Unequal Decoupling

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July 2026

Preliminary

Abstract

Who gains and who loses from geopolitical fragmentation in a world of heterogeneous countries? We develop a quantitative general-equilibrium, multi-country heterogeneous-agent framework that incorporates cross-country differences in income risk, wealth inequality, aggregate wealth, capital stocks, and net foreign asset positions, while also capturing rich non-Gaussian income dynamics in both advanced and emerging economies.

We use the model to study two fragmentation scenarios: the closure of the United States and the closure of China to trade and financial flows with the rest of the world. We find that the welfare effects are heterogeneous across countries and within countries, depending on initial external positions and domestic wealth distributions. In the United States, only households at the top of the wealth distribution gain in both scenarios, while most households lose. Outside the United States, average welfare is generally positive when the United States closes, as capital becomes more abundant in other economies, whereas the effects are broadly reversed when China ceases lending. Overall, our results show that geopolitical fragmentation has unequal consequences across heterogeneous countries and across workers and capital owners within each country.

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1 Introduction

Over the past three decades, emerging and advanced economies have become increasingly integrated through trade and finance, with the Global Financial Crisis representing only a temporary interruption. At the same time, income and wealth inequality have risen substantially, especially in advanced economies. Yet the global economy is now increasingly characterized by geopolitical fragmentation, as rising tensions between major powers and the proliferation of economic statecraft measuressuch as sanctions, trade restrictions, and financial decouplingthreaten to disrupt the previously integrated international financial system.

These developments raise questions about the global macroeconomic implications of fragmentation, both within and across countries. If global trade and financial integration were to reverse, who would bear the costs, and who would benefit from a return to financial autarky? How would the economies of both rich and poor countries change if major players such as the United States or China closed themselves to trade and capital flows with the rest of the world?

To address these questions, we develop a quantitative framework by building a multi-country heterogeneous-agent incomplete-markets model that captures international financial integration and disintegration across multiple countries in general equilibrium, while accurately accounting for cross-country differences in (i) net foreign asset positions, aggregate wealth, and capital, (ii) idiosyncratic income risk and its non-Gaussian behavior, and (iii) wealth inequality.[1] To our knowledge, this is the first quantitative model to incorporate such extensive within- and across-country heterogeneity, providing a significant contribution to the international macroeconomics literature. In addition, the paper highlights how correctly accounting for rich income dynamics, and especially for higher-order risk, helps accounting for very skewed distributions of wealth.

We apply our international heterogeneous-agent model to study the aggregate and distributional welfare effects of two geopolitical fragmentation scenarios. These exercises examine what would happen if the United States (a major borrower) or China (a major lender) closed themselves off to international goods and asset markets.

First, consider a scenario in which the United States reduces its net foreign asset position to zero and moves to autarky, possibly as a consequence of aggressive policies to reduce trade deficits, such as tariffs. This shock would contract the global supply of assets, leading to a fall in the interest rate in the rest of the world and a rate rise in the United States. Given the need to generate higher returns, firms in the United States would invest less, resulting

[1] Our baseline multi-country setup explicitly models 12 countries for which we have data on income risk from GRID – namely Argentina, Brazil, Canada, Denmark, Spain, France, Italy, Germany, Mexico, Norway, Sweden and the United States.

in a lower capitaloutput ratio and reducing labor demand and wages. While capital owners benefit from higher returns, workers are worse off in the United States, whereas in the rest of the world, the opposite holds, with returns on capital pushed down by the reduction in the United States external liability position. In terms of welfare, we find that in the United States, only households at the top of the wealth distribution experience welfare gains in both scenarios, while all other households incur losses. Outside the United States, the average welfare outcome is generally positive when the United States closes, owing to capital becoming more abundant in all countries.

Second, consider a scenario in which China ceases lending to the rest of the world and reduces its external wealth to zero, effectively moving to financial autarky. As a major lender, Chinas withdrawal (or exclusion) from financial markets would reduce the global supply of capital, leading to higher returns on capital and lower wages worldwide. In the United States, the drying up of external lending from China would produce outcomes similar to the first scenarioelevating returns on capital and reducing wageswhile outside the United States, this geopolitical fragmentation shock would have very different effects than the contraction in US liabilities, as the return on capital would rise globally. Less wealthy households would be worse off due to lower wages and reduced consumption possibilities, so the welfare implications worldwide of Chinas exclusion differ sharply from those of the United States exclusion.

Related literature. This paper contributes to several strands of the literature. First, it builds on the literature on incomplete markets and heterogeneous agents (Aiyagari, 1994; Bewley, 1986; Imrohoroglu, 1989; Krusell and Smith, 1998), extending these frameworks to incorporate non-Gaussian income risk as documented by Guvenen, Pistaferri and Violante (2022). While prior studies have shown that higher-order moments of income risk are crucial for understanding wealth inequality (Castañeda, Díaz-Giménez and Ríos-Rull, 2003), we explicitly calibrate these dynamics across multiple countries using data from the Global Repository of Income Dynamics (GRID).

Second, this work relates to research on household heterogeneity and global imbalances (de Ferra, Mitman and Romei, 2021; de Ferra, Mitman and Romei, 2020; Auclert et al., 2021) as well as emerging literature on geopolitical risks and their macroeconomic implications (Caldara and Iacoviello, 2022; Clayton, Maggiori and Schreger, 2023, 2024). Different from previous work, we analyze how geopolitical fragmentation interacts with domestic inequality to generate heterogeneous welfare outcomes within and across countries.

2 Model

The world economy consists of J countries, indexed by $j \in \{1, \ldots, J\}$ and a rest of the world. Each country is populated by a unit continuum of households, a representative final-good producer, and a unit continuum of monopolistically competitive intermediate-good producers. Countries differ along several dimensions that are central to the model's cross-country heterogeneity.

First, households within each country face uninsurable idiosyncratic income risk, the extent of which varies across countries. Second, the degree of household patience—captured by country-specific discount factors—also differs internationally. Together, these two sources of heterogeneity endogenously generate dispersion in both the within-country wealth distribution and aggregate net external asset positions across countries.

Third, countries differ in their production technologies. Cross-country variation in factor shares gives rise to international differences in the income accruing to capital and labor, as well as in capital-output ratios. Fourth, the elasticity of substitution across intermediate-good varieties differs across countries. This elasticity governs how readily firms and consumers can substitute between varieties, and can be interpreted as reflecting differences in the underlying technology used to combine intermediate inputs into final output—countries with a higher elasticity possess a more flexible aggregation technology, while those with a lower elasticity face stronger complementarities across varieties. Under monopolistic competition, this technological heterogeneity determines equilibrium markups and, consequently, the share of output accruing to profits.

Time is discrete and indexed by $t \in \{0, 1, \ldots\}$.

The rest of the world has an external asset position defined by $NFA_t^{RoW} > 0$ and it has a trade balance $NX^{RoW,t} < 0$ that satisfies: $NX^{RoW,t} = -NFA_t^{RoW}(1 + r_{t-1}) + NFA_{t+1}^{RoW}$

2.1 Households

Each country j is inhabited by a unit continuum of households indexed by $i \in [0, 1]$. Households are heterogeneous both within and across countries. Within each country, households are ex ante distinguished by a permanent, type-specific discount factor $\beta_{j,s} \in (0, 1)$, where s indexes the household type.[2] Households supply labor inelastically and face uninsurable idiosyncratic shocks to their labor productivity $e_{i,j,t}$. Households cannot move across countries.

[2]We model discount factor heterogeneity following Krueger, Mitman and Perri (2016) and Carroll et al. (2017).

A household of type s in country j chooses consumption and savings to solve:

$$\max_{\{c_{i,j,t},\, a_{i,j,t+1}\}} \mathbb{E}_0 \sum_{t=0}^{\infty} \beta_{j,s}^t \frac{c_{i,j,t}^{1-\gamma}}{1-\gamma} \tag{1}$$

subject to the budget constraint:

$$c_{i,j,t} + a_{i,j,t+1} = (1 + r_{t-1})\, a_{i,j,t} + w_{j,t}\, e_{i,j,t}, \tag{2}$$

and the borrowing constraint:

$$a_{i,j,t+1} \geq 0, \tag{3}$$

where $\mathbb{E}_0$ denotes the expectation operator conditional on information at $t = 0$, $c_{i,j,t}$ is consumption, and $\gamma > 0$ is the coefficient of relative risk aversion.

The household enters period t with wealth $a_{i,j,t}$, which earns the world interest rate r_t. End-of-period savings $a_{i,j,t+1}$ represent the household's portfolio of assets, comprising international bonds, domestic capital, and claims to firm dividends. These assets are assumed to be perfect substitutes, so their returns are equalised in equilibrium, and all asset positions are denominated in units of the consumption good.[3] Labor income is the product of the country-specific wage $w_{j,t}$, also expressed in units of the consumption good, and the household's idiosyncratic productivity draw $e_{i,j,t}$.

The borrowing constraint $a_{i,j,t+1} \geq 0$ prevent households to hold negative net wealth. This rules out unsecured borrowing but does not preclude households from running down their asset holdings; it simply requires that total portfolio wealth remain non-negative at all times.

The maximization of (1) subject to the constraints (2) and (3) yields the Euler equation:

$$c_{i,j,t}^{-\gamma} = \beta_{j,s}(1 + r_t)\, \mathbb{E}_t \left[c_{i,j,t+1}^{-\gamma} \right] + \mu_{i,j,t}, \tag{4}$$

where $\mu_{i,j,t} \geq 0$ is the Lagrange multiplier associated with the borrowing constraint (3). When the borrowing constraint does not bind, $\mu_{i,j,t} = 0$ and (4) reduces to the standard consumption Euler equation. When the constraint binds, $\mu_{i,j,t} > 0$, reflecting the shadow cost of being unable to borrow, which drives a wedge between the current and expected future marginal utility of consumption.

The household problem is completed by the complementary slackness condition:

$$\mu_{i,j,t} \cdot a_{i,j,t+1} = 0, \tag{5}$$

[3] Because these assets are perfect substitutes, households are indifferent over their composition; only total wealth $a_{i,j,t}$ is a state variable.

which states that the borrowing constraint and its associated multiplier cannot both be strictly positive simultaneously: either the household is unconstrained ($\mu_{i,j,t} = 0$) or its wealth is exactly at the constraint boundary ($a_{i,j,t+1} = 0$), but not both.

2.2 Production

The production side of each country consists of a representative final-good producer operating under perfect competition, and a unit continuum of intermediate-good producers operating under monopolistic competition. Intermediate goods are non-tradable and can only be purchased domestically.

Final goods. A representative final-good producer in country j aggregates a continuum of domestic intermediate goods $y_{j,t}(i)$, $i \in [0,1]$, into a final good $Y_{j,t}$ using the CES technology:

$$Y_{j,t} = \left(\int_0^1 y_{j,t}(i)^{\frac{\varepsilon_j - 1}{\varepsilon_j}} \, di \right)^{\frac{\varepsilon_j}{\varepsilon_j - 1}}, \tag{6}$$

where $\varepsilon_j > 1$ is the country-specific elasticity of substitution across intermediate varieties. Heterogeneity in ε_j across countries can be interpreted as reflecting differences in the underlying technology used to aggregate intermediate inputs.

Taking $Y_{j,t}$ as given, the final-good producer chooses $y_{j,t}(i)$ to maximise:

$$\max_{\{y_{j,t}(i)\}} \; Y_{j,t} - \int_0^1 p_{j,t}(i)\, y_{j,t}(i)\, di, \tag{7}$$

subject to (6). The final good is homogeneous across countries and serves as the numeraire, so $P_{j,t} = 1$ for all j and t. The resulting demand for variety i is:

$$y_{j,t}(i) = p_{j,t}(i)^{-\varepsilon_j} Y_{j,t}, \tag{8}$$

which is decreasing in the variety's own price and increasing in aggregate output.

Intermediate goods. Each intermediate-good producer i in country j operates a Cobb-Douglas technology:

$$y_{j,t}(i) = Z_j \, k_{j,t}(i)^{\alpha_j} \, l_{j,t}(i)^{1-\alpha_j}, \tag{9}$$

where $k_{j,t}(i)$ and $l_{j,t}(i)$ denote capital and effective labor hired from competitive factor markets, $\alpha_j \in (0,1)$ is the capital share, and $Z_j > 0$ is a time-invariant, country-specific productivity level. where $\delta \in (0,1)$ is the depreciation rate and $I_{j,t}(i)$ is firm-level investment.

