Exorbitant Privilège and Exorbitant Duty

Pierre-Olivier Gourinchas
UC Berkeley and IMF

Hélène Rey
London Business School

Michele Andreolli
Boston College

CRETE 2025

The views expressed in this paper are those of the authors and do not represent the views of the IMF.

Exorbitant Privilège and Exorbitant Duty

5 important facts on the US & the International Financial System :

- A World Banker's Balance Sheet
- "Exorbitant Privilège" in normal times
- "Exorbitant Duty" in crisis times
- Real appreciation of Dollar assets during global crises
- Dollar safe real rate goes down as size of the US economy goes down in relative terms: "Vanishing Hegemon".

Literature [First draft 2010...]

- Met John G (collateral and the Merchant of Venice) when I presented exorbitant privilege /duty in Crete 2011.
- International Monetary System: Kindleberger, Kenen, Krugman (1984), Rey (2001), Lane and Milesi Ferretti (2007), Gourinchas and Rey (2007a,b), Caballero, Farhi and Gourinchas (2008), Gourinchas, Farhi and Rey (2011) Obstfeld (2011), Eichengreen (2011), Shin (2013), He, Krishnamurthy and Milbradt (2016), Caballero and Simsek (2017), Farhi and Maggiori (2018), Gourinchas, Rey and Sauzet (2019), Gopinath and Stein (2021), Mukhin (2022), Fostel, Geanakoplos and Phelan (2025).
- Models with comparative advantage in asset trade Helpman Razin (2014); asymmetric size of financial markets: Martin and Rey (2006) (endogenous creation of Arrow Debreu assets).
- Building on this paper (and now almost all published): Maggiori (2017), Kekre and Lenel (2024), Atkeson, Heathcote and Perri (2025), Sauzet (2024) Heyerdahl-Larsen, Pavlova and Penasse (2025)

Newcomers in the Literature

- Global Hegemony and Exorbitant Privilege (2025), Caroline Pflueger and **Pierre Yared [member of the US Council of Economic Advisors]**

- A User's Guide to Restructure the Global Trading System (2024), **Stephen Miran [Chair of the US Council of Economic Advisors]**

Exorbitant Privilège

- Term attributed to Valery Giscard d'Estaing, French finance minister in 1965.

- Jacques Rueff (economic advisor to de Gaulle):

  "The country with a key currency is in the deceptively euphoric position of never having to pay off its international debts. [...] This situation is the result of a collective error of historic proportions."

- Stephen Miran (economic advisor to Trump):

  "Synthesizing these properties of reserve assets, if there is persistent, price-inelastic demand for reserve assets but only modestly cheaper borrowing, then America's status as reserve currency confers the burden of an overvalued currency eroding the competitiveness of our export sector, balanced against the geopolitical advantages of achieving core national security aims at minimal cost via financial extraterritoriality."

Exorbitant Privilège and Exorbitant Duty

- Modern meaning: Gourinchas and Rey (2007a,b) [From world banker to world venture capitalist: the US and the exorbitant privilege & International Financial Adjustment]
  - Excess return of US external assets over US external liabilities.
  - Important for long run sustainability (relaxes US intertemporal constraint). Stable external position despite trade deficits.
  - Due to asymmetric external balance sheet: World Banker;
- 'Exorbitant Privilège'

Exorbitant Duty

- Large US valuation losses in crisis times
- Transfers wealth from the US to the rest of the world.
- Precisely at times when the global marginal utility of consumption is high.
- 'Exorbitant Duty'

A Theoretical Framework

- Model to make sense of these facts;
  - 'Exorbitant Privilege' and 'Exorbitant Duty' are two sides of the same coin;
  - Leads to an alternative interpretation of the role of the hegemon in the International Financial System: World insurer.
  - We can use the model to study a "Vanishing Hegemon": implications for real rate and real exchange rate volatility.

External Balance Sheet

- "From World Banker to World Venture Capitalist", 1952Q1 to 2021Q4
  - Use historical data on positions (annual), flows (quarterly) and asset and asset price series for valuations.
  - More detailed decomposition on liability side (corporate and government debt estimated separately)
  - Use detailed wartime Treasury Surveys of cross border holdings (1941, 1943) to cross check our initial positions. Surveys of strategic importance (reparations, and identification of foreign agents)

'investigations to uncover enemy agents and enemy assets, especially after our entry into the war, were greatly facilitated by the [1941 Treasury Census of foreign-owned assets in the US].' 'The [1943 Treasury Census of American-owned assets in foreign countries] had its principal use in the war settlements, although it provided much greatly needed information during the latter part of the military phases of the war.'

Introduction to the 1941 and 1943 Surveys.

