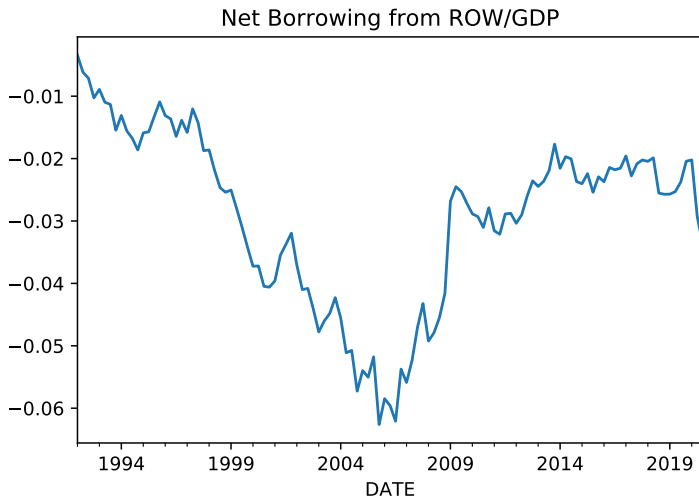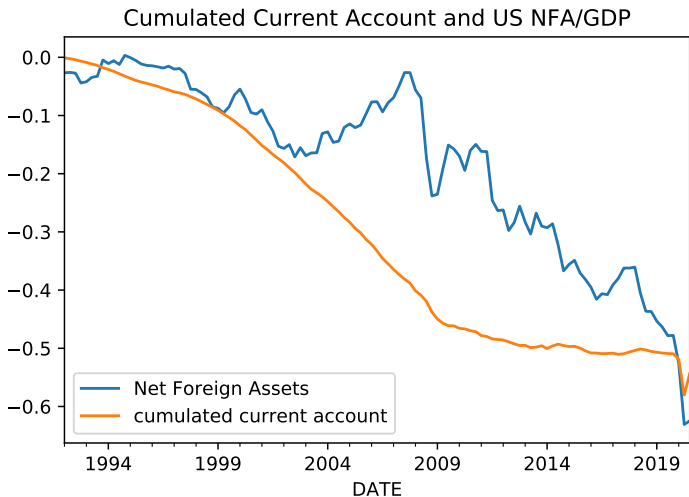
What's Going On?

- Original view emphasizes CA

    - NFA dynamics reflect national saving
    - e.g. US savings low in 1980s => current account deficits => deterioration in US NFA
    - But recently modest CA deficits + rapidly deteriorating NFA

- Newer view recognizes returns matter

    - If US consistently earns higher returns on foreign assets than it pays on liabilities
    - => run CA deficits without blowing up the NFA
    - US seemed to enjoy this privilege for a long time (Gourinchas and Rey)
    - Literature emphasized US foreign assets biased toward high return risky assets, liabilities largely low return Treasuries (Mendoza, Quadrini, Rios-Rull)
    - But if US enjoys excess returns, why is the NFA tanking?

Our Reassessment

- US privilege is over

- In last decade foreigners earned much higher returns on US assets than Americans earned on asset holdings abroad

- Part of traditional view of portfolios not right: foreigners own a lot of US equity (on top of treasuries)

- In fact, gross equity holdings large and roughly balanced

- Differential relative returns mostly about whose equity markets do better, not about equity vs. bond positions

- And US equity has surged over the past decade, while foreign stock markets have not

US Asset Prices

- Fast-growing macro-finance literature explores recent run-up in US asset values

  - Greenwald, Lettau, Ludvigson (2019); Farhi, Gourio (2018)

- Literature points to rising markups for US firms, declining real interest rates, declining risk premia

- We build a simple quantitative macro finance model that can incorporate these factors

  - extend it to an international setting
  - use it to interpret alternative drivers of surging US asset values and implications for the US NFA and for US welfare