Each intermediate-good producer sets its price to maximise the present discounted value of profits:

$$\max_{p_{j,t}(i)} \; p_{j,t}(i)\, y_{j,t}(i) - r_t^K\, k_{j,t}(i) - w_{j,t}\, l_{j,t}(i), \tag{10}$$

subject to the technology constraint (9), and the demand schedule (8). The first-order conditions for capital and labor yield:

$$r_{j,t}^K = \frac{\varepsilon_j - 1}{\varepsilon_j}\, \alpha_j Z_j\, k_{j,t}(i)^{\alpha_j - 1} l_{j,t}(i)^{1-\alpha_j}, \tag{11}$$

$$w_{j,t} = \frac{\varepsilon_j - 1}{\varepsilon_j}\, (1-\alpha_j) Z_j\, k_{j,t}(i)^{\alpha_j} l_{j,t}(i)^{-\alpha_j}. \tag{12}$$

The term $(\varepsilon_j - 1)/\varepsilon_j < 1$ is the inverse of the markup, reflecting the wedge between price and marginal cost under monopolistic competition. By symmetry, all intermediate-good producers within country j choose identical factor inputs and set the same price, $p_{j,t}(i) = P_{j,t} = 1$. Aggregating across firms, the economy-wide factor market clearing conditions become:

$$r_t^K = \frac{\varepsilon_j - 1}{\varepsilon_j}\, \alpha_j Z_j K_{j,t}^{\alpha_j - 1} L_{j,t}^{1-\alpha_j}, \tag{13}$$

$$w_{j,t} = \frac{\varepsilon_j - 1}{\varepsilon_j}\, (1-\alpha_j) Z_j K_{j,t}^{\alpha_j} L_{j,t}^{-\alpha_j}, \tag{14}$$

where

$$K_{j,t} \equiv \int_0^1 k_{j,t}(i)\, di \tag{15}$$

is aggregate capital and

$$L_{j,t} \equiv \mathbb{E}_{[} e_{i,j,t}] \tag{16}$$

is aggregate effective labor supply.

Profits, asset pricing, and capital accumulation. Under monopolistic competition with flexible prices, each intermediate-good producer earns per-period profits equal to a fixed fraction of revenue:

$$d_{j,t} = \frac{1}{\varepsilon_j}\, Y_{j,t}. \tag{17}$$

A higher elasticity ε_j – reflecting a more competitive environment or a more flexible aggregation technology – compresses markups and reduces the profit share. These profits are distributed to shareholders as dividends.

Shares in each country's intermediate-good sector are traded on a stock market. Normalising the number of outstanding shares to one, the ex-dividend share price $Q_{j,t}$ satisfies the

standard asset-pricing recursion:

$$Q_{j,t} = \frac{d_{j,t+1} + Q_{j,t+1}}{1 + r_t}. \tag{18}$$

In each country j, a unit-mass continuum of competitive firms produce investment goods, converting the final good into investment subject to a convex adjustment cost. Taking the aggregate capital stock $K_{j,t}$ and the price of capital $q^K_{j,t}$ as given, the representative investment-good producer chooses investment $I_{j,t}$ to solve:

$$\max_{I_{j,t}} \Pi_{I,j,t} = q^K_{j,t} I_{j,t} - \left[I_{j,t} + \frac{\chi}{2} \left(\frac{I_{j,t}}{K_{j,t}} - \delta \right)^2 K_{j,t} \right], \tag{19}$$

and capital accumulates according to:

$$K_{j,t+1} = (1 - \delta) K_{j,t} + I_{j,t}. \tag{20}$$

The first-order condition for (19) is:

$$q^K_{j,t} = 1 + \chi \left(\frac{I_{j,t}}{K_{j,t}} - \delta \right) = 1 + \chi \frac{K_{j,t+1} - K_{j,t}}{K_{j,t}}, \tag{21}$$

where the second equality uses (20). Equivalently, the investment rate is increasing in the price of capital,

$$\frac{I_{j,t}}{K_{j,t}} = \delta + \frac{q^K_{j,t} - 1}{\chi}, \tag{22}$$

the model's q-theory of investment.

As described in Section 2.1, households hold international bonds, domestic capital, and equity claims as perfect substitutes, so their returns are equalised in equilibrium. A household purchasing one unit of capital in country j at price $q^K_{j,t}$ receives the rental rate $r^K_{j,t+1}$ next period and can resell the undepreciated unit at price $q^K_{j,t+1}$. No-arbitrage across bonds, capital, and equity therefore requires:

$$1 + r_t = \frac{r^K_{j,t+1} + (1 - \delta) q^K_{j,t+1}}{q^K_{j,t}} = \frac{d_{j,t+1} + Q_{j,t+1}}{Q_{j,t}}, \qquad \forall j. \tag{23}$$

The middle term is the gross return to holding domestic capital from t to $t+1$; the right-hand term is the gross return to domestic equity. Together with (20) and (21), condition (23) pins down the equilibrium price of capital and investment rate in each country.

2.3 Equilibrium

Let the individual state of a household in country j be denoted by

$$x \equiv (a, e, s),$$

where $a \geq 0$ is wealth, e is the household's idiosyncratic labor productivity state, and s is the household's permanent discount-factor type. Let $\Pi_j(de' \mid e)$ denote the matrix of Markov transition probabilities implied by the income process. The aggregate state of the world economy is

$$S = (\mathbf{\Gamma}, \mathbf{K}, NFA^{RoW}),$$

where

$$\mathbf{\Gamma} \equiv (\Gamma_1, \ldots, \Gamma_J)$$

is the collection of country-specific cross-sectional household distributions, and

$$\mathbf{K} \equiv (K_1, \ldots, K_J)$$

is the international distribution of installed capital, and NFA^{RoW} is the external asset position of the rest of the world.

The rest-of-world trade balance satisfies

$$NX^{RoW} = -NFA^{RoW}\,(1 + r) + NFA^{RoW\prime}.$$

With this sign convention, $NX^{RoW} < 0$ means that the rest of the world runs a trade deficit against the model economies.

A recursive equilibrium is a collection of household policy functions

$$\{c_{j,s}(a, e),\ a'_{j,s}(a, e)\}_{j,s},$$

an aggregate capital-allocation policy

$$\{K'_j\}_{j=1}^{J},$$

a law of motion for the aggregate state

$$S' = \mathcal{G}(S),$$

prices

$$r, \qquad \{w_j, r_j^K, Q_j\}_{j=1}^J,$$

and aggregate quantities

$$\{C_j, L_j, Y_j, I_j, d_j\}_{j=1}^J$$

such that the following conditions hold.

1. Household optimality. Given prices and the aggregate law of motion $\mathcal{G}$, for every country j, type s, and individual state (a, e), the policy functions $c_{j,s}(a, e)$ and $a'_{j,s}(a, e)$ solve the household problem in (1), subject to (2) and (3). Therefore, the budget constraint (2) and the optimality conditions (4) and (5) hold.

2. Firm optimization. Given the current distribution of installed capital $\mathbf{K}$, aggregate effective labor in country j follows from (16). Aggregate output follows from the technology in (9) and, given symmetry,

$$Y_{j,t} = y_{j,t}(i)$$

.

The current wage and current rental rate of installed capital satisfy (14) and (13).

3. Capital accumulation and future capital-market no-arbitrage. The aggregate capital-allocation policy determines next period's installed capital,

$$K'_j = \mathcal{K}_j(S),$$

and investment is

$$I_j = K'_j - (1 - \delta) K_j.$$

The price of capital q_j^K satisfies the investment-good producers' first-order condition,

$$q_j^K = 1 + \chi \left(\frac{I_j}{K_j} - \delta \right).$$

Let next period's rental rate of capital be

$$r_j^{K\prime} = \frac{\varepsilon_j - 1}{\varepsilon_j} \alpha_j Z_j (K'_j)^{\alpha_j - 1} (L'_j)^{1-\alpha_j},$$

and let $q_j^{K\prime}$ denote next period's price of capital, evaluated analogously at the state S'. Since capital purchased today becomes productive, and can be resold net of depreciation, next

period, no-arbitrage requires that the gross return to holding capital equal the gross world interest rate:

$$\frac{r_j^{K\prime} + (1-\delta)\, q_j^{K\prime}}{q_j^K} = 1 + r, \qquad \forall j.$$

Unlike in the frictionless case, this condition no longer requires the rental rate $r_j^{K\prime}$ itself to be equalized across countries; instead, the country-specific price of capital q_j^K absorbs the gap between a country's marginal product of capital and the world return, and capital reallocates across countries only gradually as K_j converges over time. Setting $\chi = 0$ collapses this condition to $r_j^{K\prime} = r + \delta$, recovering the frictionless benchmark.

4. Equity pricing. Shares in the intermediate-good sector of country j are claims to the future profit stream $\{d_j\}$. The ex-dividend equity price satisfies

$$Q_j = \frac{d_j' + Q_j'}{1+r},$$

where d_j' and Q_j' are evaluated at the next aggregate state S'.

5. Evolution of household distributions. The next-period household distribution in country j is induced by the current distribution, the household saving policy, and the transition kernel for idiosyncratic productivity. For any measurable sets $A \subseteq \mathbb{R}_+$ and $E \subseteq \mathcal{E}_j$,

$$\Gamma_j'(A \times E \times \{s\}) = \int_{\mathbb{R}_+ \times \mathcal{E}_j \times \{s\}} \mathbf{1}\{a_{j,s}'(a,e) \in A\} \Pi_j(E \mid e)\, d\Gamma_j(a,e,s).$$

Thus,

$$\Gamma_j' = \mathcal{G}_{\Gamma,j}(S).$$

6. Asset-market clearing. Aggregate household saving in country j is

$$A_j' = \int a_{j,s}'(a,e)\, d\Gamma_j(a,e,s).$$

In the presence of the rest of the world, claims to the capital stock and to monopoly profits are held both by households in the J model economies and by the rest of the world. The world asset-market clearing condition is

$$\sum_{j=1}^{J} A_j' + NFA^{RoW\prime} = \sum_{j=1}^{J} K_j' + \sum_{j=1}^{J} Q_j.$$

7. Goods-market clearing. Aggregate consumption in country j is

$$C_j = \int c_{j,s}(a, e)\, d\Gamma_j(a, e, s).$$

The trade balance of the block of J model economies is the negative of the rest-of-world trade balance:

$$NX = -NX^{RoW}.$$

Therefore world goods-market clearing for the J model economies requires

$$\sum_{j=1}^{J} C_j + \sum_{j=1}^{J} I_j = \sum_{j=1}^{J} Y_j + NX^{RoW}.$$

8. Consistency of the aggregate law of motion. The aggregate law of motion is generated by equilibrium household policies, the idiosyncratic productivity process, and the aggregate capital-allocation policy:

$$\mathcal{G}(S) = \left(\Gamma_1', \ldots, \Gamma_J', K_1', \ldots, K_J'\right).$$

2.4 Calibration

World parameters. We set the world interest rate to $r = 0.01$, consistent with recent estimates of the long-run real interest rate (Del Negro et al., 2019; Holston, Laubach and Williams, 2017; Rachel and Smith, 2017).

We set the coefficient of relative risk aversion to $\gamma = 1$, corresponding to logarithmic utility, in line with the standard calibration in the incomplete-markets literature (Aiyagari, 1994). The annual depreciation rate is set to $\delta = 0.05$, a value widely used in the quantitative macroeconomics literature (Cooley and Prescott, 1995; Gomme and Rupert, 2007).

These three parameters are common to all countries.

Production technology. For each country j, we calibrate the productivity level Z_j, the capital share α_j, and the elasticity of substitution across intermediate varieties ε_j. We treat the United States separately from the remaining countries, as its aggregate wealth contains a significant component of pure monopoly rents that must be identified and separated from physical capital.

United States. For the United States, we allow for $\varepsilon_{US} < \infty$, so that intermediate-good producers earn positive profits in equilibrium. We identify the steady-state value of these profits as follows. We begin by constructing the aggregate stock market value Q_{US}. From

the net market value of national wealth—taken from the World Inequality Database (World Inequality Database, 2024)—we subtract the net foreign asset position B_{US}, the value of agricultural land, and the replacement cost of physical capital, measured as the net capital stock at current purchasing power parities from the Penn World Tables (Feenstra, Inklaar and Timmer, 2015). Multiplying by the world interest rate r then gives the steady-state profit share of output:

$$\frac{d_{US}}{Y_{US}} = r \cdot \frac{Q_{US}}{Y_{US}}. \tag{24}$$

Since under monopolistic competition the profit share equals $1/\varepsilon_{US}$, this identifies the elasticity of substitution. Our procedure yields a markup of 1.018 and a corresponding elasticity of $\varepsilon_{US} = 5.637$, consistent with the time-series evidence in Atkeson, Heathcote and Perri (2025).

With the profit share identified, we recover the capital-to-output ratio for the United States as follows. We take the ratio of net national non-financial assets to net national income from WID as a measure of $(K_{US} + Q_{US})/Y_{US}$, and subtract our estimated Q_{US}/Y_{US} to obtain $K_{US}/Y_{US} = 4.073$. This is meaningfully lower than the perfect-competition benchmark of $K^{PC}_{US}/Y_{US} = 5.847$, which would attribute the entire residual domestic wealth to physical capital. We then set α_{US} to match this value via the steady-state condition $\alpha_{US} = (K_{US}/Y_{US}) \cdot (r + \delta)$, yielding $\alpha_{US} = 0.249$ under monopolistic competition, compared with $\alpha^{PC}_{US} = 0.351$ under perfect competition.