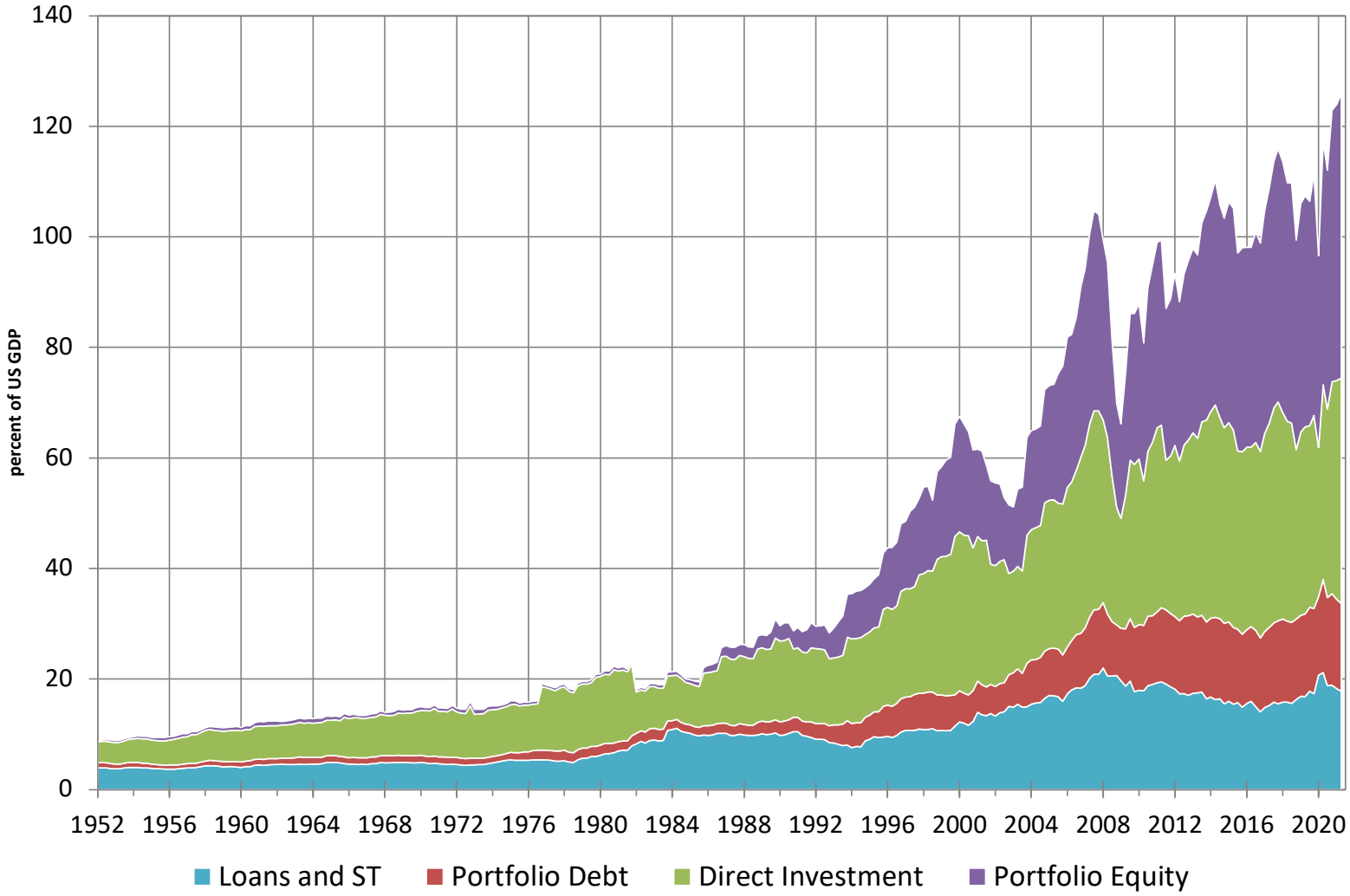
Methodology

$$P^i_{t+1} = P^i_t + F^i_{t+1} + V^i_{t+1} + OC^i_{t+1}$$

where

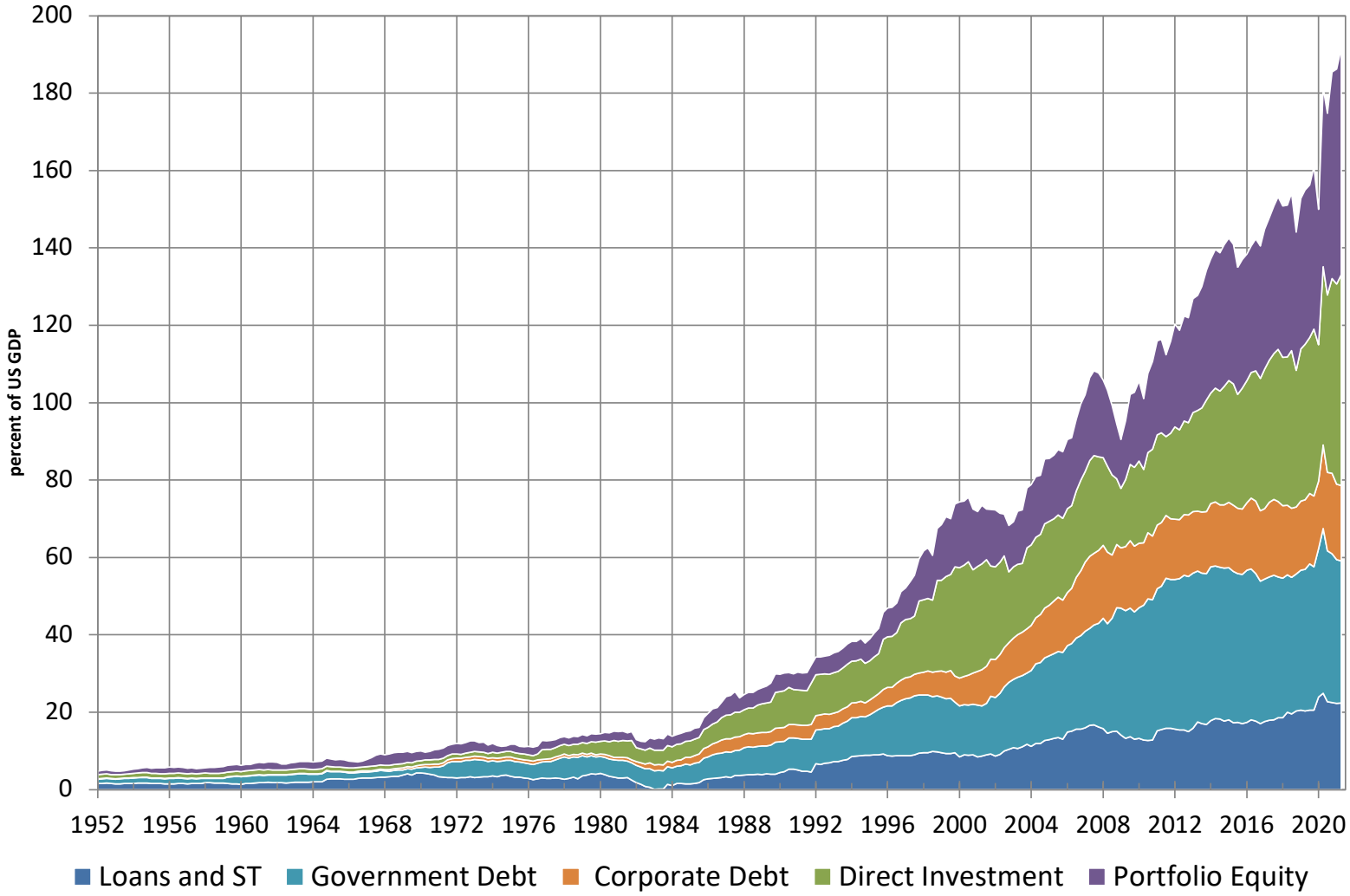
- P^i_t: Positions for assets i at the end of period t (BEA, FoF, surveys);
- F^i_t: gross financial flows during period t (Balance of Payments);
- V^i_t: Valuation gains or losses attributed to currency and local asset price movements;
- OC^i_t: Other changes reported by the BEA (in Q4); Reconciliation item.

US Gross Assets Position (percent of output)



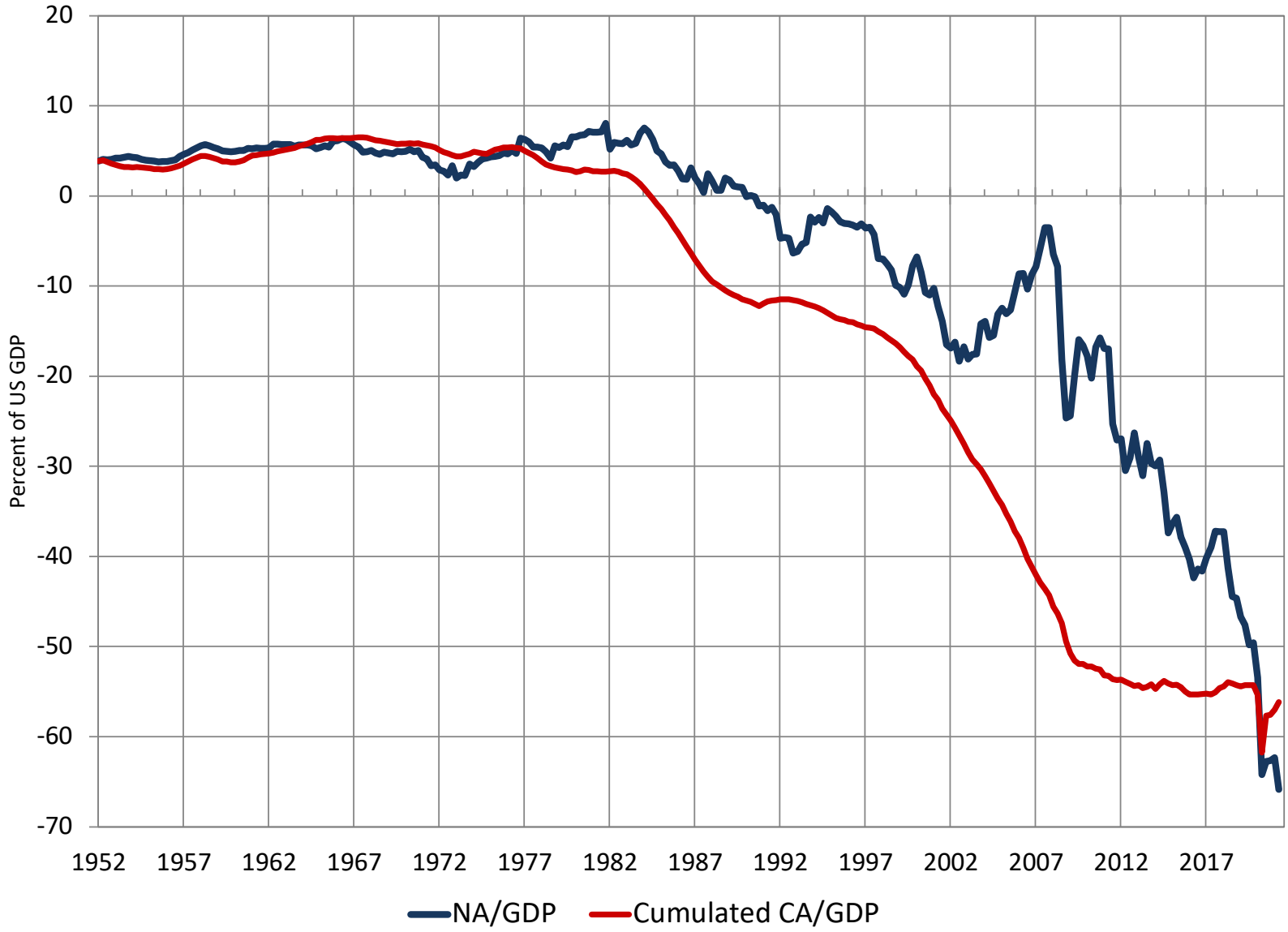
Source: BEA, SCB, 1941-43 Treasury Surveys, and authors' calculations