Rest of This Talk

- An empirical accounting for US NFA dynamics

- A simple model to simulate alternative drivers of US asset valuations and their implications
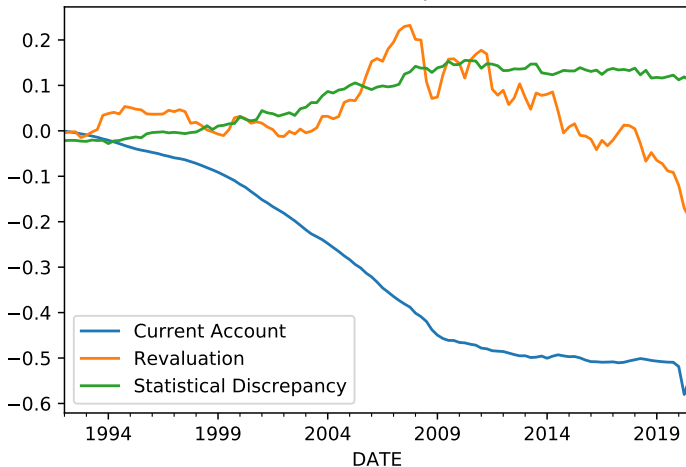
Accounting for NFA Dynamics

- Accounting identity:

$$NFA_{t+1} - NFA_t = \underbrace{CA_t}_{\text{net lending abroad}} + \underbrace{USFA_t \times g_{P*}^{t,t+1} - USFL_t \times g_P^{t,t+1}}_{\text{revaluation effects}}$$

- For valuation effects to matter need:

1. Large gross international asset positions
2. Big differences between $g_P^{t,t+1}$ and $g_{P*}^{t,t+1}$

- note: two ways to measure net lending abroad: current account surplus or capital account deficit (US purchases of foreign assets minus ROW purchases of US assets)

- measures don't perfectly match, difference is "statistical discrepancy"

US Current Account Decomposition

Contribution of Cumulated Components to US NFA/GDP
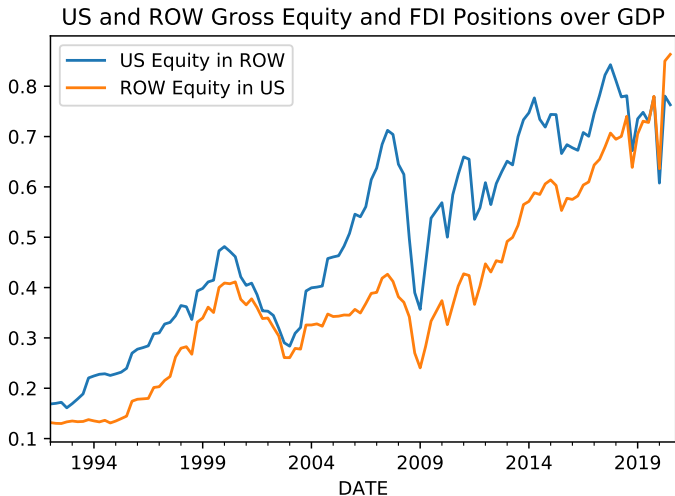
Everything Counts in Large Amounts

Gross Foreign Financial Claims over GDP

- US claims on ROW
- ROW claims on US
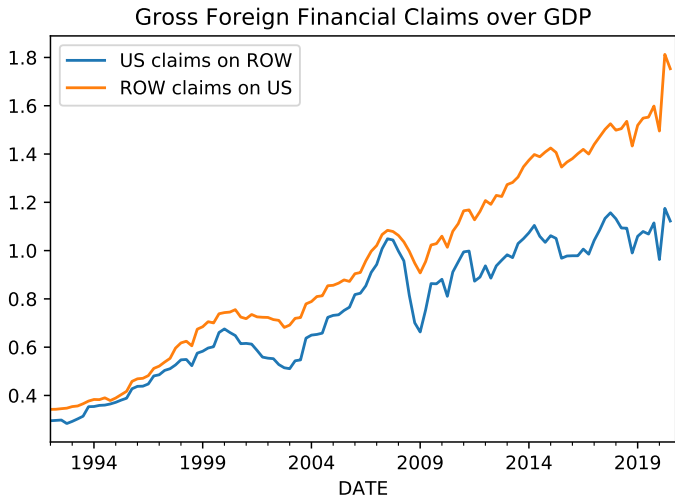
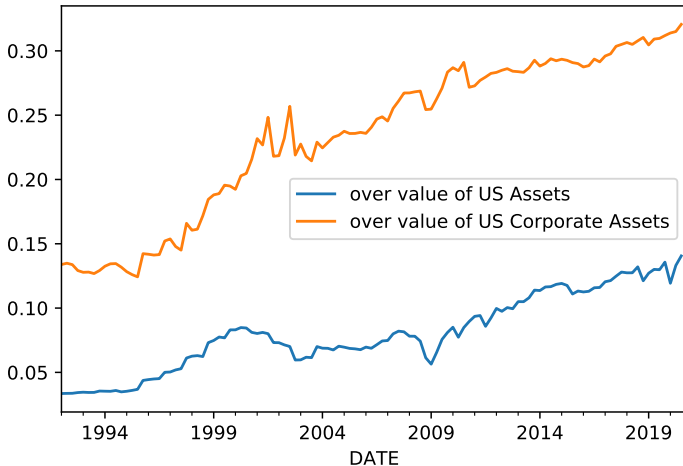# Equity and FDI: Just Can't Get Enough