Non-U.S. model economies. For all remaining countries, we set $\varepsilon_j \to \infty$, so that intermediate goods are perfect substitutes, markups are zero, and the production side of each economy reduces to a standard competitive Cobb-Douglas technology. Since no pure profits arise, the entire residual domestic wealth net of the net foreign asset position is attributed to physical capital, and the two market structures coincide: $K^{PC}_j = K^{MC}_j$ and $\alpha^{PC}_j = \alpha^{MC}_j$ for all $j \neq US$. We calibrate α_j to match the capital-to-output ratio in each country, constructed from the ratio of net national non-financial assets to net national income from WID (World Inequality Database, 2024), via:

$$\alpha_j = \frac{K_j}{Y_j} \cdot (r + \delta). \tag{25}$$

The resulting capital stocks and capital shares for all countries, under both market structures, are reported in Table 1. The United States is the only country for which the two columns differ, reflecting the presence of monopolistic rents in its aggregate wealth.

In all countries, given aggregate effective labor $L_j = 1$ in steady state, productivity is pinned down by the normalization $Z_j = K_j^{-\alpha_j}$, which ensures that output equals one in every country's steady state. The implied values of α_j under our baseline monopolistic competition

Table 1: Capital stocks and capital shares under perfect and monopolistic competition

Country	K/Y	α
ARG	3.190	0.191
BRA	4.987	0.299
CAN	5.592	0.336
DNK	4.751	0.285
ESP	7.589	0.455
FRA	6.342	0.381
DEU	5.541	0.332
ITA	5.985	0.359
MEX	4.737	0.284
NOR	4.202	0.252
SWE	5.628	0.338
USA^{MC}	4.073	0.249
USA^{PC}	5.847	0.351

Notes: K/Y denotes the capital-to-output ratio and α the capital share, under perfect competition (PC) and monopolistic competition (MC). Under perfect competition, total domestic wealth net of the net foreign asset position is attributed entirely to physical capital. Under monopolistic competition, the present discounted value of pure profits is subtracted from domestic wealth before computing the capital stock, using the markup identified from Atkeson, Heathcote and Perri (2025) for the United States; all other countries have $\varepsilon_j \to \infty$ so the two columns coincide. Capital and income data are from World Inequality Database (2024).

specification are reported in the final column of Table 1.

Household parameters.

Idiosyncratic income risk. Household labor endowments follow a persistent-transitory stochastic process that captures non-zero skewness and high kurtosis in log earnings changes, as well as their persistence over time.[4] The process for the labor endowment e_t is:

$$\log(e_t) = z_t + \varepsilon_t, \tag{26}$$

$$z_t = \rho z_{t-1} + \eta_t, \tag{27}$$

$$\varepsilon_t \sim \mathcal{N}(0, \sigma_\varepsilon^2),$$

$$\eta_t \sim \begin{cases} \mathcal{N}(\mu_{\eta 1}, \sigma_{\eta 1}^2) & \text{with probability } \theta \\ \mathcal{N}(\mu_{\eta 2}, \sigma_{\eta 2}^2) & \text{with probability } 1-\theta, \end{cases}$$

[4] As shown in Guvenen et al. (2021) and Guvenen, Pistaferri and Violante (2022), changes in log residual earnings exhibit strong non-Gaussian skewness and kurtosis at both short (1-year) and longer horizons.

where z_t is the persistent component and ε_t is the transitory component. The persistent component follows a stationary AR(1) process with shocks drawn from a Gaussian mixture; transitory shocks are i.i.d. normal with mean zero. The restriction $\mu_{\eta 2} = -\theta\mu_{\eta 1}/(1-\theta)$ ensures $\mathbb{E}(\eta) = 0$. The process is fully described by the six-parameter vector $\Omega = [\mu_{\eta 1}, \sigma_{\eta 1}, \sigma_{\eta 2}, \theta, \rho, \sigma_\varepsilon]$.

Let $\mathcal{E}_j$ denote the state space of idiosyncratic productivity in country j, and let $\pi_j(e' \mid e)$ denote the transition kernel over $\mathcal{E}_j$ induced by the income process above. When the income process is discretized, $\mathcal{E}_j$ corresponds to a finite grid of productivity states and π_j to the associated transition matrix, with stationary distribution μ_j. We discuss the country-by-country calibration of Ω in Section 2.4. As shown by Civale, Díez-Catalán and Fazilet (2017), this specification can accurately capture the variance, skewness, and kurtosis of log income changes at both 1-year horizons, $\Delta \log e_t \equiv \log e_t - \log e_{t-1}$, and longer horizons $\Delta_k \log e_t \equiv \log e_t - \log e_{t-k}$ for $k > 1$.

Time preferences. Households exhibit heterogeneity in time preferences both across and within countries. Across countries, we allow each country to have a distinct mean discount factor $\bar{\beta}_j$. This cross-country variation in patience is the key driver of international differences in aggregate saving and net foreign asset positions in the model. Heterogeneous discount factors across countries can be given a demographic interpretation: countries with older populations tend to have accumulated more wealth relative to income, and can therefore be associated with higher average patience (Auclert et al., 2021).

Within each country, we introduce ex-ante discount factor heterogeneity to match the empirical wealth distribution. Specifically, we assume that discount factors are uniformly distributed on $[\bar{\beta}_j - \zeta_j, \bar{\beta}_j + \zeta_j]$, and jointly choose $(\bar{\beta}_j, \zeta_j)$ to target both the aggregate net-wealth-to-income ratio A_j/Y_j from WID (World Inequality Database, 2024) and a vector of cumulative wealth shares $\boldsymbol{\psi}_j = [\psi_{80}, \psi_{60}, \psi_{40}, \psi_{20}]$, where ψ_x denotes the share of total wealth held by the top x% of households, following Carroll et al. (2017).[5]

Table **??** summarizes the calibration for the United States; Appendix B reports the full details for all 12 countries. In all cases, we are able to jointly match the targeted moments of income risk and wealth inequality.

[5] We discretize the uniform distribution using 5 equally-weighted points. Increasing the number of points does not materially affect calibration accuracy.

3 The Role of Non-Gaussian Income Risk for Global Imbalances and Wealth Inequality

This section describes the implications of accounting for the non-Gaussian properties of idiosyncratic income risk in our incomplete-markets model. Incorporating negative skewness and high kurtosis in household income shocks implies that, in any given period, (1) agents are more likely to face large negative shocks than large positive ones, and (2) most agents experience small changes in earnings relative to overall dispersion, while a few experience extremely large shocks. We show that these features matter along several dimensions that we do *not* target in calibration. Most importantly for the international focus of this paper, richer income risk sharpens the model's ability to replicate the cross-country distribution of net foreign asset positions; it also improves the fit of the within-country wealth distribution and of the income distribution in levels.

Untargeted moments: net foreign asset positions. We begin with the dimension most central to our analysis: the cross-country distribution of net foreign asset (NFA) positions. We assess whether richer, non-Gaussian income risk helps the model match countries' NFA positions, even though no moment of the cross-country NFA distribution is targeted in calibration. To separate the role of higher-order income risk from cross-country variation in patience, we impose a coarse two-group discount factor structure: one common β for Argentina, Brazil, and Mexico, calibrated so that the model matches the *sum* of their NFA positions in the data, and a second common β for the remaining advanced economies, calibrated analogously. We compare three nested calibrations of the income process: a Gaussian specification targeting only the variance of income changes ($m = 2$), an intermediate specification that also matches skewness ($m = 3$), and the full baseline that additionally targets kurtosis ($m = 4$). In each case we regress the model-implied NFA-to-GDP ratio on its empirical counterpart, without re-targeting any individual country's NFA position.

Figure 1 summarises the results across three samples. Panel (a) restricts attention to advanced economies excluding Germany and shows a monotone improvement as higher-order moments are added: the R^2 rises from 0.18 under the Gaussian specification to 0.31 once skewness is targeted, and to 0.42 under the full baseline. Simultaneously, the regression slope falls from 0.67 to 0.82 to 1.34, approaching the 45-degree benchmark of a perfect cross-country fit. Panel (b) extends the sample to all countries excluding Germany. The same qualitative pattern holds—the baseline delivers a higher R^2 of 0.21 relative to 0.11 and 0.10 for the Gaussian and skewness-only specifications, respectively—though the gains are more moderate, reflecting the greater heterogeneity in institutions and structural factors across emerging and advanced economies. Panel (c) includes Germany and reveals it to be a clear

outlier: the R^2 is low and essentially unchanged across specifications (0.06, 0.06, and 0.10 for $m = 2$, $m = 3$, and $m = 4$), and the slope substantially exceeds one in all cases (1.33, 1.55, and 1.68). Targeting higher moments makes Germany's equilibrium NFA position particularly sensitive to its discount factor: fitting its low income variance together with high implied kurtosis requires very little additional precautionary saving, leaving its NFA position poorly pinned down.

Taken together, these results indicate that richer income risk monotonically improves the model's ability to replicate the cross-country distribution of NFA positions—most clearly for advanced economies—even though no NFA moment is targeted in the calibration of Ω. The full baseline ($m = 4$) consistently delivers the highest R^2 and the slope closest to unity across all samples.

Wealth and income distributions. The same non-Gaussian features that improve the model's cross-country fit also shape outcomes within countries. As seen in Figure 2a, in a model with ex-ante identical preferences, embedding non-Gaussian income risk implies a much closer match of empirical patterns in wealth inequality relative to a model with a standard Gaussian process – i.e. one that only targets the variance of income changes and assumes a symmetric distribution without fat tails. This is particularly true for the right tail of the wealth distribution. Indeed, incorporating non-Gaussian behavior in income generates a 40% improvement in the accuracy of the (untargeted) wealth distribution vis-à-vis the data relative to the Gaussian counterpart.[6] To ensure that we correctly capture the entire shape of the wealth distribution for our quantitative exercise, we then impose ex-ante heterogeneity in time preferences, which accurately captures the remaining 60% of the gap.

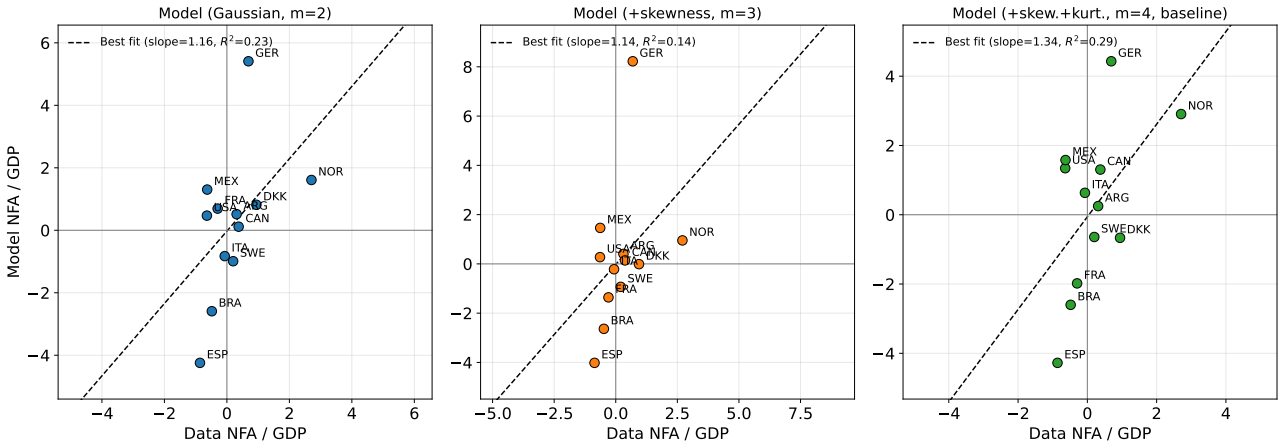
Furthermore, our stochastic process for income changes is also able to accurately capture the shape of the income distribution in levels. Figure 2b compares the income distribution in levels – which we do not target in our model – to the one implied by the stationary distribution of our Markov process. The model captures empirical patterns of income inequality, particularly the concentration of income at the top quintile of the distribution.