US Gross Liabilities Position (percent of output)



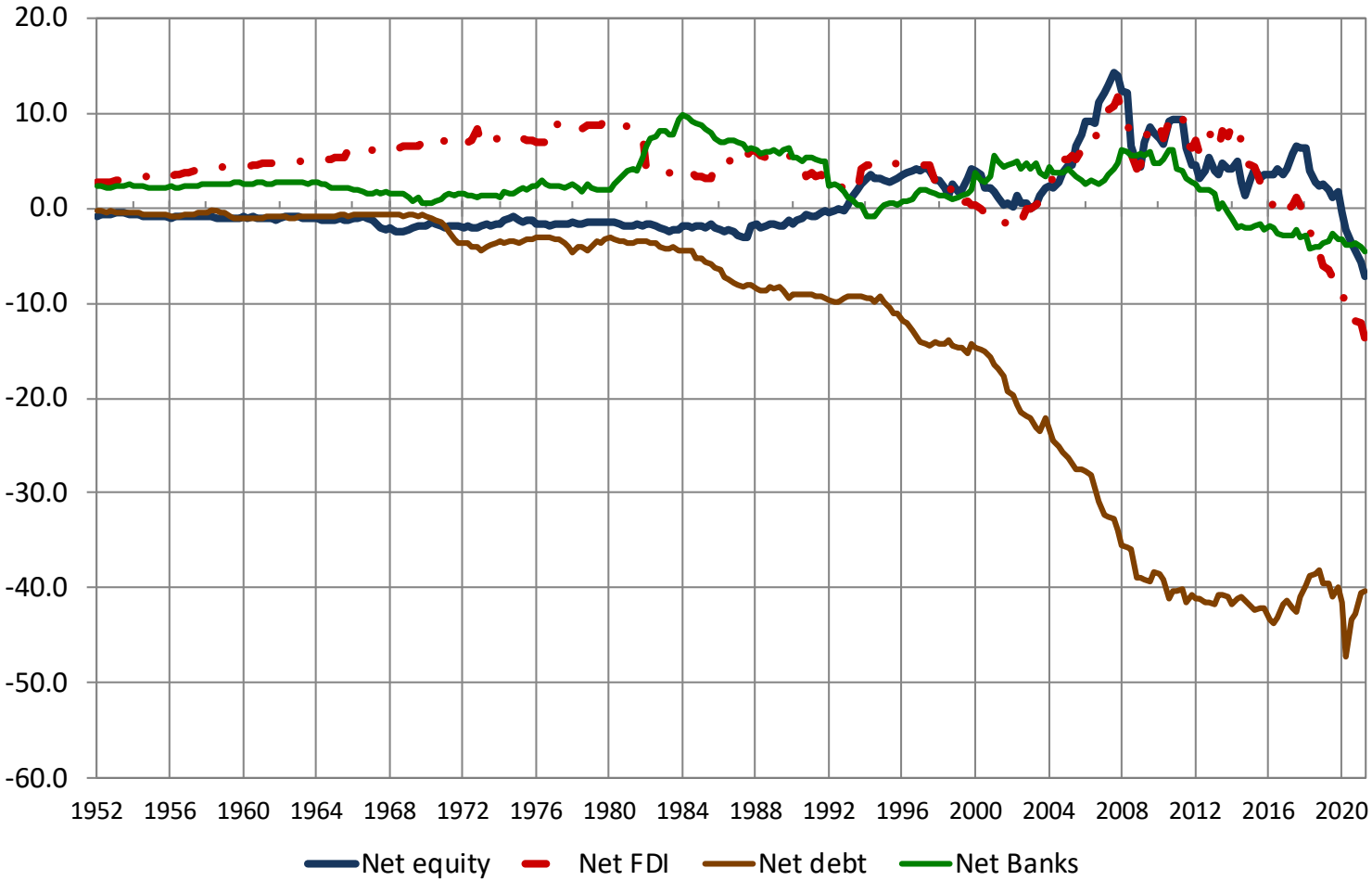
Source: BEA, SCB, 1941-43 Treasury Surveys, and authors' calculations

US Net Foreign Asset Position (percent of output)



Source: BEA, SCB, 1941-43 Treasury Surveys, and authors' calculations

US Net Positions Across Assets (percent of output)



Source: BEA, SCB, 1941-43 Treasury Surveys, and authors' calculations

Leveraged Balance Sheet

- Asymmetric external balance Sheet

  a. in terms of asset classes (debt and bank loans on liability side are large; FDI and equity on asset side are large)

  b. in terms of currencies (liabilities in dollars, assets in foreign currencies)

- ...like a bank, US external position is leveraged.

US Gross External Returns

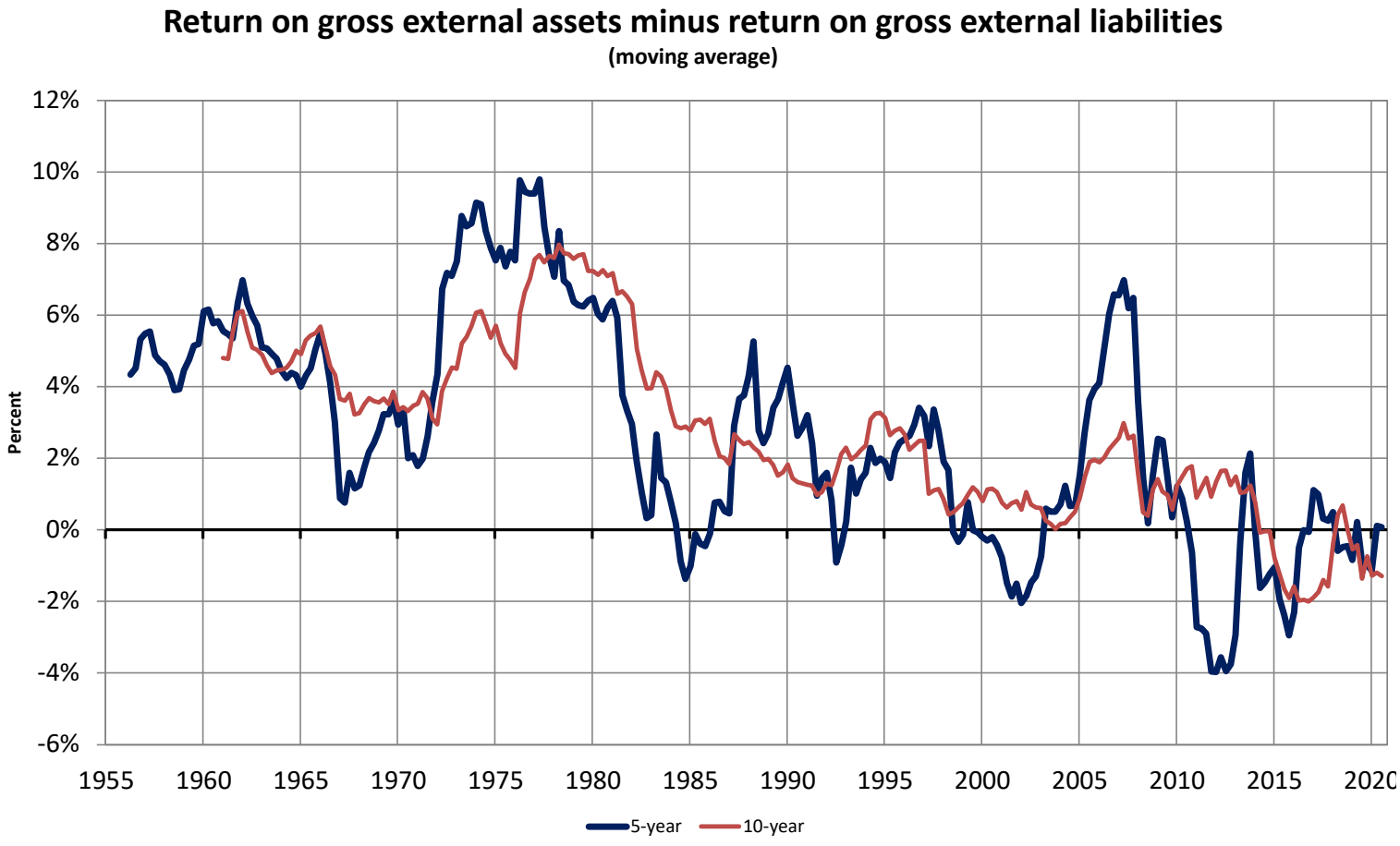
average returns	1952:1-2015:4	1952:1-1972:4	1973:1-2015:4
		(a) : Valuations	
$r^a - r^l$	2.69%	1.30%	3.47%
r^a	5.84%	5.04%	6.30%
r^l	3.16%	3.74%	2.83%
		(b) : Financial Flows	
$r^a - r^l$	1.49%	1.25%	1.62%
r^a	4.91%	4.71%	5.02%
r^l	3.42%	3.46%	3.40%
		(c) : Mixed	
$r^a - r^l$	2.44%	1.28%	3.11%
r^a	5.76%	4.96%	6.21%
r^l	3.31%	3.68%	3.11%

Table: Panel (a): "Other changes" allocated to valuations; Panel (b): to financial flows; Panel (c): to valuations, except for debt assets and liabilities. r^a refers to gross assets, r^l to gross liabilities. Annualized quarterly real returns.