US and ROW Gross Equity and FDI Positions over GDP

Debt

Foreign Asset Holdings / Value of US Assets

ROW Equity and FDI relative to value of US assets and Corporate Asset

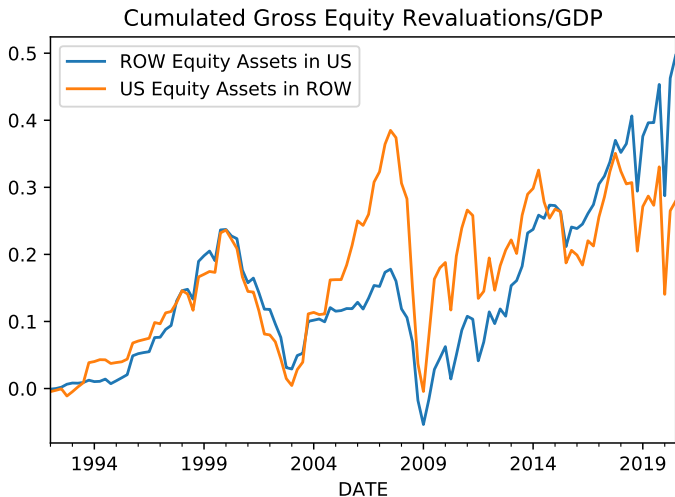# US Asset Holdings Abroad / Value of US Assets

Equity and FDI in ROW relative to value of US Assets and Corporate As
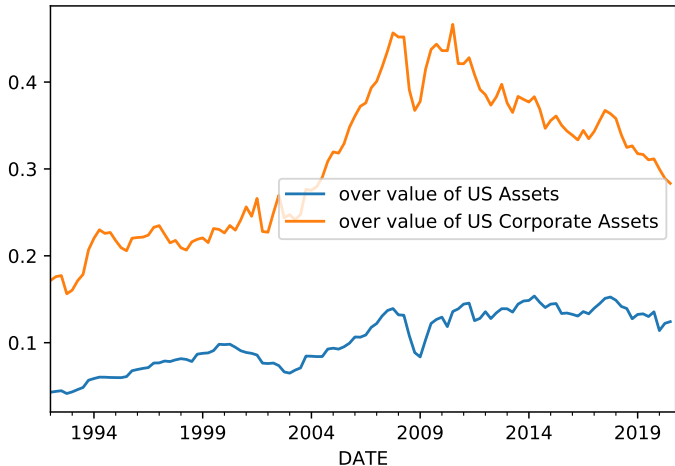
Differential Price Dynamics

Implied Revaluations

Cumulated Gross Equity Revaluations/GDP

Legend:
- ROW Equity Assets in US
- US Equity Assets in ROW

Revaluation Impact on NFA

Cumulated Net Revaluations/GDP
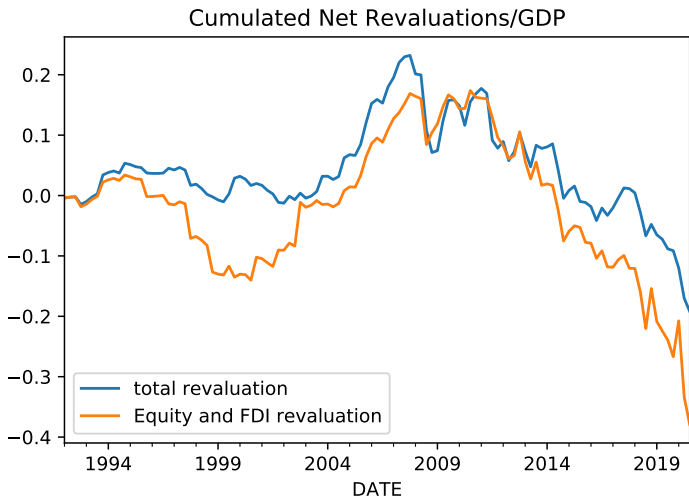
NFA Dynamics Summary

- From 2010 to 2020, US NFA position declined from 10% to 65% of GDP

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

- Dominant factor was revaluation effects

- In turn reflecting strong performance of US stock market, coupled with large international gross equity positions

Welfare Implications?