The roles of kurtosis and skewness. The mechanism behind both results is the shape of the income process. Accounting for high kurtosis in income changes – and its persistence – is particularly important. A small fraction of agents experience large, persistent positive income shocks, enabling them to accumulate significant wealth through continued savings. This generates a long right tail in the asset distribution, leading to wealth concentration at

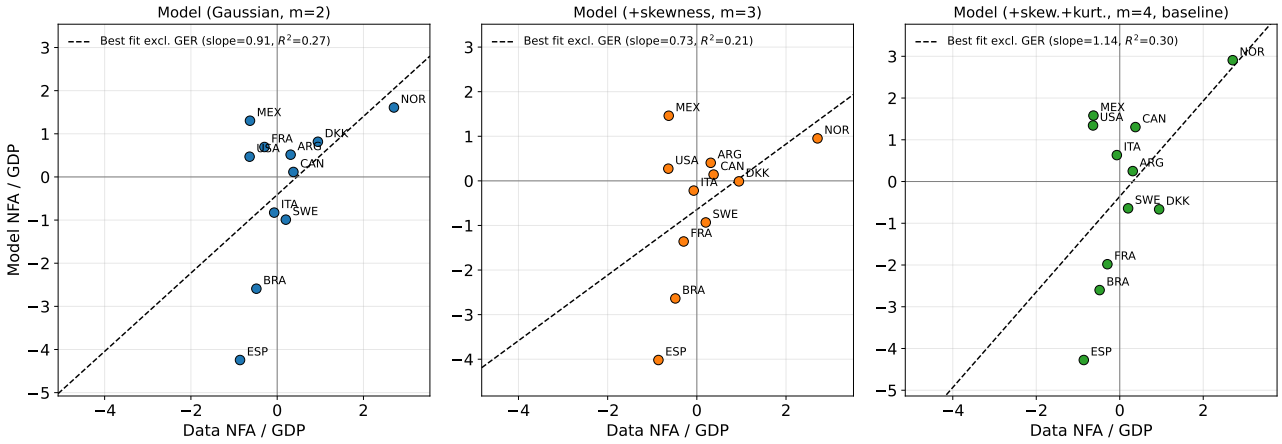
[6]The distance metric used is a simple sum of absolute differences (L1 norm) between the discrete percentile points in each model-implied Lorenz curve (i.e. the red and yellow dashed lines) relative to the empirical counterpart (blue, solid line). The distance metric for the model with non-Gaussian risk is 40% lower than that for the Gaussian counterpart.

Figure 1: Model-implied vs. empirical NFA positions: untargeted moments

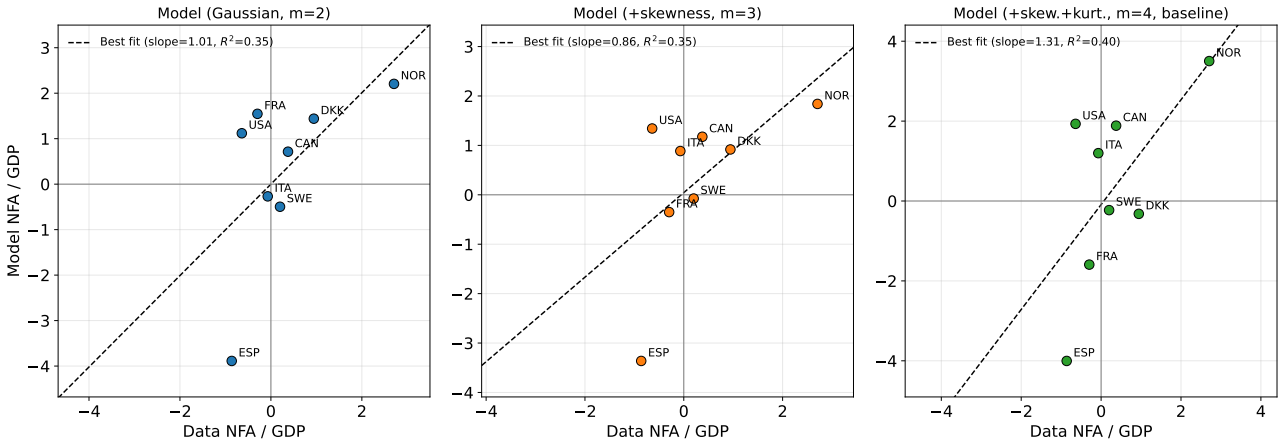
(a) All countries



(b) All countries, excluding Germany



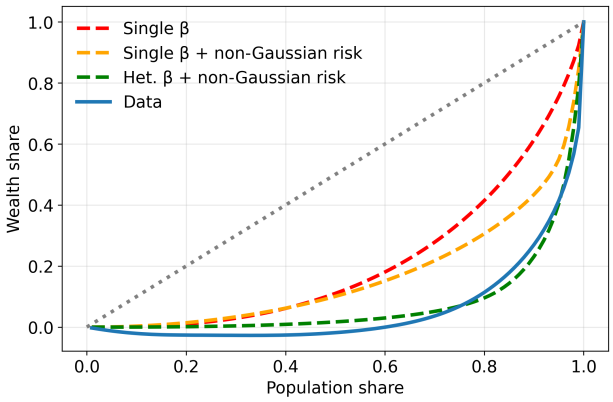
(c) Advanced economies, excluding Germany



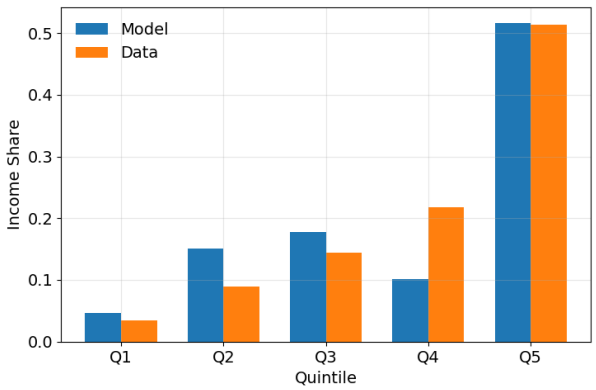
Notes: Each subfigure plots the model-implied NFA-to-GDP ratio against its empirical counterpart (WID) across countries, under a two-group discount factor calibration targeting the sum of NFA positions within each group. Within each subfigure, the three panels correspond to three nested specifications of the income process: Gaussian ($m = 2$, targeting only the variance of income changes), Gaussian with skewness ($m = 3$), and the full baseline with skewness and kurtosis ($m = 4$). The dashed line is the OLS best-fit line; slope and R^2 are reported in each panel.

Figure 2: Income and Wealth Distributions in the US

(a) Wealth distribution by model type



(b) Income distribution by quintile



the top. As demonstrated in Figure 3, calibrations of the US income process that increase the kurtosis of 1- and 5-year income changes (while holding the second and third moments constant) result in greater wealth inequality as well as larger aggregate wealth, due to both a longer right tail and higher precautionary savings of agents close to the borrowing constraint.

This finding echoes the insight in Castañeda, Díaz-Giménez and Ríos-Rull (2003) – the Pareto tail in wealth is driven by a Pareto tail in income shocks. However, while they parameterize the income process to directly match the wealth distribution, we instead calibrate our model's income process to match observed income dynamics, with a specific focus on capturing the non-Gaussian features of income changes. This allows us to explicitly model the impact of extreme income shocks on wealth accumulation, rather than inferring the income process from the resulting wealth distribution. By targeting income dynamics directly, we can assess the independent role of higher-order moments in shaping wealth inequality.

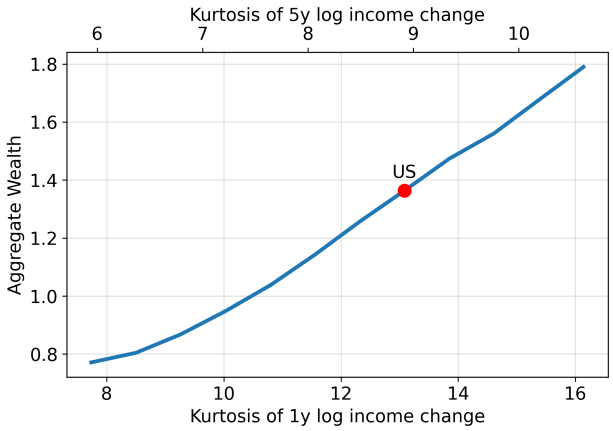
Interestingly, negative skewness has the opposite effect, as shown in Figure A.2 in Appendix A. All else equal, larger negative skewness in income leads to lower wealth inequality and aggregate wealth. A higher probability of negative shocks makes it harder for agents to accumulate large wealth positions, reducing the right tail and thus wealth dispersion. At the aggregate, while negative skewness increases precautionary savings close to the borrowing constraint, the quantitative effect of the thinning right tail dominates.

4 Geopolitical Fragmentation

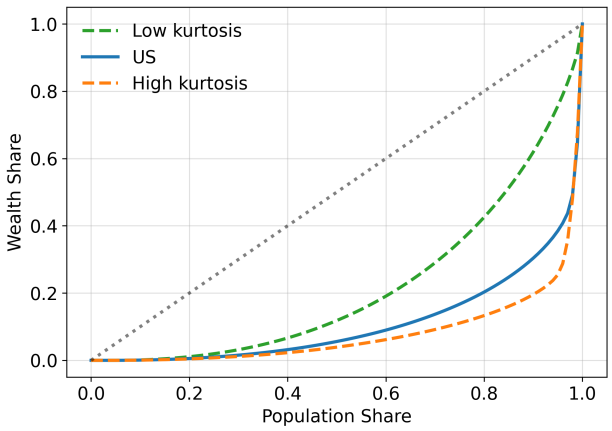
We now examine the global implications of financial fragmentation by considering two main scenarios. First, we analyze the consequences of the United States bringing both its net external asset position and current account balance to zero. Since the United States has net external

Figure 3: Comparative statics for different kurtosis calibrations

(a) Aggregate wealth



(b) Wealth distribution



liabilities vis-à-vis the rest of the world, we distinguish between two cases: one in which it defaults on its obligations to foreign creditors, and another in which it repays those liabilities in full. Second, we consider a scenario in which the 12-country group at the center of our analysis closes its aggregate external liability position vis-à-vis the rest of the world. This exercise illustrates the global implications of a sharp reduction in Chinese external lending.

We analyze these financial-fragmentation shocks in two steps. First, we outline the new stationary allocation that emerges after fragmentation, and we compare it with the initial allocation where international financial markets are integrated. Second, we study the transition dynamics from the initial allocation to the post-fragmentation equilibrium.

4.1 United States Decoupling Scenario

The first financial-fragmentation scenario is a U.S. decoupling shock, in which the United States eliminates its net external position vis-à-vis foreign creditors. In the new stationary allocation, the U.S. net external asset position is therefore zero, regardless of whether the adjustment occurs through default on foreign creditors or through full repayment of external liabilities. Domestic financial market clearing then requires the aggregate asset holdings of U.S. households to equal the sum of domestic assets: the capital employed by U.S. intermediate-good producers plus the equity value of claims to their profits. Because international financial markets are fragmented, the equilibrium interest rate in the United States generally differs from the interest rate faced by the remaining 11 model economies.

We maintain the assumption that the aggregate external asset position of RoW vis-à-vis the 12-country bloc is unchanged relative to the initial integrated allocation. Since the United States is a net debtor in the initial allocation, setting its net external position to zero requires a corresponding adjustment by the remaining 11 model economies. As a result, their aggregate

net external asset position must decline. How this aggregate adjustment is distributed across the 11 countries is determined endogenously by the model and is a central object of our analysis.

In addition, because fragmentation changes equilibrium interest rates relative to the integrated allocation, capital-output ratios adjust across countries. These adjustments differ in magnitude across countries, reallocating production internationally and generating heterogeneous effects on wages. We next quantify the implications of U.S. decoupling for the international distribution of external asset positions, output, and welfare, both across and within countries.

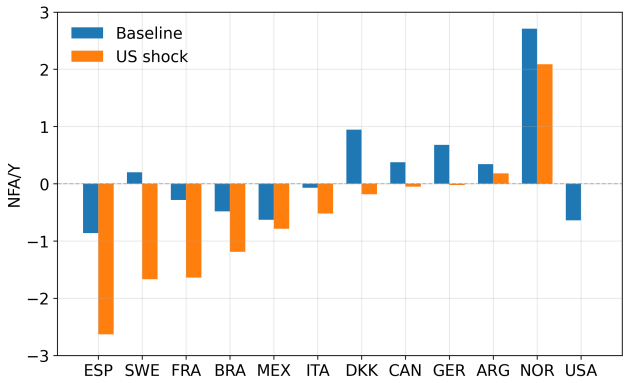
The international distribution of external asset positions. The decoupling of the United States from international financial markets is a large shock with quantitatively important implications for the rest of the world. Across the remaining 11 model economies, the average decline in net external asset positions between the initial integrated stationary allocation and the post-decoupling stationary allocation is 85 percentage points of own GDP. This adjustment reflects both the large size of the U.S. economy and the magnitude of its initial net external liability position. The adjustment is also highly heterogeneous across the non-U.S. model economies, as shown in the left panel of Figure 4. Spain experiences the largest deterioration: its net external asset position falls by 195 percentage points of GDP, more than tripling its net external liability position. Large swings toward net external debt also occur in Brazil, Denmark, France, and Sweden, and more moderate ones in Norway, Canada, and Italy, while the adjustment is comparatively muted in Germany, Mexico, and Argentina. The right panel of Figure 4 previews the associated welfare effects, which we discuss in detail below.