'Exorbitant Privilège'

- Excess returns between 1.5% and 2.7% p.a.
- After 1973, flexible exchange rate system. Higher return and higher volatility.
- Important to look at long periods.

Secular Decline of the Exorbitant Privilège?

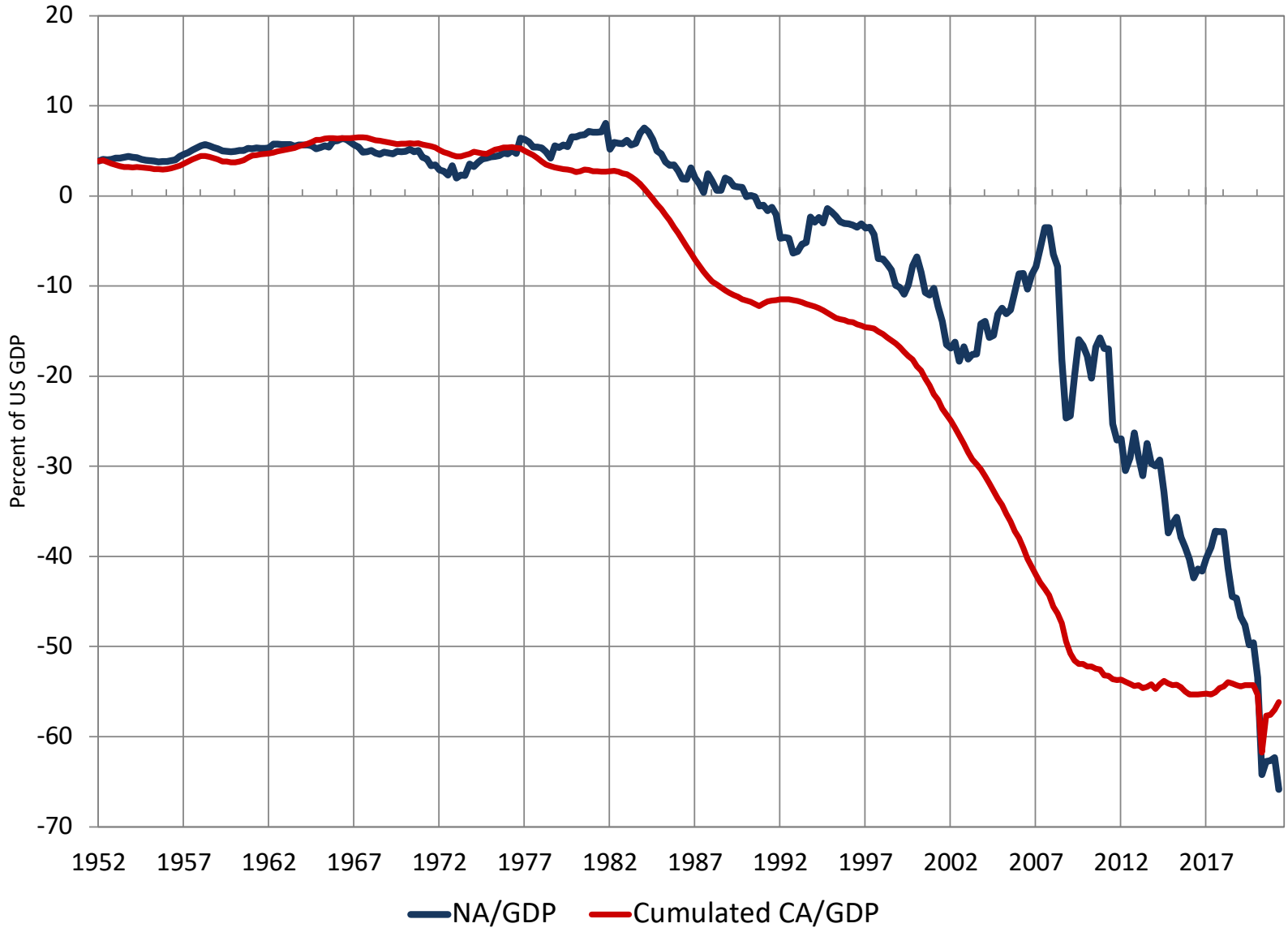


Source: BEA, SCB, 1941-43 Treasury Surveys, and authors' calculations

'Exorbitant Duty'

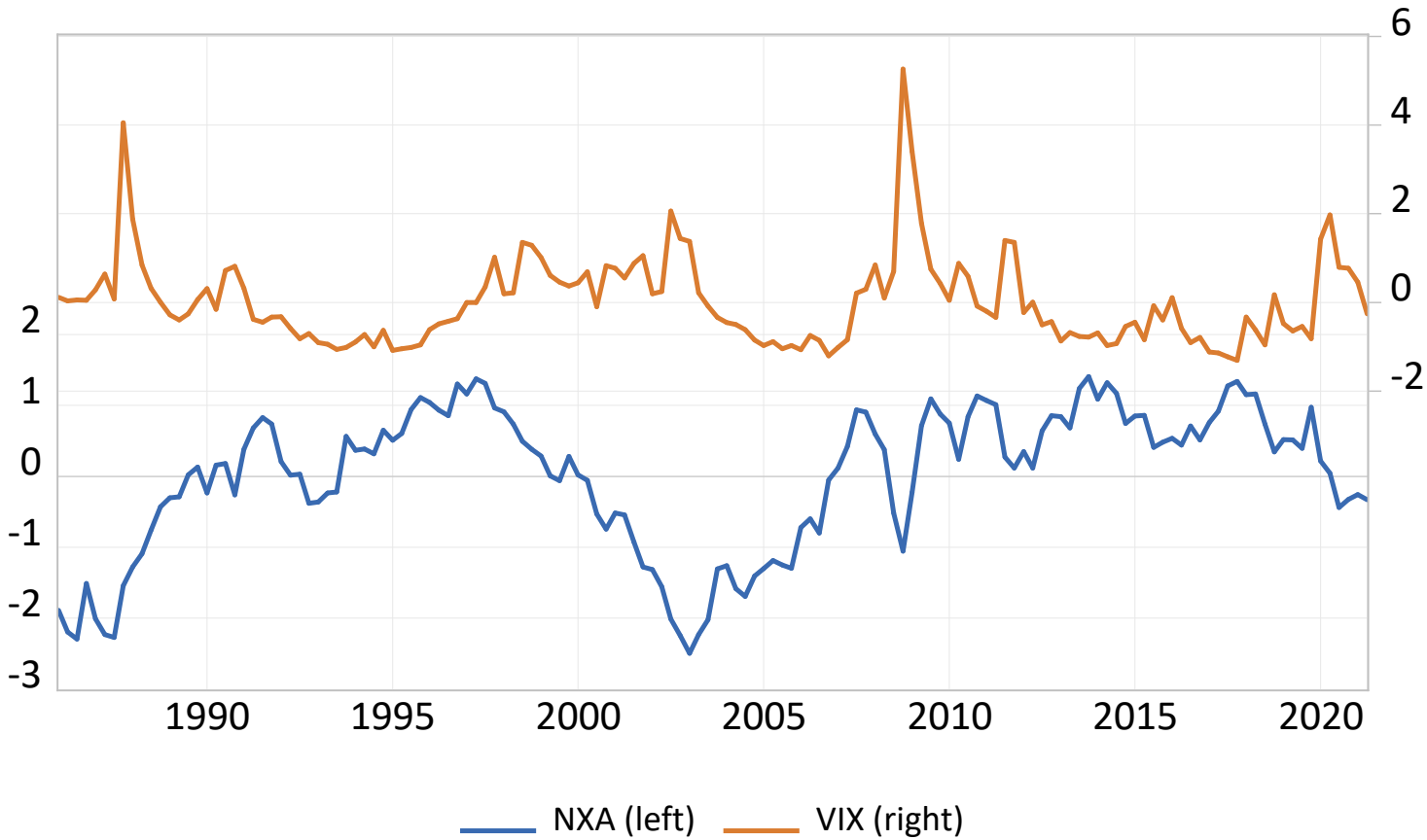
- During the Great Financial Crisis , US net foreign asset position deteriorated massively
  - Between 2007:4 and 2009:1, *NA* drops from USD -1.6tr to USD -4.29tr, a decline of USD 2.7tr
  - Over same period, cumulated current account represents -809bn,
  - Valuation loss of USD 1.9tr, or about 14% of US GDP,