- What are the welfare implications of strong US asset price growth and resulting deterioration in NFA position?

- Need a story for the boom in US asset valuations

- Must be a US-specific shock, or a global shock that differentially boosts US asset values

- Turn to data and recent macro-finance literature for guidance

Asset Values

- Flow of Funds reports market value of non-financial assets in the US

- Also reports their replacement cost

- US Net Wealth is market value of non-financial assets plus Net Foreign Assets

- Foreign asset holdings essentially all in corporate sector

- We measure market value of non-financial assets in corporate sector as market value of equity plus value of debt minus value of financial assets ("enterprise value")

Value of US Non-Financial Assets

US Market and Replacement Value of Assets over GDP
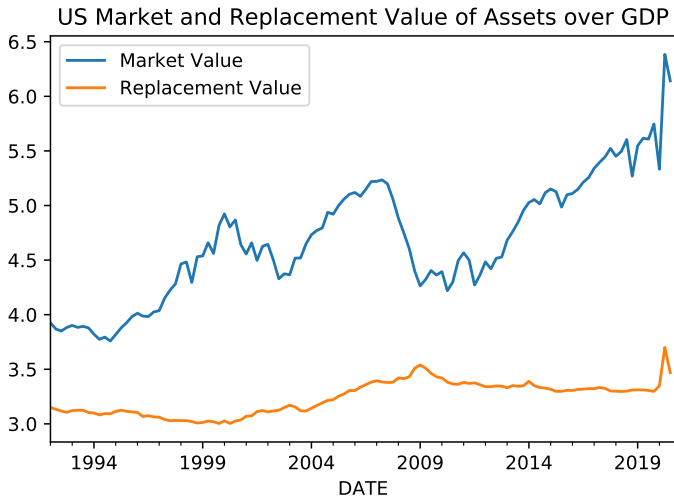
Value of US Corporate Non-Financial Assets

Corporate Market and Replacement Value of Assets over GDP

Corporate Sector Tobin's Q
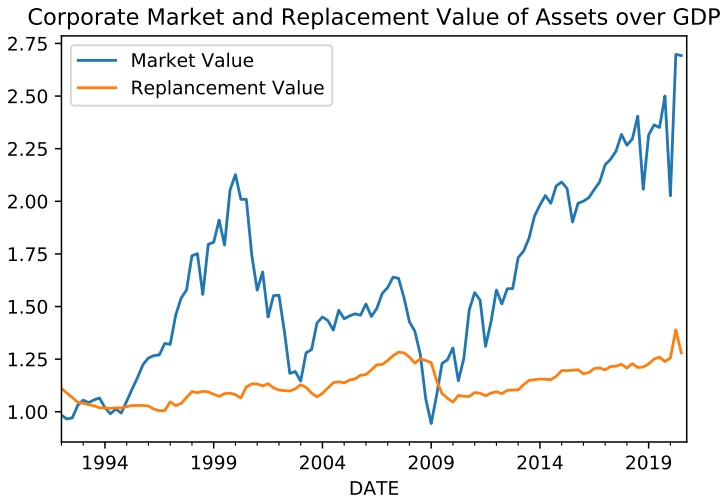
US Corporate Sector Tobins Q
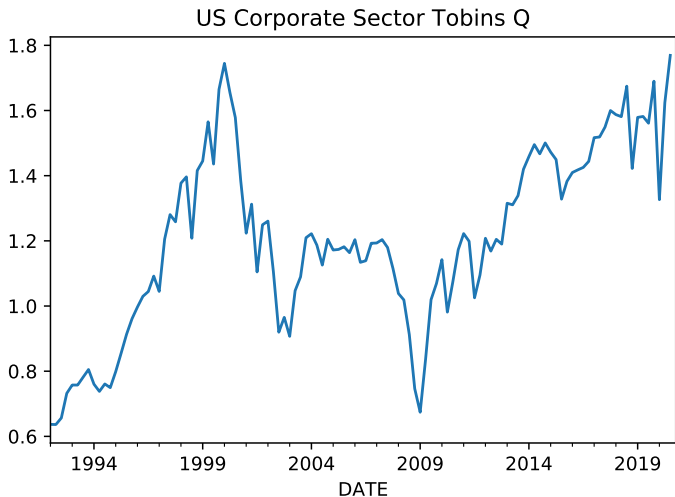
Summary