What explains the heterogeneous responses of individual countries to the global shock? Countries in the model differ along several dimensions, including the severity of idiosyncratic income risk, technology, preferences, capital stocks, and their initial net external asset positions. A key determinant of this heterogeneity is the combination of two country-level empirical moments that we target in our calibration of the model: income risk and total wealth, which equals the value of domestic capital, equity claims, and the net external asset position.

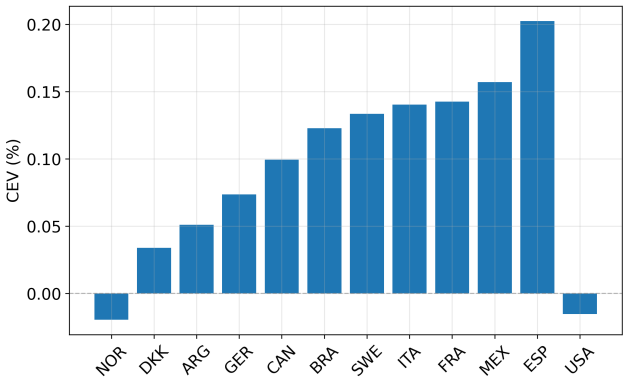
The mechanism is as follows. In a country where income risk is relatively mild, precautionary motives alone generate only limited demand for wealth accumulation. If such a country nevertheless has a high level of total wealth in the data, the calibration rationalizes this wealth through greater average patience, that is, through a higher average discount factor $\bar{\beta}_j$. Greater patience, in turn, makes desired wealth accumulation more sensitive to changes in the global interest rate. As a result, more patient countries tend to adjust their de-

Figure 4: Effects of US closure shock across countries

(a) Net foreign asset positions



(b) Aggregate welfare effects



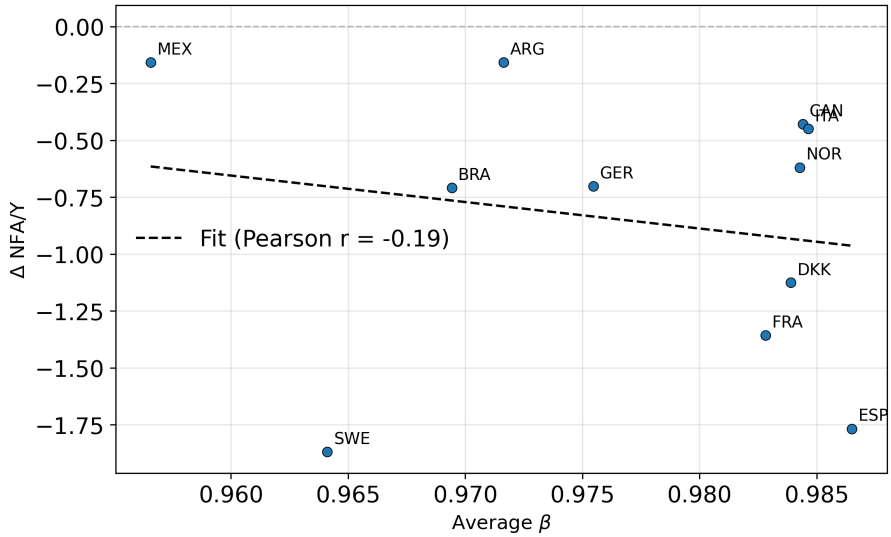
Notes: The left panel compares each country's net foreign asset position (NFA), scaled by own GDP, in the initial integrated stationary allocation ("Baseline") with its value in the stationary allocation reached after the U.S. decoupling shock ("US shock"). The right panel reports the associated change in average welfare for each country, measured as the compensating equivalent variation (CEV, in percent). The United States, whose net foreign asset position is set to zero by construction after decoupling, appears only in the right panel.

sired saving more strongly after the decoupling shock, leading to larger changes in their net external asset positions. Figure 6 shows that this relationship holds, on average, across our sample: countries with a higher average discount factor tend to experience a larger decline in their net foreign asset position (Pearson correlation of -0.40). Spain and France, which combine two of the highest average discount factors in our sample with two of the largest declines in net foreign assets, illustrate this pattern most clearly, while Mexico, the least patient country in our sample, exhibits one of the smallest adjustments. The relationship is not perfectly monotonic, however: Argentina and Germany, despite relatively high patience, adjust comparatively little, since each country's response also depends on the severity of its income risk, its initial net foreign asset position, and its capital share, which jointly shape its sensitivity to the common change in the world interest rate.

The international distribution of output. We next consider the impact of the U.S. decoupling shock on the international distribution of output. In all 11 non-U.S. model economies, output rises in the stationary allocation to which the economy converges after the shock. The key force is the decline in the world interest rate induced by the reduction in U.S. borrowing: a lower interest rate reduces the user cost of capital, induces greater capital accumulation, and raises both output and wages. This capital-deepening channel is also the mechanism through which the shock ultimately reaches welfare in the rest of the world, as we discuss below.

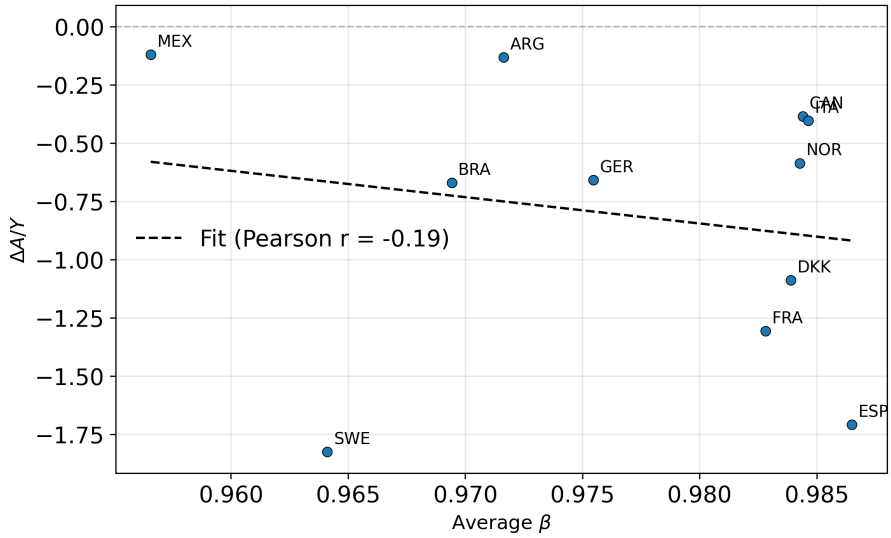
Quantitatively, the output effects of the decoupling shock are again highly heterogeneous across countries, with the largest increases observed in economies with the highest capital-

Figure 5: Average discount factor vs. change in net foreign assets after the U.S. exit shock



Notes: Each point is one of the 11 non-U.S. model economies. The horizontal axis reports each country's average discount factor $\bar{\beta}_j$; the vertical axis reports the change in the net-foreign-asset-to-GDP ratio between the initial integrated allocation and the post-decoupling stationary allocation. The dashed line is the OLS best-fit line; the reported Pearson correlation coefficient is −0.40.

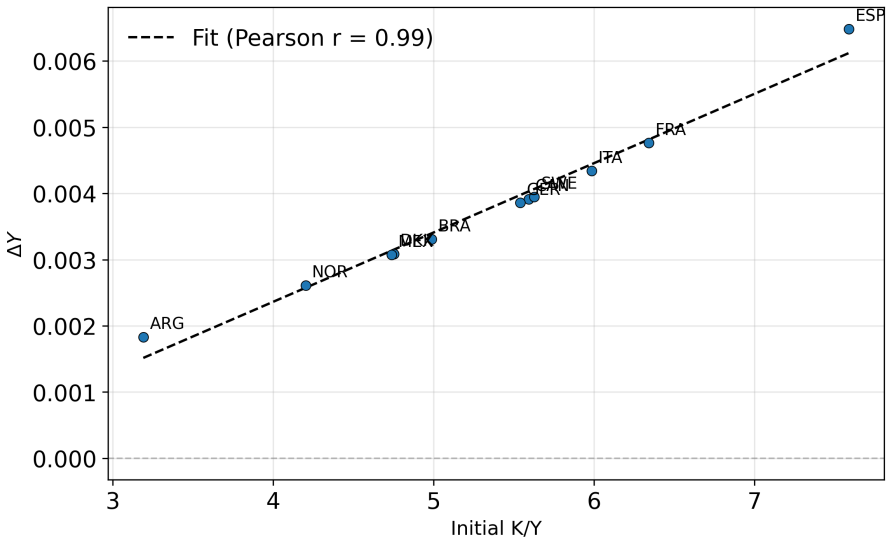
Figure 6: Average discount factor vs. change in households' wealth after the U.S. exit shock



Notes: This is for monopolistic competition, possibly to be recomputed.

output ratios in the initial allocation. Figure 7 plots the change in output between the initial integrated stationary allocation and the post-decoupling stationary allocation against the initial capital-output ratio, revealing a near-perfect relationship between the two (Pearson correlation of 0.99). Argentina, with the lowest initial capital-output ratio in our sample, experiences the smallest output gain, while Spain, with the highest initial capital-output ratio, experiences the largest. Intuitively, given a common global interest rate in the initial allocation, the calibration rationalizes high capital-output ratios through high values of the capital share α_j. Countries with higher α_j respond more strongly to the decline in the global interest rate: capital per worker rises more sharply, and output is more elastic with respect to capital. As a result, the same decline in the global interest rate generates larger output gains in high-capital-share economies.

Figure 7: Pre-shock capital-to-output ratio vs output change after the U.S. exit shock



Notes: Each point is one of the 11 non-U.S. model economies. The horizontal axis reports each country's capital-to-output ratio in the initial integrated stationary allocation; the vertical axis reports the change in output between the initial allocation and the stationary allocation reached after the U.S. decoupling shock. The dashed line is the OLS best-fit line; the reported Pearson correlation coefficient is 0.99.

Welfare effects. The U.S. decoupling shock has large and heterogeneous effects on welfare across the remaining model economies. The right panel of Figure 4 reports the change in average welfare in each country, measured as the compensating equivalent variation (CEV, in percent); positive values indicate that households are, on average, better off in the post-decoupling stationary allocation than in the initial integrated allocation, as is the case for most countries.

These welfare effects reflect two opposing forces. On one side, the reduction in U.S. borrowing lowers the aggregate stock of assets available worldwide, which is welfare-decreasing:

as in Aiyagari (1994) and Aiyagari and McGrattan (1998), households rely on asset holdings to self-insure against idiosyncratic income risk, so a smaller supply of assets erodes their ability to smooth consumption. On the other side, as described above, the decline in the world interest rate raises capital, output, and wages; the higher wage bill redistributes resources toward households at the bottom of the income distribution, which is welfare-increasing. Which of these two forces dominates is a quantitative question.

To assess their relative importance – together with a third, second-order channel arising from households' endogenous savings response – we perform a Shapley decomposition of the average CEV for each country, disentangling three distinct welfare effects of the U.S. exit shock. Figure 8 displays the results for each of the 11 non-U.S. model economies.

The first channel (Channel 1, wage income) captures the redistributive effect of changes in wages. As capital becomes more abundant following the U.S. withdrawal, firms expand production and increase labor demand, raising wages. This channel generates a welfare gain for most countries and operates analogously to the redistributive mechanism highlighted by Dávila et al. (2012) in a closed-economy setting: lower interest rates lead to higher wages, and the resulting redistribution from capital owners toward workers raises aggregate welfare when the wealth distribution is sufficiently unequal.