US Net Foreign Asset Position (percent of output)



Source: BEA, SCB, 1941-43 Treasury Surveys, and authors' calculations

Valuations and the VIX



Source: VIX in orange and valuations in blue. CBE and authors' calculations

‘Exorbitant Duty’

- Worsening of US net foreign asset position occurs largely through a valuation loss: risky assets collapse, while US government debt increases in value.
- This valuation loss transfers wealth from the US to the rest of the world.
- US provides a transfer at times when the marginal utility of consumption is high.
- We interpret the ‘exorbitant duty’ as an insurance payment and the ‘exorbitant privilege’ as the corresponding insurance premium.

A Simple Model of Insurance Provision

- 2 countries, Home (US) and Foreign ($*$), equal size $1/2$.
- Endowment economy: y_t, y_t^*. Global output $\bar{y}_t$ iid.
- Representative household with CRRA preferences: $E_t \sum_{s=t}^{\infty} \beta^t c_t^{1-\sigma} / (1-\sigma)$,
- US has more tolerance for risk: $\sigma < \sigma^*$ (interpreted broadly as access to technology to reduce risk)
- Markets are complete.

A Simple Model

- Ex-ante symmetric equilibrium:

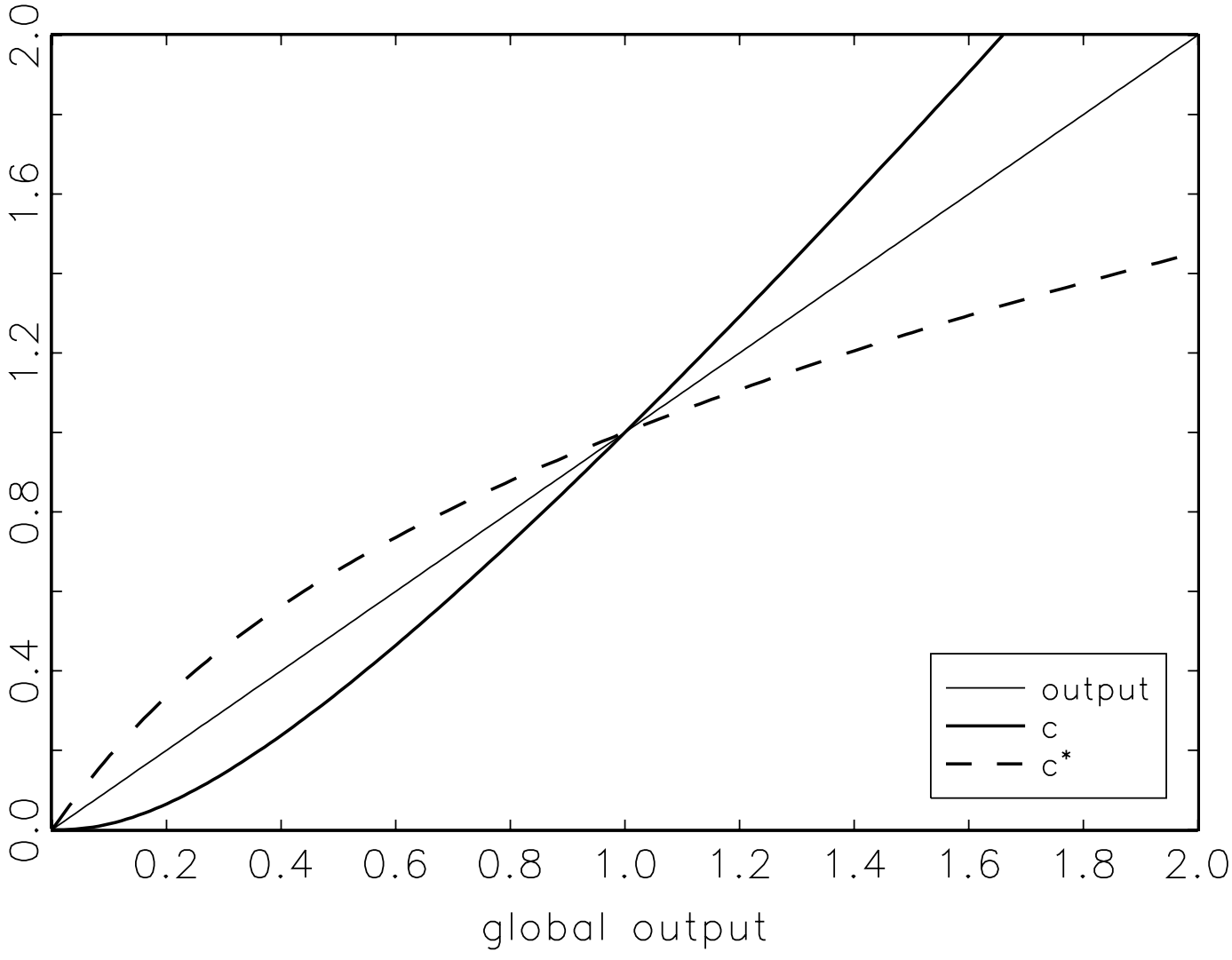
$$\frac{1}{2}\frac{c}{E\bar{y}} + \frac{1}{2}\left(\frac{c}{E\bar{y}}\right)^{\sigma/\sigma^*} = \frac{\bar{y}}{E\bar{y}}.$$

  - US 'insures' foreign against bad times.
- US implements allocation with equity holdings of $\sigma^*/(\sigma+\sigma^*) > 1/2$: leveraged external portfolio
- Autarky risk-free interest rate (w/output log-linearly distributed, variance σ_ϵ^2)

$$E \ln R_t^{aut} = -\ln \beta - \frac{\sigma^2}{2}\sigma_\epsilon^2.$$

  - lower autarky interest rate abroad since $\sigma^* > \sigma$
- US runs trade deficit

Risk Sharing with Heterogenous Risk Aversion



A Model of Global Disasters and Insurance

- Simple model is too stylized
  - single good, so no real exchange rate nor difference in risk free returns
  - symmetric size
  - no episodes of global stress
- Richer model includes:
  - multiple goods (traded and non-traded)
  - differences in size (Hassan (2009))
  - global disaster risk (Barro (2006) and Rietz (1988)) (normal, fragile and catastrophic states)
  - fiscal capacity
  - state dependant degree of risk aversion: global financial cycle

A Model of Global Disasters and Insurance

- 2 countries, Home (US) and Foreign ($*$), home size α.
- Endowment economy:
  - y_t^T, y_t^{*T} traded,
  - y_t^N, y_t^{*N} non traded.
  - Global output of traded good $\bar{y}_t^T = \alpha y^T + (1-\alpha) y^{*T}$.
- Representative household with CRRA preferences and $\sigma \leq \sigma^*$:

$$E_t \sum_{s=t}^{\infty} \beta^t c_t^{1-\sigma(s)} / \left(1-\sigma(s)\right)$$

- coefficient of relative risk aversion $\sigma(s)$ state-specific
- CES preferences over T and N consumption:

$$c = \left[\gamma^{1/\theta} \left(c^T\right)^{\frac{\theta-1}{\theta}} + (1-\gamma)^{1/\theta} \left(c^N\right)^{\frac{\theta-1}{\theta}} \right]^{\frac{\theta}{\theta-1}}$$

- Resource constraints: $c^N = y^N$ and $\alpha c^T + (1-\alpha) c^{*T} = \bar{y}^T$
- Markets are complete internationally.