- Asset values increased by around 150% of GDP from 2010 to 2020

- Increase of corporate asset values similar to total increase

- Little change in K/Y ratio => rising asset values do not reflect increase in stock of tangible capital

Interpretations

1. Rising US markups and profitability

   - 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*"
   - Consistent with de Loecker, Eeckhout, Unger (2020) evidence on rising market power
   - Consistent with Karabarbounis, Neimann (2014, 2018) evidence on decline in labor share and rise in factorless income
   - Consistent with weak investment growth, notwithstanding low interest rates

2. Decline in risk premia for US stocks

3. Rising intangible capital for US firms

4. Diverging US vs ROW growth prospects

5. Declining world interest rates + US equity values more interest sensitive

Model

- Start with a simple tractable model
- Model US as small open economy, fixed world interest rate
- US firms compete monopolistically:
    - equity prices reflect both value of physical capital and claims to future monopoly profits
- Fixed domestic-versus-foreign equity portfolios
- Free international trade in a risk-free bond
- Consider unanticipated permanent shocks to markups and to equity discount factor

Firms

- Monopolistically-competitive intermediate goods sector

$$Y = \left(\int_0^1 Y_i^{\frac{\varepsilon-1}{\varepsilon}} \, di \right)^{\frac{\varepsilon}{\varepsilon-1}}$$

- Single final good Y used for consumption and investment
- Supplier of each variety rents capital and labor and solves

$$\max_{K,L} \left\{ p_i Y_i - RK - WL \right\}$$

$$
\begin{aligned}
Y_i &= K^\alpha (ZL)^{1-\alpha} \\
p_i &= P \left(\frac{Y}{Y_i} \right)^{\frac{1}{\varepsilon}}
\end{aligned}
$$

- Growth in labor productivity Z at rate g
- Other firms make investment decisions and rent out capital

$$\max_{\{K_{t+1}\}} E \sum_{t=0}^{\infty} \frac{1}{(1+r^*)^t} \left[R_t + (1-\delta)K_t - K_{t+1} \right]$$

Households

- Preferences

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

where

$$u(C,L) = \frac{\left(C - Z\frac{L^{1+\sigma}}{1+\sigma} \right)^{1-\gamma}}{1-\gamma}$$

- Hold fixed fractions λ and λ^* of domestic and foreign firms (symmetric across both types)

- Trade risk free bonds at fixed world interest rate r^*

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

where

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

Equilibrium

- Firm FOCs plus symmetry across varieties

$$\frac{\alpha}{\mu} \frac{K^\alpha (ZL)^{1-\alpha}}{K} = R$$

$$\frac{(1-\alpha)}{\mu} \frac{K^\alpha (ZL)^{1-\alpha}}{L} = W$$

where $\mu = \frac{\varepsilon}{\varepsilon-1}$ is the markup

$$RK + WL = \alpha \frac{Y}{\mu} + (1-\alpha)\frac{Y}{\mu} = \frac{Y}{\mu}$$

- Rest of output is profits (factorless income)

$$\Pi = \frac{\mu - 1}{\mu} Y$$

- FOC for labor supply

$$W = ZL^\sigma$$

$$L = \left(\frac{W}{Z}\right)^{\frac{1}{\sigma}}$$

Equilibrium

- Labor and capital market clearing

$$
\begin{aligned}
W &= ZL^\sigma \\
R &= r^* + \delta
\end{aligned}
$$

- Implies

$$
\begin{aligned}
\frac{K}{Z} &= \left(\frac{1}{\mu}\right)^{\frac{1+\sigma}{\sigma(1-\alpha)}} (1-\alpha)^{\frac{1}{\sigma}} \left(\frac{r^* + \delta}{\alpha}\right)^{-\frac{\sigma+\alpha}{\sigma(1-\alpha)}} \\
L &= \left(\frac{1}{\mu}\right)^{\frac{1}{\sigma(1-\alpha)}} (1-\alpha)^{\frac{1}{\sigma}} \left(\frac{r^* + \delta}{\alpha}\right)^{\frac{\alpha}{\sigma(\alpha-1)}} \\
\frac{Y}{Z} &= (1-\alpha)^{\frac{1}{\sigma}} \left(\frac{1}{\mu}\right)^{\frac{1+\sigma\alpha}{\sigma(1-\alpha)}} \left(\frac{r^* + \delta}{\alpha}\right)^{-\frac{(1+\sigma)\alpha}{\sigma(1-\alpha)}}
\end{aligned}
$$