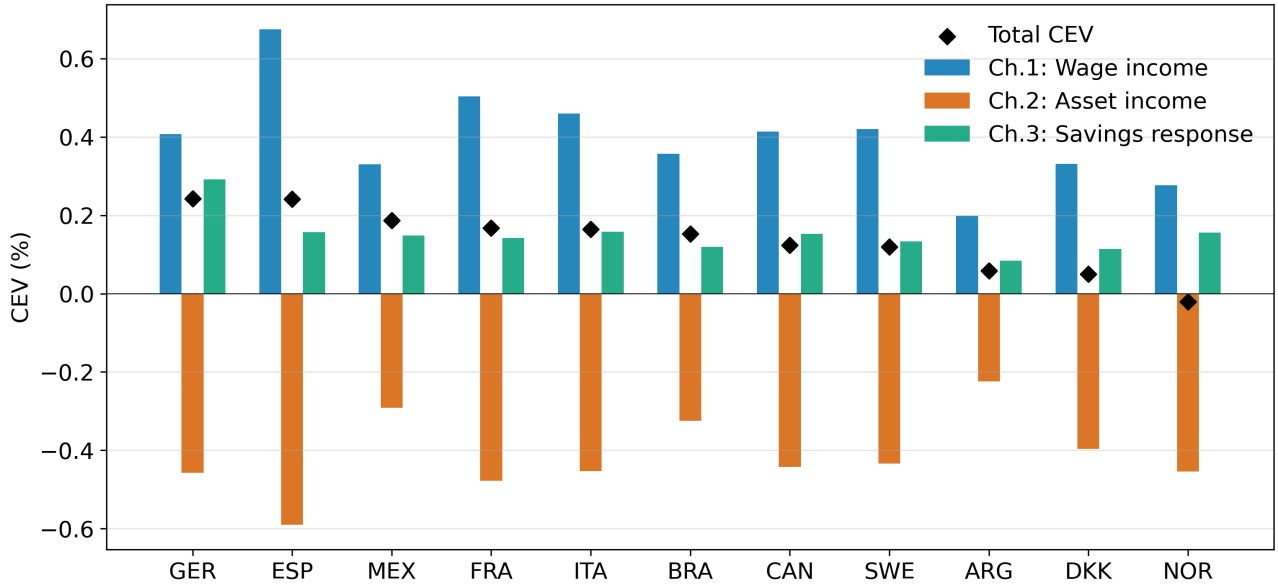
The second channel (Channel 2, asset income) captures the effect of changes in asset returns on households' ability to self-insure. As the global interest rate faced by non-U.S. economies declines, the return on precautionary savings falls, eroding the insurance value of asset holdings. This channel generates a welfare loss in all countries, in the spirit of Aiyagari (1994) and Aiyagari and McGrattan (1998): a lower interest rate reduces the capacity of incomplete markets to absorb idiosyncratic risk, as households must save more to achieve a given level of insurance.

The third channel (Channel 3, savings response) captures the endogenous adjustment of households' savings behavior in response to the new interest-rate environment. As the real return to saving changes, households reoptimize their portfolio allocations, inducing second-order welfare effects through a reallocation of resources toward productive investment. This channel is positive in most countries, reflecting the greater capital deepening and output that result from the decline in the cost of borrowing.

As shown in Figure 8, the total CEV (diamonds) is positive for all countries in our sample except Norway, where the negative asset-income effect slightly dominates. For most countries, the wage-income and savings-response channels together more than offset the insurance losses from lower asset returns, yielding positive average welfare effects from the U.S. exit shock.

These aggregate effects mask substantial heterogeneity within countries. Because the shock moves factor prices in opposite directions – raising wages while lowering the return

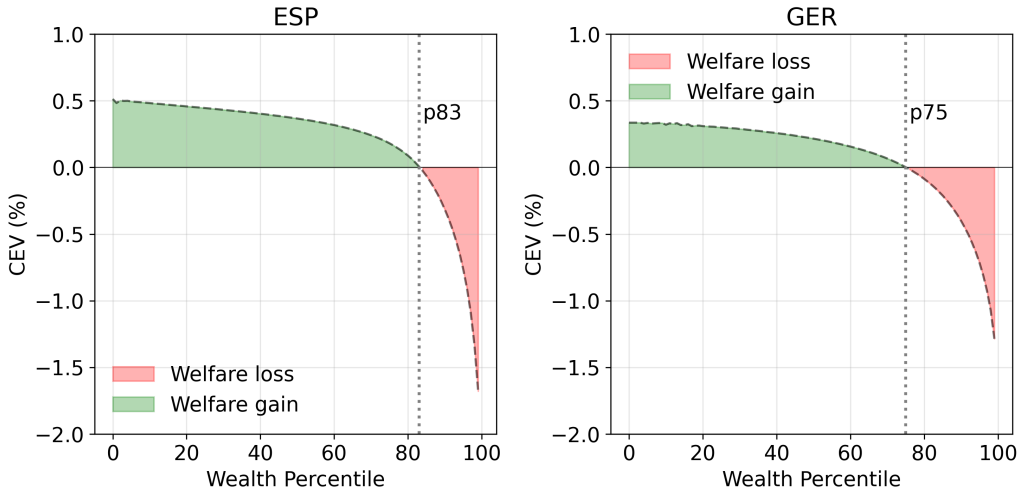
Figure 8: Shapley decomposition of welfare effects of the U.S. exit shock



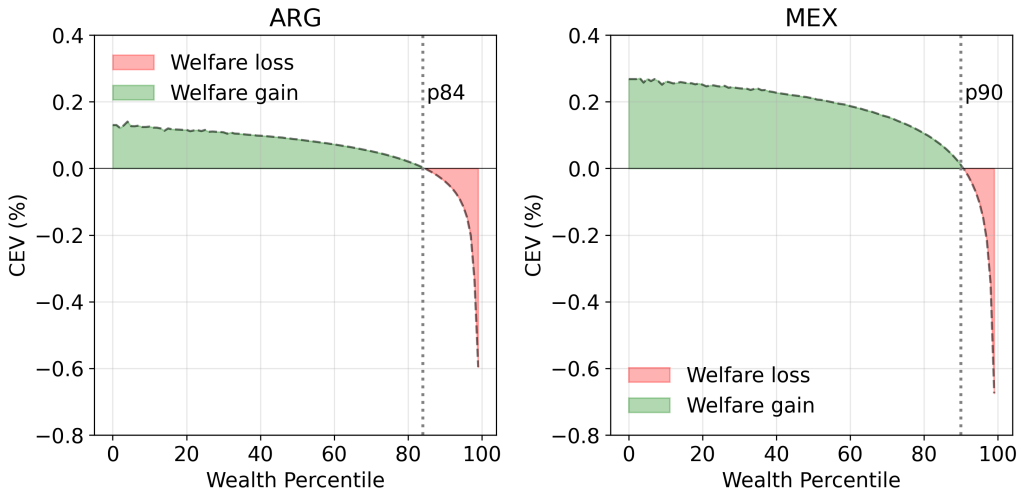
Notes: Each bar decomposes the average compensating equivalent variation (CEV) into three channels via a Shapley decomposition. Channel 1 (blue): wage-income effect, capturing the welfare impact of changes in wages. Channel 2 (orange): asset-income effect, capturing changes in the return to precautionary savings and the resulting effect on self-insurance capacity. Channel 3 (green): savings-response effect, capturing welfare gains from the endogenous reallocation of household savings toward productive capital. Diamonds denote the total CEV. A positive CEV indicates that households in that country are, on average, better off in the post-shock stationary allocation than in the integrated benchmark.

on wealth – its welfare incidence depends on households' factor-income composition: households whose consumption is financed primarily by labor income benefit from higher wages, whereas wealthier households, more exposed to the decline in asset returns, gain less or lose. The strength of this channel varies across countries, because the increase in capital intensity, and hence the wage response, differs across economies. Figure 9 displays the resulting distribution of welfare effects across households, separately for advanced and emerging economies.

Figure 9: Within-country distribution of welfare effects under the U.S. decoupling shock



(a) Welfare of households in advanced economies



(b) Welfare of households in emerging economies

4.2 China Decoupling Scenario

The second financial-fragmentation scenario is a China decoupling shock, in which China – together with other major net-lender economies – ceases lending to the 12-country bloc. In the new stationary allocation, the external asset position of the rest of the world therefore falls to zero, $NFA^{RoW} = 0$. Since RoW is a net creditor vis-à-vis the bloc in the initial integrated allocation, this shock forces the 12 countries in our sample to achieve aggregate external balance on their own, without recourse to foreign credit. Countries in our sample are thus forced to save more.

In contrast to the U.S.-decoupling shock, the contraction in the global supply of credit raises, rather than lowers, the interest rate faced by the 12-country bloc. For the United States, the implications of this shock are therefore similar to those already discussed in the previous exercise: as in the U.S.-decoupling scenario, the U.S. faces a higher interest rate, and the same forces operate on capital accumulation, wages, and welfare. For the remaining 11 countries, the mechanism is similar in spirit to the U.S.-decoupling exercise, but with the opposite sign: whereas the contraction in U.S. borrowing made capital more abundant and raised wages and output abroad, the withdrawal of Chinese lending makes capital scarcer everywhere, lowering capital-output ratios, output, and wages in these economies.

Because the economic forces at work mirror those already described for the U.S.-decoupling shock, operating in the opposite direction, we keep the discussion of this scenario more concise, focusing on the main quantitative differences relative to the U.S. exercise. As before, we first characterize the new stationary allocation, and we then turn to the transition dynamics between the initial and post-decoupling allocations.

China-Decoupling Stationary Allocation We now turn to the steady-state comparison under China's decoupling. Figure 10 shows that, in the new stationary allocation, all 12 countries in our sample save more. The resulting change in net foreign asset positions is less pronounced than in the U.S.-decoupling exercise. This is because, here, the U.S. net foreign asset position is free to respond endogenously to the shock, whereas in the U.S.-decoupling exercise we held the Rest-of-World net foreign asset position fixed and forced the entire adjustment onto the remaining 11 countries. Since the United States is itself one of the 12 countries – and, given the sheer size of its economy, a large absorber – its own position now takes on a substantial share of the required rebalancing, dampening the response of the other 11. The countries that adjust their net foreign asset position the most are the same ones that were most reactive in the U.S.-decoupling exercise, since the same calibration channel – the joint targeting of income risk and total wealth via the discount factor $\bar{\beta}_j$ (see above) – governs the sensitivity of desired savings to the interest rate in both exercises.

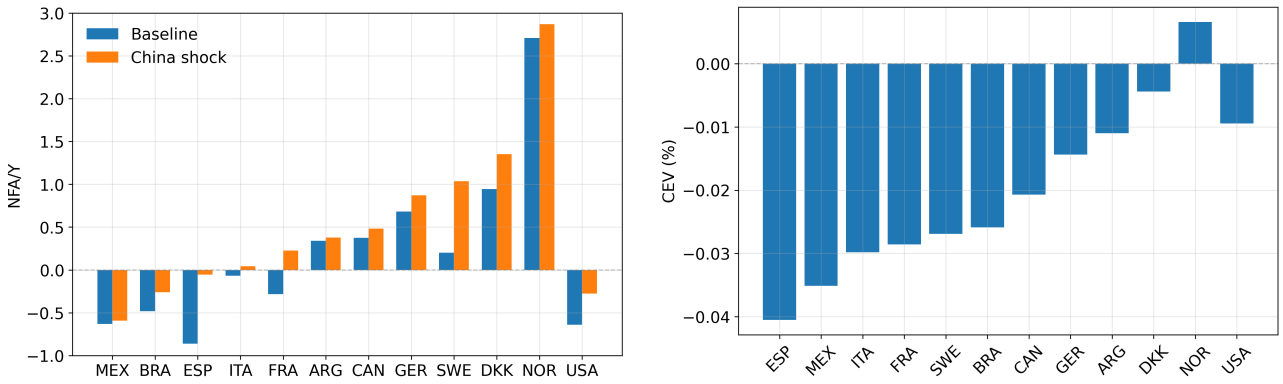
Unlike the U.S.-decoupling shock, the China shock lowers aggregate welfare in all countries but Norway. As China's exit reduces the global supply of loanable funds, the interest rate rises, making it costlier for firms to rent capital; firms respond by producing less and demanding less labour. Wages fall, and the shock redistributes resources from workers toward capital owners – a welfare-decreasing outcome given the concentration of wealth. In terms of the Shapley decomposition introduced for the U.S. exercise, the loss is driven mainly by the wage-income and savings-response channels, which here operate with the opposite sign; Figure 11 reports the decomposition. Norway is the exception: as the country with by far the largest external asset position, it is the most exposed to the asset-income channel, which turns positive when the world interest rate rises, and this gain outweighs its wage-income loss – the mirror image of Norway's outlier welfare *loss* under the U.S.-decoupling shock.

This welfare result depends on capital and financial assets being close substitutes in household portfolios, so that the higher interest rate maps into lower capital, output, and wages. If this assumption is relaxed – for instance if part of household savings is held in non-productive assets, or if production is modeled as an endowment economy with no capital margin – the wage channel is muted. In that case the dominant force is the asset-income channel: with China saving less, the higher interest rate strengthens households' ability to self-insure and improves risk sharing within the 12-country bloc, in the spirit of Aiyagari (1994) and Aiyagari and McGrattan (1998), so that the shock can instead be welfare-increasing.