A Model of Global Disasters and Insurance

Complete market allocation solves the standard planning problem of maximizing a weighted sum of discounted utilities:

$$\max_{\left\{c_t^T, c_t^{*T}, c_t^N, c_t^{*N}\right\}} \mu\alpha\mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t u\left(c_t, s_t\right) + \left(1-\mu\right)\left(1-\alpha\right)\mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t u^*\left(c_t^*, s_t\right) \tag{$\mathcal{P}$}$$

subject to the resource constraints where $\mu \in [0, 1]$ represents the weight given by the planner to Home households.

Because there is no capital in the model, $(\mathcal{P})$ can be solved state-by-state: for each state $s \in \mathcal{S}$, the first-order condition of the problem imposes that the marginal utility of tradable consumption be proportional across states and countries.

Characterization

- With CM, marginal utility of consumptions proportional:

$$c_t^{(1/\theta-\sigma)} \left(c_t^T\right)^{-1/\theta} \kappa^{-1/\theta} = c_t^{*(1/\theta-\sigma^*)} \left(c_t^{*T}\right)^{-1/\theta},$$

  where $\kappa = \left(\mu/\left(1-\mu\right)\right)^{-\theta}$ is a constant that reflects the relative importance of Home vs. Foreign for the planner.

- Inter and intra-temporal elasticities of substitution:
  - $\sigma > 1/\theta$: T and N gross substitutes.
  - $\sigma < 1/\theta$: T and N gross complements
  - $\sigma = 1/\theta$: T and N separable

Characterization

Definition (Planner's allocation)

An equilibrium allocation of the planner's problem ($\mathcal{P}$) is a p-uple $(c(s), c^T(s), c^N(s), c^*(s), c^{*T}(s), c^{*N}(s))$ that solves state-by-state (a) the risk sharing conditions, (b) the resource constraints and where (c) aggregate consumption is defined by the consumption-aggregator.

- Price of domestic non-traded good:

$$q_t = \left(\frac{\gamma y_t^N}{(1-\gamma)\, c_t^T} \right)^{-1/\theta}$$

- Common stochastic discount factor: $E_t \left[M_{t,t+1} R_{t+1} \right] = 1$

$$M_{t,t+1} = \beta \left(\frac{c_{t+1}}{c_t} \right)^{\frac{1}{\theta}-\sigma} \left(\frac{c_{t+1}^T}{c_t^T} \right)^{-1/\theta}$$

Characterization

- Rewrite risk sharing condition as $c^{*T} = xc^T$ with

$$\left(\frac{x}{\kappa}\right)^{\frac{\theta-1}{\theta}} = \frac{\left(\gamma^{1/\theta}\left(\bar{y}^T/\left[\alpha+(1-\alpha)x\right]\right)^{\frac{\theta-1}{\theta}} + (1-\gamma)^{1/\theta}\left(y^N\right)^{\frac{\theta-1}{\theta}}\right)^{\sigma\theta-1}}{\left(\gamma^{1/\theta}\left(x\bar{y}^T/\left[\alpha+(1-\alpha)x\right]\right)^{\frac{\theta-1}{\theta}} + (1-\gamma)^{1/\theta}\left(y^{*N}\right)^{\frac{\theta-1}{\theta}}\right)^{\sigma^*\theta-1}}$$

- when $\sigma^* \geq \sigma > 1/\theta$
  - A decline in y^N raises c^T (fall in x)
  - A decline in $\bar{y}^T$ decreases c^T when $\sigma < \sigma^*$ (increase in x)
  - A decline in y^{*N} decreases c^T (increase in x)

- if endowments are stationary, so are consumptions

Characterization

Proposition (Characterization of the Planner's allocation)

With a stationary endowment process $\mathbf{y}(s) = (\bar{y}^T(s), y^N(s), y^{*N}(s))$, *the equilibrium allocation that solves the Planner's problem* $(\mathcal{P})$ *is fully characterized by the process* $x(s)$ *that solves the risk sharing equation state-by-state.*

Consumption allocations are recovered from
$c^T(s) = \bar{y}^T(s) / [\alpha + (1-\alpha)\, x(s)]$ *and*
$c^{*T}(s) = x(s)\bar{y}^T(s) / [\alpha + (1-\alpha)\, x(s)]$, $c^N(s) = y^N(s)$ *and*
$c^{*N}(s) = y^{*N}(s)$.

Characterization

Stochastic discount factor $M_{t,t+1} \equiv M(\mathbf{y}_t, \mathbf{y}_{t+1})$:

$$\beta \left(\frac{\gamma^{1/\theta} \left(\bar{y}_{t+1}^T / \left[\alpha + (1-\alpha) x_{t+1} \right] \right)^{\frac{\theta-1}{\theta}} + (1-\gamma)^{1/\theta} \left(y_{t+1}^N \right)^{\frac{\theta-1}{\theta}}}{\gamma^{1/\theta} \left(\bar{y}_t^T / \left[\alpha + (1-\alpha) x_t \right] \right)^{\frac{\theta-1}{\theta}} + (1-\gamma)^{1/\theta} \left(y_t^N \right)^{\frac{\theta-1}{\theta}}} \right)^{\frac{1-\sigma\theta}{\theta-1}}$$
$$\left(\frac{\bar{y}_{t+1}^T}{\bar{y}_t^T} \frac{\alpha + (1-\alpha) x_t}{\alpha + (1-\alpha) x_{t+1}} \right)^{-1/\theta}$$

Asset Pricing

The stochastic discount factor constructed can be used to calculate the value of any financial asset. Consider a generic asset with beginning-of-period price $P(s)$ (cum-dividend) in state s that pays a dividend $D(s)$. $P(s)$ must satisfy:

$$\begin{aligned} P(s) &= D(s) + \mathbb{E}\left[M(\mathbf{y}(s), \mathbf{y}(s'))P(s')|s\right] \\ &= D(s) + \sum_{s' \in \mathcal{S}} \pi(s'|s) M(\mathbf{y}(s), \mathbf{y}(s'))P(s') \end{aligned} \tag{1}$$

where the second line spells out the expectation over future states. Define the $\#\mathcal{S} \times 1$ vector $\overline{\mathbf{P}} = (P(s_1), ..., P(s_{\#\mathcal{S}}))'$. Define similarly the vector $\overline{\mathbf{D}}$ and the $\#\mathcal{S} \times \#\mathcal{S}$ matrix $\overline{\mathbf{M}}$ whose (s, s') element is $\pi(s'|s)M(\mathbf{y}(s), \mathbf{y}(s'))$.

Wealth

- The Price equation can be rewritten in matrix form and solved for $\overline{\mathbf{P}}$:

$$\overline{\mathbf{P}} = \left(\bar{\mathbf{I}} - \overline{\mathbf{M}}\right)^{-1} \overline{\mathbf{D}}, \tag{2}$$

  where $\bar{\mathbf{I}}$ is the $\#\mathcal{S} \times \#\mathcal{S}$ identity matrix.

- Denote $W(s)$ the beginning-of-period domestic financial wealth of Home (in units of the traded good). From the country's budget constraint under complete markets:

$$W(s) = P(s)c(s) + \mathbb{E}\left[M(\mathbf{y}(s), \mathbf{y}(s'))\, W(s') | s\right]$$

Net Foreign Asset Position

Denote $V(s)$ the value of a claim to current and future domestic endowment, i.e. the value of the domestic traded and non-traded Lucas trees (in units of the traded good). It satisfies:

$$V(s) = y^T(s) + q(s)y^N(s) + \mathbb{E}\left[M(\mathbf{y}(s), \mathbf{y}(s'))V(s')|s\right].$$

Home's net foreign investment position $NA(s)$ (in units of the traded good) is simply the difference between the country's wealth and the value of its assets:

$$NA(s) = W(s) - V(s) = c^T(s) - y^T(s) + \mathbb{E}\left[M(\mathbf{y}(s), \mathbf{y}(s'))NA(s')|s\right]$$

The first term on the right hand side is the opposite of the trade balance. This expression states that –under complete markets– the net foreign investment position is the value of a claim to current and future trade deficits. In matrix notation:

$$\overline{\mathbf{NA}} = -\left(\bar{\mathbf{I}} - \overline{\mathbf{M}}\right)^{-1}\left(\bar{\mathbf{y}}^T - \bar{\mathbf{c}}^T\right) \tag{3}$$

