A Portfolio Approach to Global Imbalances

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Discussion: Adrien Verdelhan, March 2021

This Paper

- A great topic: linking net foreign assets to savings glut, central banks, and flight to safety

- A wealth of data:
    - 43 countries, 2002 — 2016,
    - 147.9 trillion dollars of assets under management in 2016

- Two provocative results:
    1. the identification of large changes in demand for U.S. assets
    2. if the U.S. debt were to increase by $1.5 trillion, the interest rate would increase by 1%
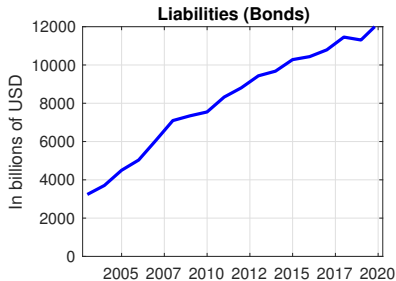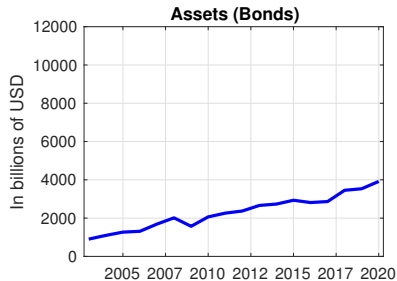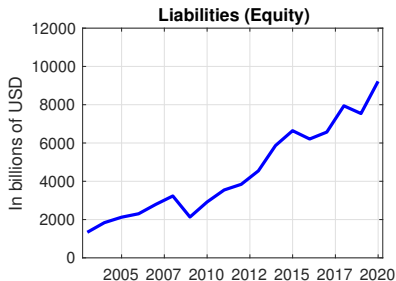
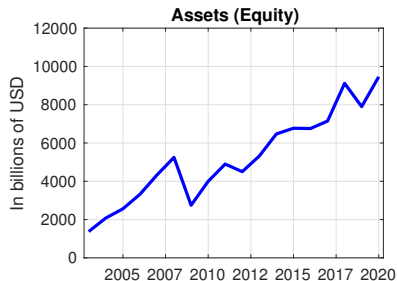# Discussion

1. Flows vs Valuation Changes

2. Identification

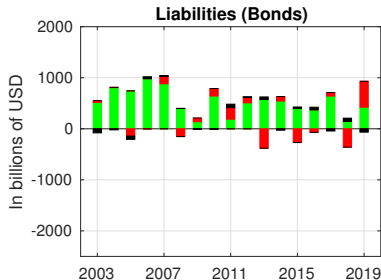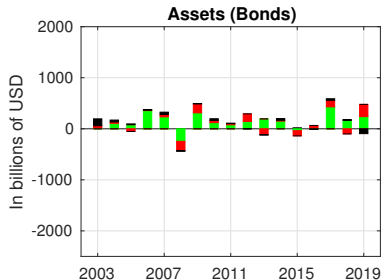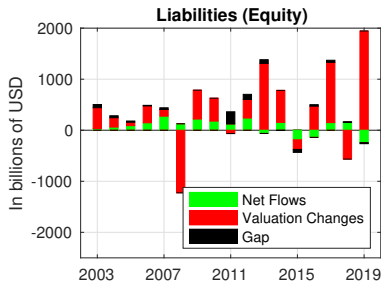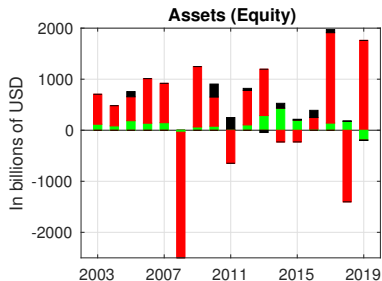3. Simulations

Great Topic!
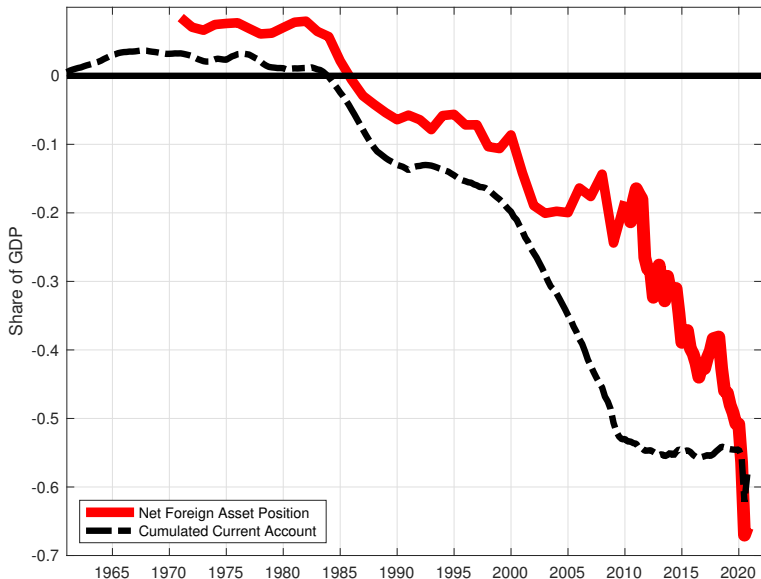
Source: BEA, 1960Q1–2020Q3.