$$
\frac{K}{Y} = \frac{\alpha}{\mu}\frac{1}{r^* + \delta}
$$

- Disutility term from labor supply, relative to output, is

$$
\frac{-Z\frac{L^{1+\sigma}}{1+\sigma}}{Y} = -\frac{1}{1+\sigma}\frac{1}{\mu}(1-\alpha)
$$

Asset Values

- Ex-dividend price of the investment firm is K_{t+1}

- Ex dividend price of monopolistic firms is

$$V_t = \sum_{j=1}^{\infty} \frac{\Pi_{t+j}}{(1+r^*)^j}$$

- Equity price to output (Buffett ratio) on BGP is

$$\frac{P}{Y} = \frac{\alpha}{\mu} \frac{1+g}{r^* + \delta} + \frac{1+g}{r^* - g} \frac{\mu - 1}{\mu}$$

- Dividend price ratio is

$$\frac{D}{P} = \frac{r^* - g}{1+g}$$

Calibration

- Set

$$r^* = 0.04$$
$$g = 0.02$$

- Set μ, α and δ to replicate $\frac{WL}{Y}$, and $\frac{P}{Y}$ and $\frac{K}{Y}$ values for 2010

$$\frac{WL}{Y} = \frac{(1 - \alpha)}{\mu} = 0.65$$
$$\frac{P}{Y} = \frac{\alpha}{\mu} \frac{1 + g}{r^* + \delta} + \frac{1 + g}{r^* - g} \frac{\mu - 1}{\mu} = 4$$
$$\frac{K}{Y} = \frac{\alpha}{\mu} \frac{1}{r^* + \delta} = 3$$

- Implies $\mu = 1.02$ $\alpha = 0.337$ and $\delta = 0.07$
- Consider shock from μ to μ' that raises $\frac{P}{Y}$ to 6 (2020 value)
- Requires $\mu' = 1.0625$
- Assume capital can be instantly reallocated following the shock $\Rightarrow$ transition is immediate

- Assume pre-shock world is symmetric with zero NFA:

$$B_0 = 0, (1 - \lambda)P_0 = \lambda^* P_0^*$$

- Assume r^* s.t. household wants consumption growth at rate g

$$1 = \frac{(1 + r^*)}{(1 + \rho)}(1 + g)^{-\gamma}$$

Balance of Payments Accounting

- Domestic resource constraint

$$C_t + K_{t+1} + NX_t = Y_t + (1 - \delta)K_t$$

- Combining with budget constraint

$$\underbrace{B_{t+1} - B_t}_{\text{net foreign lending}} = NX_t + \underbrace{r^* B_t - (1 - \lambda)D_t + \lambda^* D^*}_{\text{net factor income from abroad}} = CA_t$$

- Define the net foreign asset position as

$$NFA_t = B_{t+1} + \lambda^* P_t^* - (1 - \lambda)P_t$$

- So the change in the net foreign asset position is

$$NFA_t - NFA_{t-1} = CA_t + \underbrace{\lambda^* \left(P_t^* - P_{t-1}^* \right) - (1 - \lambda)\left(P_t - P_{t-1} \right)}_{\text{valuation effects}}$$

Increase in Markups

- Domestic output declines: firms reduce demand for capital and labor

- Output decline is given by

$$Y(\mu') = \left(\frac{\mu}{\mu'}\right)^{\frac{1+\sigma\alpha}{\sigma(1-\alpha)}} \times Y(\mu) = 0.95 \times Y(\mu)$$

  given $\sigma = 2$

- Wages and labor's share of output decline

- Domestic profits increase: fraction λ flows to domestic consumers, $(1-\lambda)$ to foreigners

- Domestic capital reallocates abroad to keep earning r^* (households swap capital for bonds)

- Domestic consumption and hours worked decline

Welfare Effects of Markup Shock

- What are the welfare effects, how do they depend on λ?