Figure 10: Effects of China closure shock across countries

(a) Net foreign asset positions

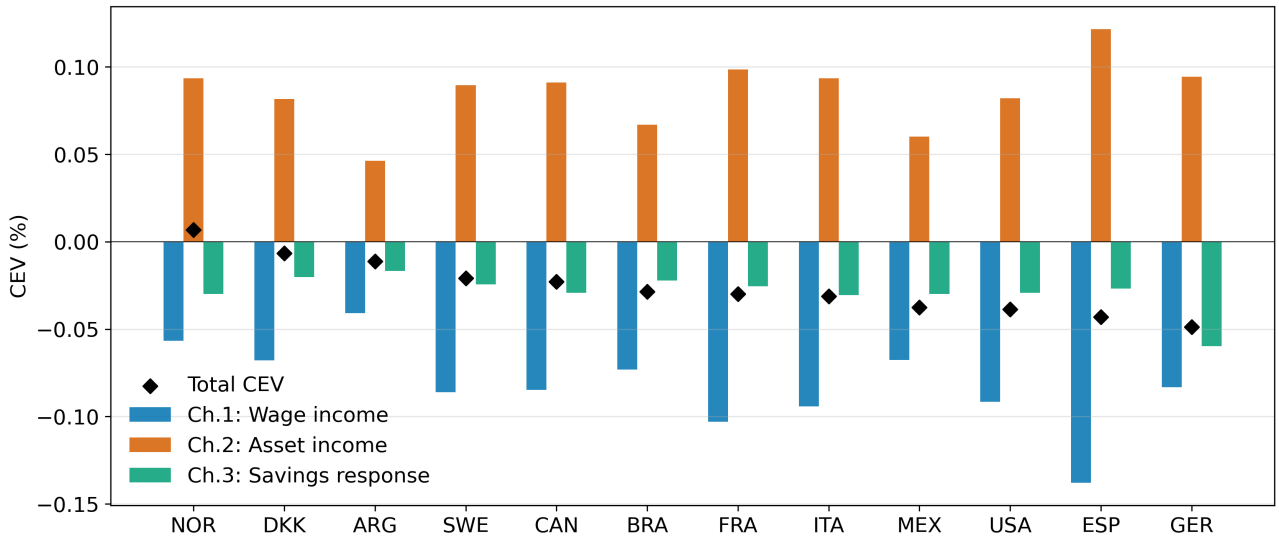
(b) Aggregate welfare effects



Notes: The left panel compares each country's net foreign asset position (NFA), scaled by own GDP, in the initial integrated stationary allocation ("Baseline") with its value in the stationary allocation reached after the China decoupling shock ("China shock"). The right panel reports the associated change in average welfare for each country, measured as the compensating equivalent variation (CEV, in percent). Unlike the U.S. decoupling shock, all 12 countries appear in both panels.

In the steady state, aggregate welfare declines for most countries. Within countries, however, the effects are heterogeneous: households that are relatively rich in capital tend to gain, whereas households that are relatively rich in labour tend to lose. We discuss these results

Figure 11: Shapley decomposition of welfare effects of the China decoupling shock.



Notes: Each bar decomposes the average compensating equivalent variation (CEV) into three channels via a Shapley decomposition. Channel 1 (blue): wage-income effect. Channel 2 (orange): asset-income effect, capturing changes in the return to precautionary savings and the resulting effect on self-insurance capacity. Channel 3 (green): savings-response effect. Diamonds denote the total CEV. A positive CEV indicates that households in that country are, on average, better off in the post-shock stationary allocation than in the integrated benchmark.

in detail below.

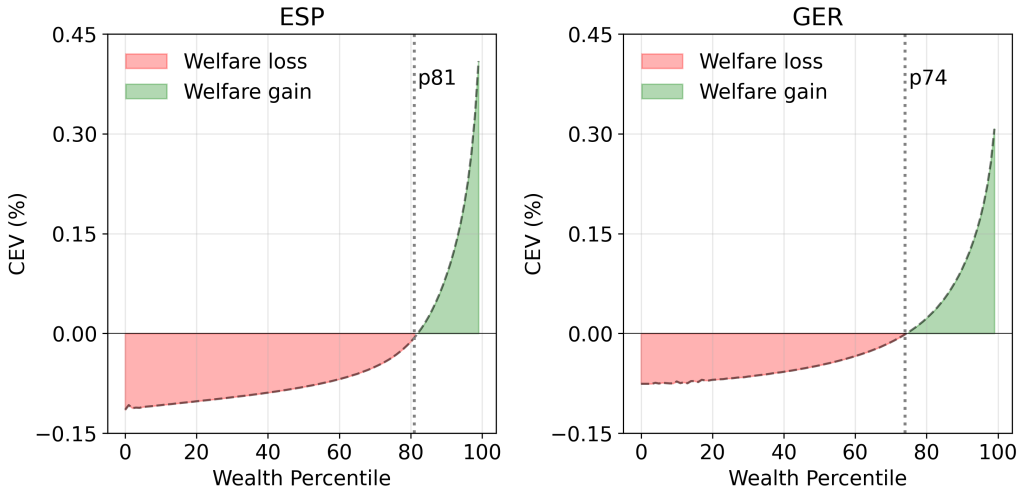
At the aggregate level, welfare falls in all countries except the United States, as shown in the right panel of Figure 4b. The magnitude of the welfare change is heterogeneous and depends primarily on the parameters governing capital intensity, α_i. This relationship is illustrated in Figure 13. A useful proxy for aggregate welfare is aggregate consumption, defined as

$$C = Y(r) + B(r), r. \tag{28}$$

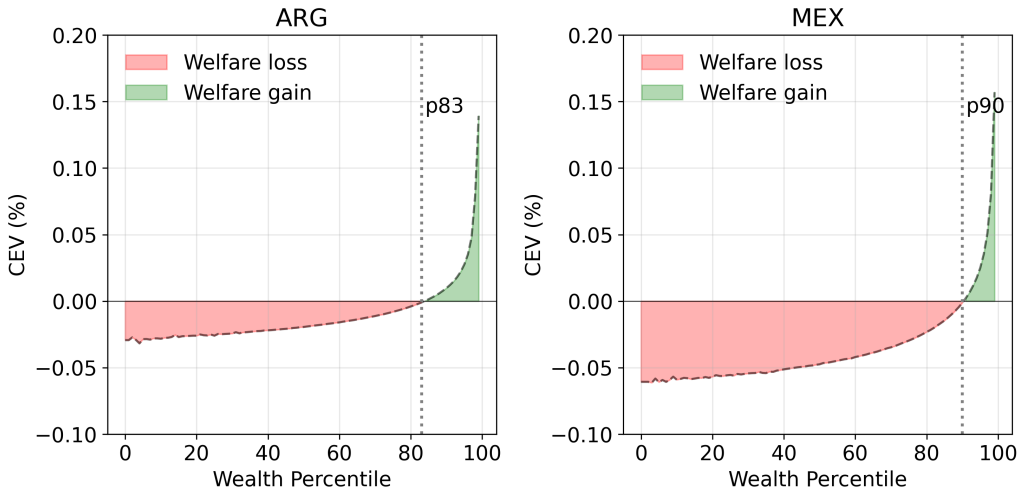
Changes in the interest rate affect aggregate consumption through three main channels. First, there is a direct effect: debtor countries benefit from higher interest rates, whereas creditor (saver) countries benefit from lower rates. Second, the interest rate influences the initial level of wealth. In particular, a decline in the interest rate reduces the return on existing assets and thus lowers initial wealth. Third, the interest rate affects production. A lower interest rate reduces the cost of capital, encouraging firms to increase capital demand, hire more labour, and expand output. The strength of this channel depends on α_i. For countries with a low capital share (i.e., α_i close to zero), firms production responds only weakly to changes in the interest rate. Overall, the production effect appears to dominate the direct interest rate and wealth effects.

Finally, the shock has heterogeneous effects across households, as shown in Figures 14a

Figure 12: Within-country distribution of welfare effects under the China decoupling shock



(a) Welfare of households in advanced economies



(b) Welfare of households in emerging economies

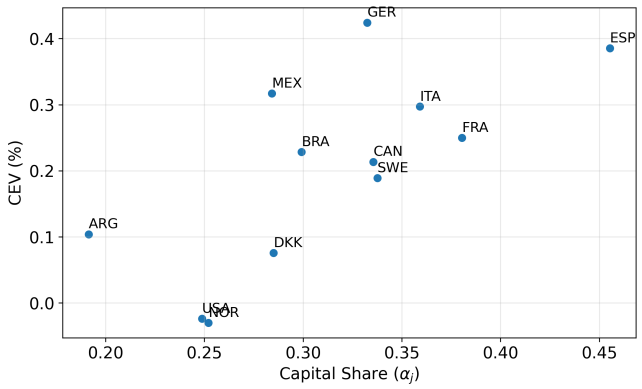
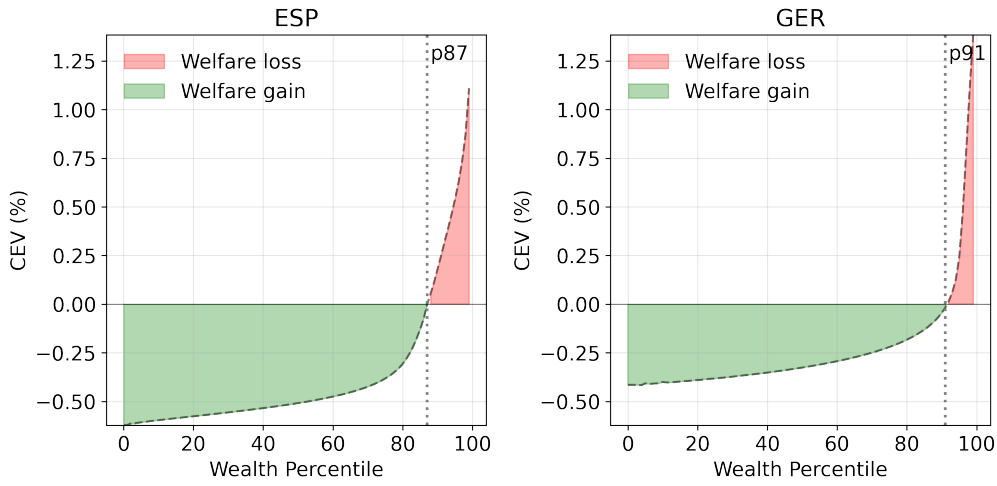


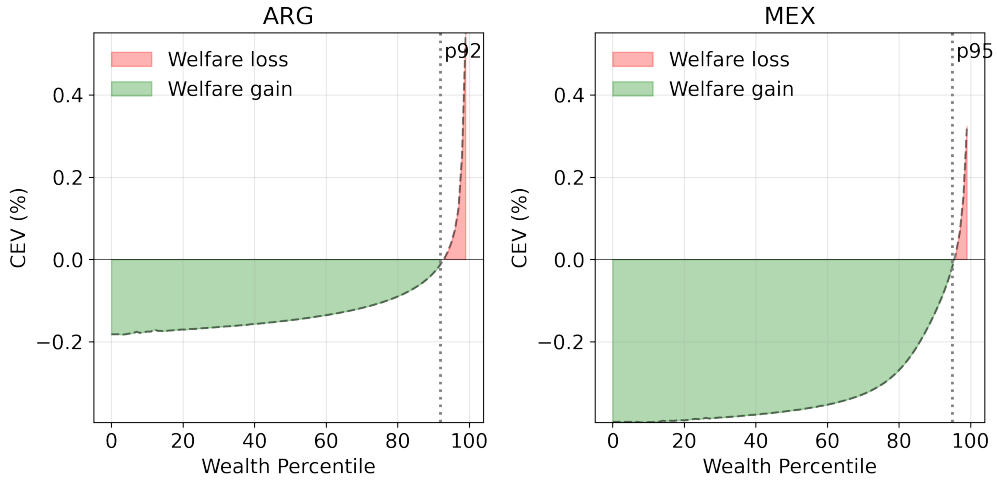
Figure 13: Welfare: alpha vs CEV after US exit

and 14b. As firms expand production, they increase labour demand, which puts upward pressure on wages. Consequently, households that are relatively rich in labour but poor in capital benefit from higher wages. In contrast, wealthier households experience welfare losses due to the decline in the return to capital following the U.S. closure.

Figure 14: Effects of US closure shock across countries



(a) Welfare of households in advanced economies



(b) Welfare of households in emerging economies

4.3 Transition

[DISCUSSION: Numbers to be checked throughtout against updated figures]

The steady-state comparisons above contrast the initial and final stationary allocations but are silent on the path between them. Even if external asset positions were to adjust im-

mediately, the world economy would take time to converge to the new stationary allocation, because the within-country distributions of wealth adjust only gradually from their initial to their final configurations. In practice, moreover, the rebalancing of external positions is itself unlikely to occur all at once. We therefore study the dynamic transition explicitly: we impose alternative paths for the adjustment of aggregate external asset positions and trace how their speed and shape drive the dynamics of the world interest rate and, through it, the welfare consequences of decoupling – which, as we show, can differ substantially from what the steady-state comparison alone would suggest. We do so for both the U.S. and the China decoupling scenarios.