Analytical Results w/o Disasters

- Exorbitant Privilège (within the two safe assets) if foreign bond return exceeds US bond return :

$$\begin{aligned} \ln E_t R^{*f}_{t+1} - \ln E_t R^{f}_{t+1} &= cov_t\left(\hat{m}_{t,t+1}, \hat{p}_{t+1}\right) - cov_t\left(\hat{m}_{t,t+1}, \hat{p}^*_{t+1}\right) \\ &= (1-\gamma)\, cov_t\left(\hat{m}_{t,t+1}, \hat{q}_{t+1} - \hat{q}^*_{t+1}\right), \end{aligned}$$

- Exorbitant Privilège for US bonds if times of relative scarcity ($\hat{m} > 0$) are times of real appreciation ($\hat{q} > \hat{q}^*$)
- log-linearizing the model:

$$\begin{aligned} \ln E_t R^{*f}_{t+1} - \ln E_t R^{f}_{t+1} = {} & \left((1-\gamma)/\left[1+(\sigma\theta-1)\gamma(1-\alpha)+(\sigma^*\theta-1)\gamma\alpha\right]\right)^2 \frac{\sigma^2_\epsilon}{\theta} \\ & \left[-\gamma(\sigma^*-\sigma)(1+(\sigma\theta-1)\gamma)(1+(\sigma^*\theta-1)\gamma)/(1-\gamma)\right. \\ & +\alpha(\sigma\theta-1)(1+(\sigma^*\theta-1)\gamma)(\sigma+(\sigma^*-\sigma)\gamma\alpha) \\ & \left.-(1-\alpha)(\sigma^*\theta-1)(1+(\sigma\theta-1)\gamma)(\sigma^*-(\sigma^*-\sigma)\gamma(1-\alpha))\right]. \end{aligned}$$

Analytical Results w/o Disasters

- domestic US bond is a poor hedge against:
  - shocks to traded output
  - shocks to foreign non-traded output

  In both cases, risk sharing requires a decline in c^T (net export of traded goods to the rest of the world), so a decline in P and q (real depreciation).

- domestic bond is a good hedge against shocks to domestic non-traded good. They generate a real appreciation.

- in the large ($alpha = 1$), symmetric ($\sigma = \sigma^*$) country limit, only shocks to domestic non-traded good matter (Hassan (2009))

Business Cycles and Disasters

- Output Process:

$$\begin{aligned} \ln y_t^T &= \ln(\gamma) + \epsilon_t^T + v_t \\ \ln y_t^N &= \ln(1-\gamma) + \epsilon_t^N + v_t \end{aligned}$$

$$\begin{aligned} v_s = v_f &= -\ln\left(\bar{p}_d(1-b) + 1 - \bar{p}_d\right) \\ v_d &= \ln(1-b) + v_f \end{aligned}$$

  - Markov process with 3 states
  - $\bar{p}_d$ unconditional probability of state d given transition matrix
  - ϵ^i iid log-normal, sector & country specific;
  - v_t is a stationary Barro-Rietz process:
    - with probability $\bar{p}_d$ output falls by $(1-b)$ across sectors and countries.
- Return on the foreign safe asset is not safe in disaster time: recovery rate $r*$.

Business Cycles, Global Financial Cycle and Disasters

- By varying b, we are changing the left skewness of the output process, keeping expected output constant.
- For given realization of ϵ, output is the same in the safe and fragile states (since $v_s = v_f$).
- Global Financial Cycle [Rey (2013)]: Our model allows risk appetite to change as a function of the state of the world. For instance, the occurrence of a fragile state may be associated with a re-assessment of risk tolerance (i.e. $\sigma_f \geq \sigma_s$ and $\sigma_f^* \geq \sigma_s^*$).
- This triggers precautionary demands, even though the disaster has not occurred yet.
- We explore the role of these 'risk-on' and 'risk-off' transitions .

Estimation of the model

8 Calibrated Parameters:

- γ: 0.25. Share of traded goods
- θ: 1 (el. of subst. b/w T and N)
- α: 0.25; size of home in the world economy
- b: 0.42 collapse in output in disaster (from Barro (2006))
- r: 1 domestic recovery rate
- r^*: 0.4 foreign recovery rate
- Prob of S/F : 0.2
- Prob of S/D : 0 [Barro Ursua]

Estimation of the model

13 Moments to match (10 parameters):

- Exorbitant privilege (excess returns): 2.7 %
- Exorbitant Duty (change in NFA (% GDP)): -14%
- Appreciation of real exchange rate (S to F): 9.1 %
- Trade balance in S (% GDP) : -4.5%
- Net Foreign Asset Position in S (% GDP): -18 %
- Risk Premium in S and F: 4.62%
- Price Earning Ratio in S and F: 19.3%
- St. dev. of output in S: 1.08 %
- St. dev. of net export in S (% GDP): 0.4 %
- Unconditional probability of a disaster state: 9.7 %
- Unconditional probability of a fragile state: 13.2 %
- Probability of disaster given safe or fragile states: 3.7 %
- Probability of disaster given disaster: 83.5% [Barro Ursua]:

Model Simulation

Panel A - Matched Moments (13)

Description	Mnemonic	Estimate	Target	SE
Exorbitant Privilege	$erna_{s\&f}$	1.3946	2.68	0.6769
Exorbitant Duty	$dnayh_{s-f}$	-13.88	-14.01	0.87
Exchange rate appreciation S to F	$drer_{s-f}$	9.1126	9.1	1.1
Home trade balance in S	$tbyh_s$	-4.4829	-4.49	0.14
Risk premium in S and F	$RP_{s\&f}$	5.7843	4.62	1.33
PE ratio in S and F	$PE_{s\&f}$	19.304	19.3	0.27
NFA/Y home in S	$nayh_s$	-18.113	-18.13	0.77
Unconditional prob D $P(d)$	$\bar{p}_d$	9.6811	9.6787	0.41902
Unconditional prob of F $P(f)$	$\bar{p}_f$	13.412	13.175	3.2108
Prob of D given S or F $P(d\|s\ or f)$	$p_{d,f\ or\ s}$	1.5487	3.7	1.6
Prob of D given D $P(d\|d)$	p_{dd}	84.003	83.5	2.7
SD of log Y in S	$sdlny_s$	1.1293	1.0795	0.069475
SD of NX/Y in S	$sdnxy_s$	0.36505	0.40782	0.040257

Model Simulation

Panel B - Estimated parameters (10)

Description	Parameter	Estimate	Standard Error
Risk Aversion Home S	σ_s	1.8665	0.3686
Risk Aversion Foreign S	σ_s^*	1.8665	0.3686
Risk Aversion Home F & D	$\sigma_{f \text{ or } d}$	0.8438	0.1065
Risk Aversion Foreign F& D	$\sigma^*_{f \text{ or } d}$	4.8841	0.2012
Time preference	β	0.9478	0.0030
Foreign vs. Home for planner	κ	0.7289	0.0190
Business cycle SD of logY	σ_ϵ	0.0136	0.0190
Level of Y in steady state	y^m	1.0435	0.0084
Prob of D given S $P(disaster\|safe)$	p_{sd}	0.0171	0.0029
Prob of F given D $P(fragile\|disaster)$	p_{df}	0.1600	0.0264

We use Andrews, Gentzkow and Shapiro 2020 ECTA to study which moment is more important for a given parameter (informativeness) and their 2017 QJE for sensitivy analysis.

Equilibrium Allocations and Expected Returns

- US runs trade deficit in normal times, yet NA position is stable. Small excess return on assets over liabilities (but leveraged). ('exorbitant privilege')
- Implements allocation with leveraged portfolio. Collapse in equity values during disaster while appreciation of safe assets implies a decline in valuation (NA drops). ('exorbitant duty')
- Real appreciation of Dollar assets in fragile times: no "paradox of the reserve curency" (Maggiori (2017)). Increased demand for insurance.
- Large net debt positions increasing in fragile times.
- Model generated equity premium realistic.