U.S. Foreign Assets and Liabilities (Portfolio Investments)

Source: BEA, 2002–2019.

Changes in U.S. Foreign Assets and Liabilities (Portfolio Investments)

Source: BEA, 2003–2019.

Endogeneity

- Prices (p_t) and quantities (q_t) are endogenous:

$$
\begin{aligned}
q_t &= \alpha p_t + \eta_t, \\
p_t &= \beta q_t + \varepsilon_t
\end{aligned}
$$

- Even if $\sigma_{\varepsilon,\eta} = 0$, one can only estimate the covariance matrix:

$$
\hat{\Omega} = \left[\begin{array}{cc} \sigma_p^2 & \sigma_{pq} \\ & \sigma_q^2 \end{array} \right] = \frac{1}{(1-\alpha\beta)^2} \left[\begin{array}{cc} \beta^2\sigma_\eta^2 + \sigma_\varepsilon^2 & \beta\sigma_\eta^2 + \alpha\sigma_\varepsilon^2 \\ & \sigma_\eta^2 + \alpha^2\sigma_\varepsilon^2 \end{array} \right].
$$

- Classic challenge:
    - three moments (σ_p^2, σ_q^2, and σ_{pq}),
    - but four unknowns (α, β, σ_ε^2, σ_η^2).

Instrumental Variable
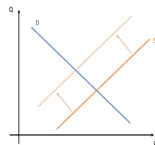
- Demand and supply depend on $\mathbf{x_t'}$:

$$[\text{Demand}] \ q_t = \alpha p_t + \mathbf{x_t'}\lambda + \eta_t,$$
$$[\text{Supply}] \ q_t = \frac{1}{\beta}p_t + \mathbf{x_t'}\zeta - \frac{1}{\beta}\varepsilon_t$$

- A variable $x_t^{(k)}$ that shifts the supply curve but is uncorrelated with η_t may be used as an instrument for price to estimate the demand curve.
    - Exclusion restriction (in demand): $\lambda^{(k)} = 0$
    - Relevance condition (in supply): $\zeta^{(k)} \neq 0$

- Paper: *Exogenous characteristics (GDP, bilateral distance, investor fixed effects, own country dummy) => exogenous variation in portfolio weights + market clearing => instruments for exchange rates and prices*

Instrumental Variable, cont.

- ► Relevance condition (first stage)
    - ► Does the instrument explain some variation in quantities (portfolio weights)?

- ► Exclusion restriction: Why doesn't the instrument change the demand curve?

- ► In the paper, the U.S holdings of foreign equity depend on:
    - ► an equity fixed effect
    - ► expected returns, predicted from book-to-market ratios and exchange rates
    - ► asset and country characteristics (market value, book value, 3-month and 10-year interest rates, inflation, GDP, GDP per capita, sovereign default risk, trade centrality, distance, imports, exports)
    - ► a U.S. latent demand for equity and a latent demand for equity in each foreign country

Simulation

- ▶ Two experiments:
  - ▶ Experiment 1: Assume that all agents maintain their 2002 holdings throughout the sample, then relax these constraints sequentially (first investors' savings and assets' supply, then central banks, and finally demand shifts), solving for equilibrium prices and portfolio allocations at each step
  - ▶ Experiment 2: Increase the amount of debt by \$1.5 trillion $\Rightarrow$ the equilibrium yield increases by 1% $\Rightarrow$ (comparison to sovereign risk models a la Eaton-Gersovitz?)

- ▶ Lucas' critique
  - ▶ Are we assuming that the impact of each characteristic (on the portfolio choices) does not change across regimes?
    - ▶ The prices and quantities are simulated under different assumptions imposing market clearing, but are the demand coefficients re-estimated?
  - ▶ Example: low vs high inflation

Conclusion

- Very interesting topic and paper!

- Suggestions: tell us more about

    - Flows vs valuation changes: how does the estimation match the data? what does it imply country by country?

    - Identification: how powerful are the instruments?

    - Simulation: how does it address the Lucas' critique?