- Let ω be permanent percent decline in argument of utility given μ that leaves domestic households indifferent between μ and μ'

$$\omega = \frac{\frac{(1-\alpha)}{\mu} + \lambda\frac{\mu-1}{\mu} - \frac{1}{1+\sigma}\frac{1}{\mu}(1-\alpha) - \left(\frac{(1-\alpha)}{\mu'} + \lambda\frac{\mu'-1}{\mu'} - \frac{1}{1+\sigma}\frac{1}{\mu'}(1-\alpha)\right)\left(\frac{\mu}{\mu'}\right)^{\frac{1+}{\sigma(1}}}{1 - (\delta+g)\frac{\alpha}{\mu}\frac{1}{r+\delta} - \frac{1}{1+\sigma}\frac{1}{\mu}(1-\alpha)}$$

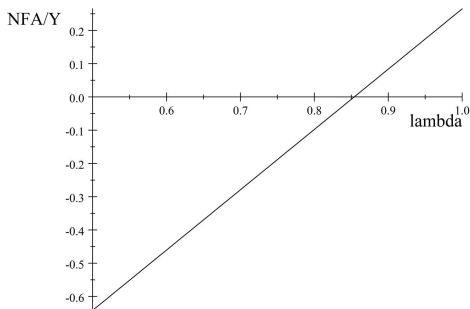- Denominator is flow utility in baseline steady state

- Terms in the numerator:

  1. decline in labor earnings: $\frac{(1-\alpha)}{\mu}Y \to \frac{(1-\alpha)}{\mu'}\left(\frac{\mu}{\mu'}\right)^{\frac{1+\sigma\alpha}{\sigma(1-\alpha)}}Y$

  2. rise in domestic profit income: $\lambda\frac{\mu-1}{\mu}Y \to \lambda\frac{\mu'-1}{\mu'}\left(\frac{\mu}{\mu'}\right)^{\frac{1+\sigma\alpha}{\sigma(1-\alpha)}}Y$

  3. rise in value of leisure: $-\frac{1}{1+\sigma}\frac{1}{\mu}(1-\alpha)Y \to$

     $-\frac{1}{1+\sigma}\frac{1}{\mu'}(1-\alpha)\left(\frac{\mu}{\mu'}\right)^{\frac{1+\sigma\alpha}{\sigma(1-\alpha)}}Y$

  4. no change in profit income from foreign firms

  5. no impact from ownership of investment-producing firms

Quantification
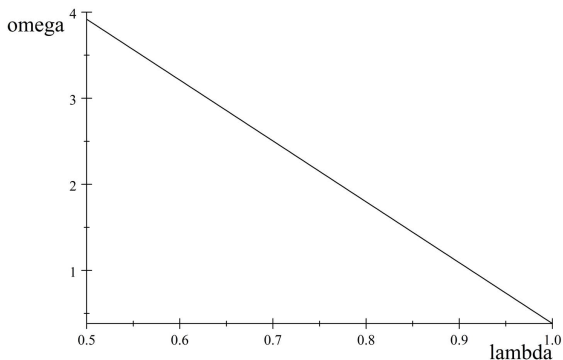
- Data suggest $\lambda \approx 0.7$
- When $\lambda = 1$ cost of rise in markups is 0.38% of consumption
- When $\lambda = 0.7$ cost of same rise in markups is 2.50% of consumption!

NFA

$$NFA = (1 - \lambda)\underbrace{\frac{1}{r - g}\left(\frac{\mu - 1}{\mu} - \frac{\eta - 1}{\eta}\left(\frac{\mu}{\eta}\right)^{\frac{1+\sigma\alpha}{\sigma(1-\alpha)}}\right)Y}_{\Delta V} + \underbrace{\frac{\alpha}{r + \delta}\left(\frac{1}{\mu} - \frac{1}{\eta}\left(\frac{\mu}{\eta}\right)^{\frac{1+\sigma\alpha}{\sigma(1-\alpha)}}\right)}_{\Delta K = \Delta B}$$

- When $\lambda = 0.7$, model predicts decline in NFA position of 28.0% of GDP
  - Comprises a 26.4% of GDP increase in the net bond position ...
  - ... and a 54.3% of GDP decline in the net equity position