The Vanishing Hegemon

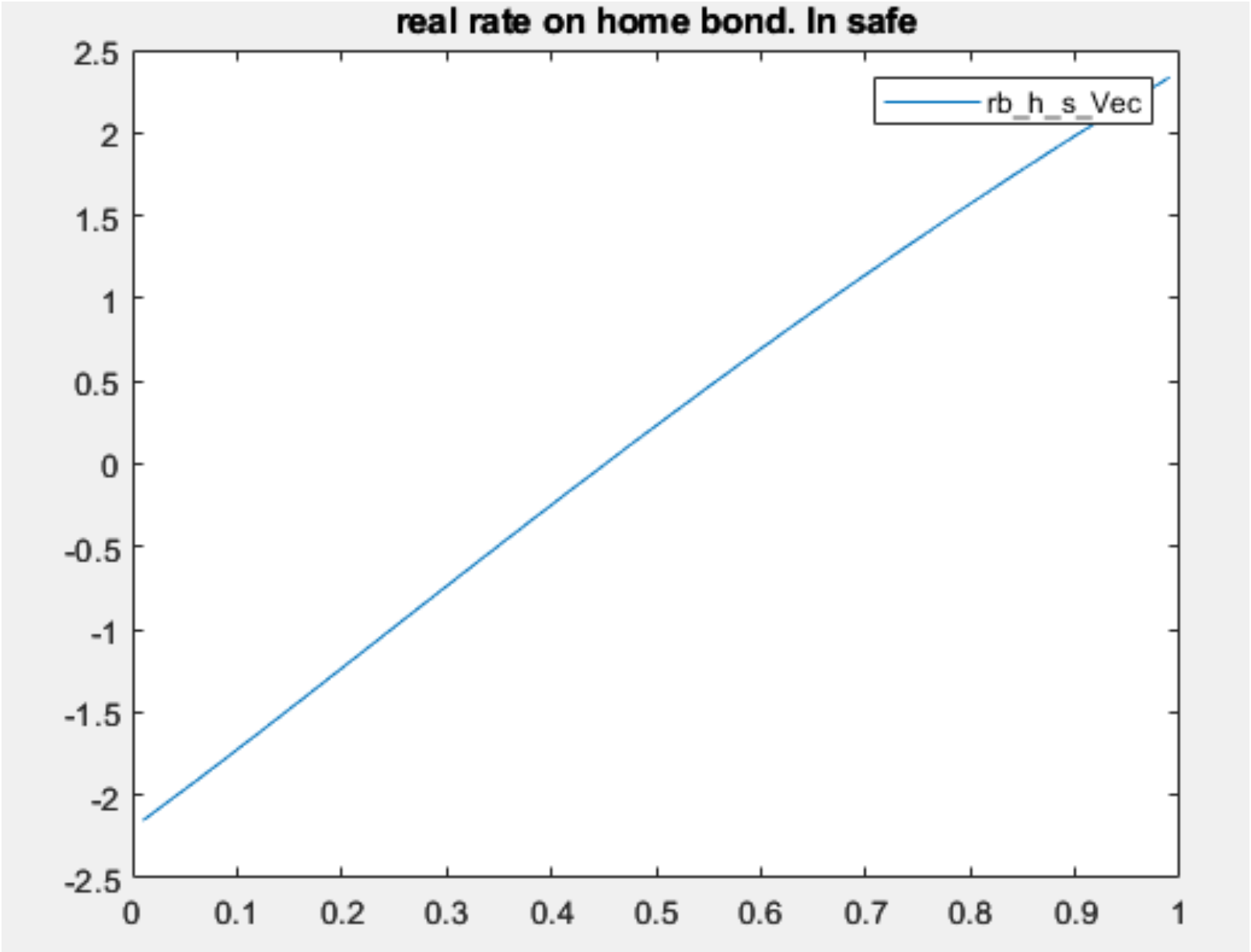
We let the size of the Home country (Hegemon) go down relative to the world economy.

- The NFA position and the net debt exposure go up as a percentage of GDP
- Real appreciation in the fragile state is larger
- Real interest rate is lower as demand for insurance increases relative to the size of the insurer

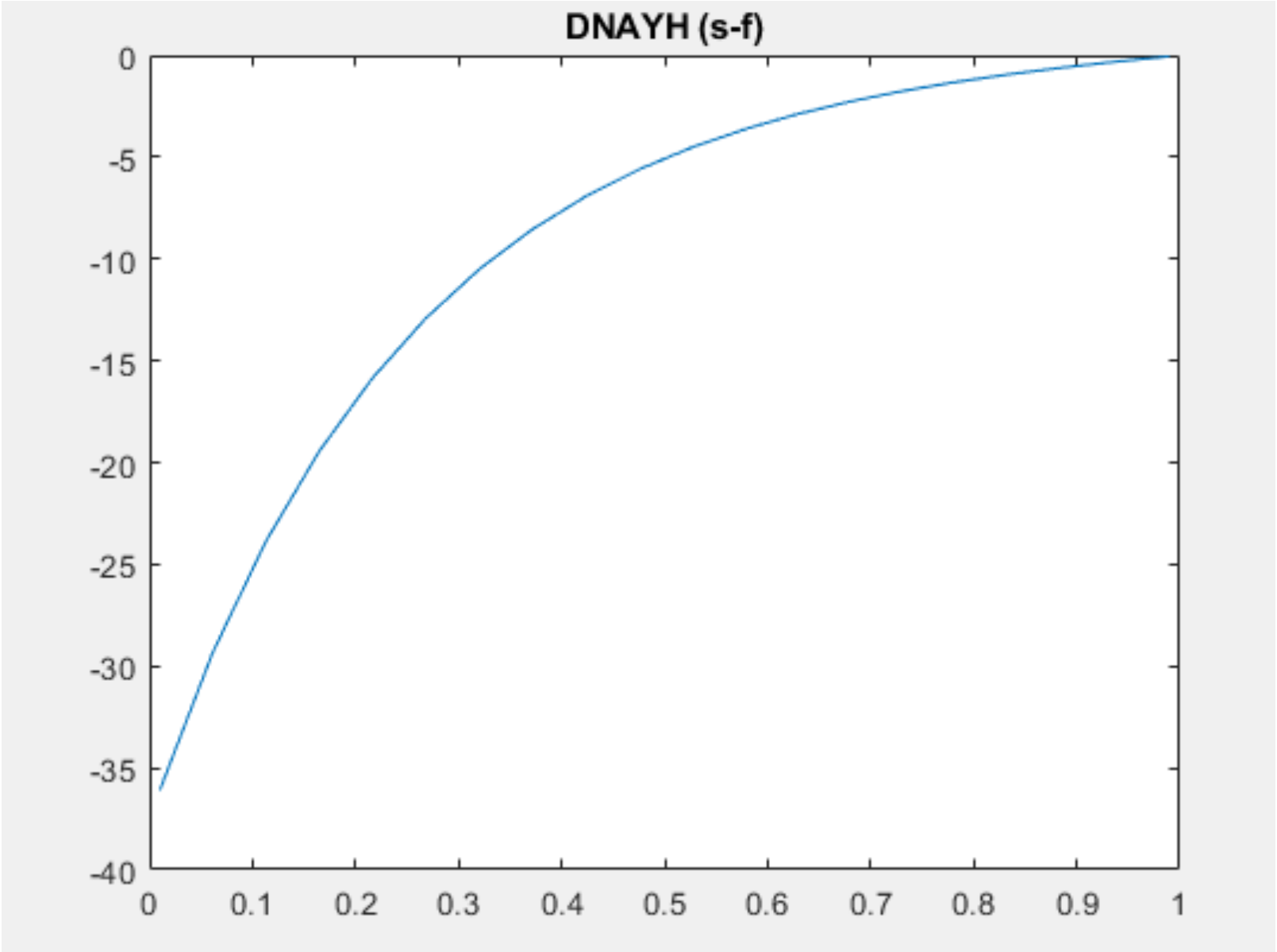
Hence a vanishing Hegemon leads to:

- A lower real interest rate
- A higher volatility in the real exchange rate

Real rate and relative size of the hegemon



Duty: NFA/Y change and size of the hegemon



Conclusion

- Stylized facts:
  - World Banker
  - 'Exorbitant privilege'
  - 'Exorbitant duty'
  - Dollar appreciation
- Our simple model accounts for these facts. Interprets the US as provider of insurance against global shocks. Model emphasizes the role of:
  - greater risk appetite in US (capacity to handle risk)
  - global financial cycle
  - disaster risk (important for wealth transfers)
  - fiscal capacity (haircuts in disaster times)
  - economic size
- Model has interesting implications for real rates and real exchange rate, teh size of duty and privilege when size of the hegemon varies. A shrinking Hegemon lowers the US real safe rate and increases duty.