Deleveraging paths. We consider four alternative paths for the adjustment of aggregate external asset positions: (i) an *immediate* adjustment that completes in a single period; (ii) a *front-loaded* path that concentrates the adjustment in the early years; (iii) a *linear* path that spreads it evenly over 20 years; and (iv) a *back-loaded* path that defers most of the adjustment to later years. In the U.S.-decoupling scenario, each path is implemented through a time-varying tax on U.S. residents' foreign borrowing that induces the desired trajectory for the U.S. net foreign asset position. In the China-decoupling scenario, we do not model the rest of the world explicitly; we therefore let the aggregate external asset position of the 12-country bloc – held constant across the initial and final stationary allocations – follow one of the four paths above as it closes toward $NFA^{RoW} = 0$.

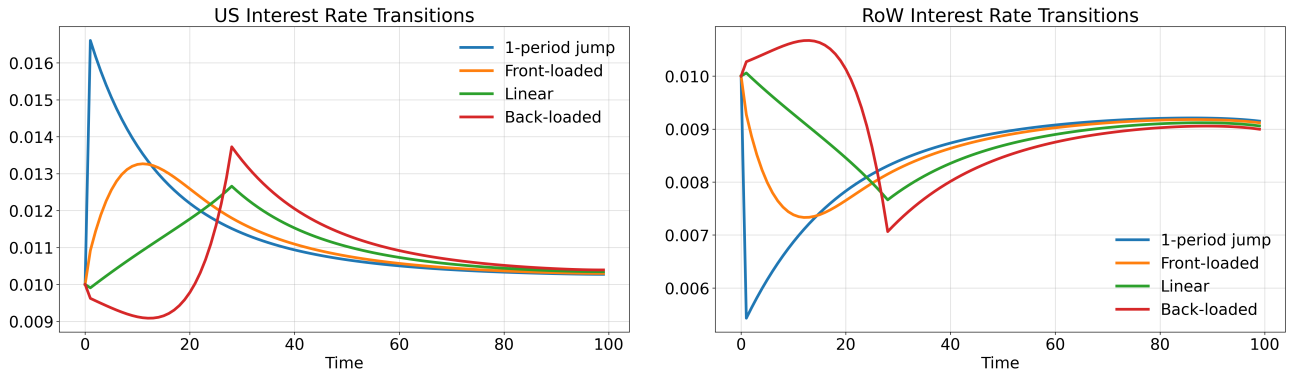
Interest rate dynamics. We display the transition paths of the equilibrium interest rate under the U.S. and the China decoupling shocks in Figures 15 and 16, respectively.

Consider first the U.S.-decoupling scenario, in Figure 15, which reports the interest rate faced by the United States (left panel) and by the remaining 11 economies (right panel). As in the steady-state comparison, decoupling raises the U.S. interest rate and lowers the rate faced by the rest of the bloc; the transition, however, features pronounced overshooting whose timing tracks the deleveraging path. The overshooting is starkest under the immediate adjustment. On impact, households in the remaining 11 economies collectively hold a large stock of external wealth, but must reduce it to the new, much lower target within a single period; inducing this sharp dissaving requires the interest rate to collapse on impact – to around 0.5%, well below both its initial level (%) and its new long-run level ($\approx 0.9\%$). From the second period onward, external positions are already at their new values, but capital stocks and wealth distributions still have to converge: the low initial interest rate spurs a wave of capital installation, so output booms on impact and then declines toward its new stationary level (which lies above the old one), while the abundant capital keeps the return low, and the interest rate converges to its new stationary value from below. The U.S. rate

spikes upward correspondingly, as U.S. households must absorb their economy's entire asset supply at once. The intuition is similar under the other three paths, but the paths are smoother and future adjustments are anticipated: the front-loaded path reaches its trough after about a decade, the linear path adjusts smoothly over the 20-year window, and under the back-loaded path anticipation effects initially push the rest-of-bloc rate slightly *above* its initial level – the opposite direction of its long-run adjustment – for roughly two decades before the bulk of the deleveraging occurs and the rate falls sharply.

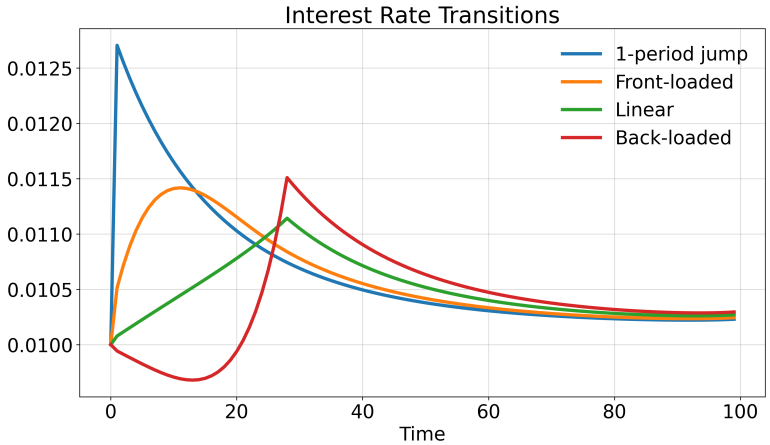
Figure 15: Interest rate dynamics under the U.S. decoupling shock

(a) United States (b) Rest of the 12-country bloc



Notes: Each panel plots the transition path of the equilibrium interest rate under the four alternative deleveraging paths for the U.S. net foreign asset position. The left panel reports the U.S. interest rate; the right panel reports the interest rate faced by the remaining 11 economies.

Figure 16: Interest rate dynamics under the China decoupling shock

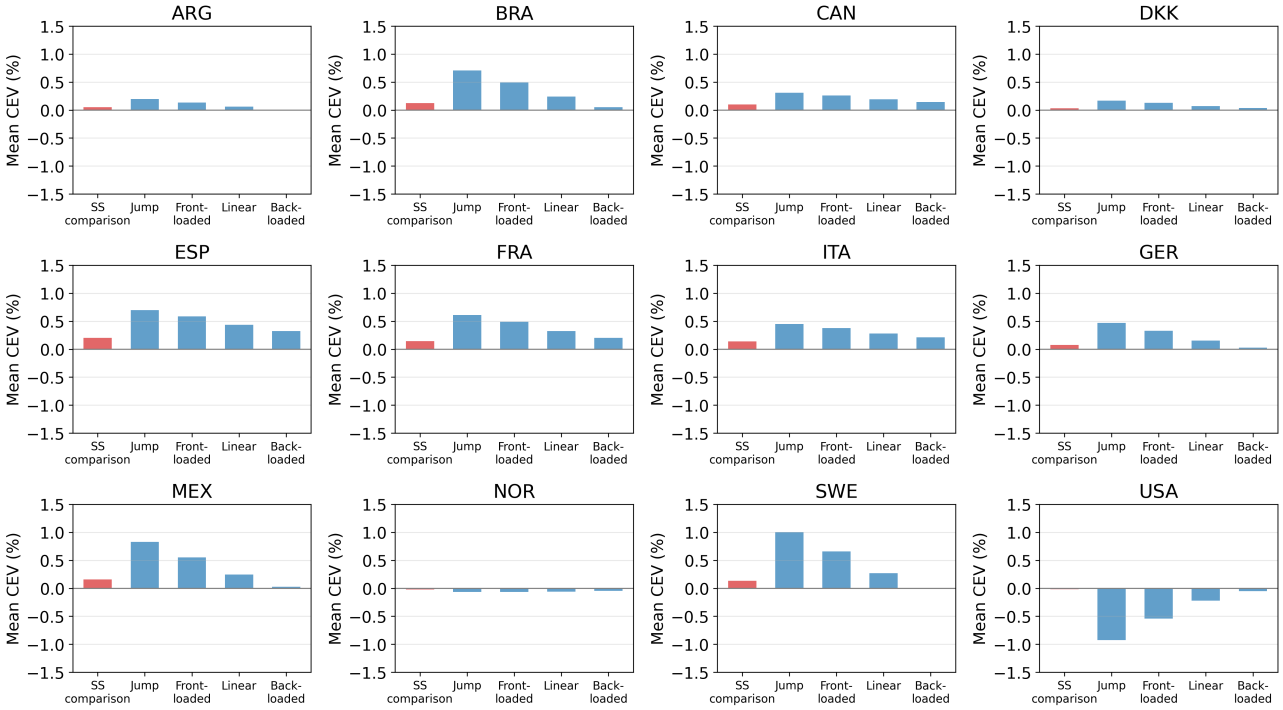


Notes: The figure plots the transition path of the bloc-wide equilibrium interest rate under the four alternative paths for the aggregate external asset position of the 12-country bloc.

U.S. decoupling: Welfare along the transition. The transition path has a first-order impact on welfare, both in the aggregate and in its distribution within countries. Figure 17 reports

the average (mean) CEV for each country under the four deleveraging paths, alongside the steady-state comparison. For the 11 non-U.S. economies, the transition delivers positive average welfare gains that are generally *larger* than the steady-state comparison would suggest, and that are largest under the immediate adjustment and smallest under the back-loaded path – turning marginally negative for Brazil and Mexico. The intuition follows the interest-rate dynamics: a faster adjustment front-loads the decline in the rest-of-bloc rate, generating an early and large boost to wages and capital deepening that benefits the mass of labor-rich households. The United States, by contrast, loses on average under every transition path, with the largest loss ($\approx -1\%$) under the immediate adjustment.

Figure 17: Average welfare effects across countries by transition path: U.S. decoupling

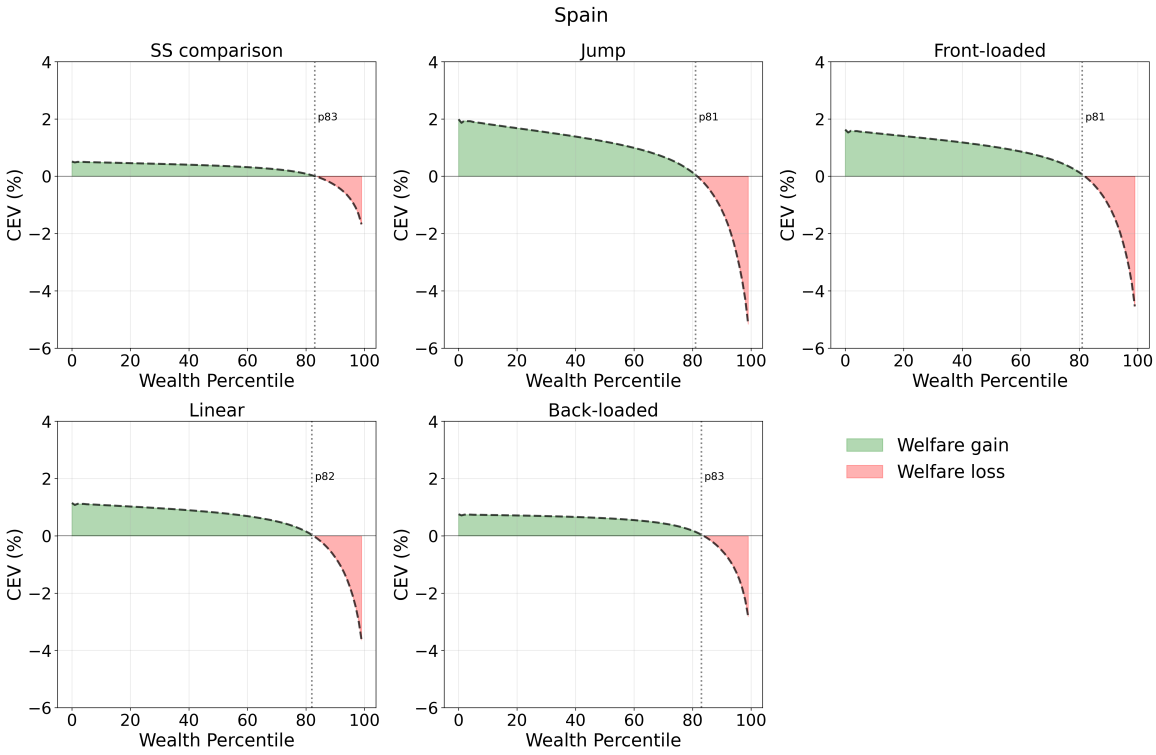


Notes: Each panel reports the average (mean) consumption equivalent variation (CEV, in percent; positive values indicate welfare gains) for a given country under the steady-state comparison and the four alternative deleveraging paths.

Figure 18 illustrates the within-country incidence of the shock for Spain. The transition amplifies the heterogeneity of the welfare effects of the shock, relative to the steady-state comparison. Households below roughly the 82nd wealth percentile gain, as higher wages raise their labor income, and they gain most under the immediate path (up to $\approx$ +2% at the bottom of the distribution). Households above that threshold lose, as the decline in the interest rate erodes the return on their wealth, and they too fare worst under the immediate path (losing $\approx 5.5\%$ at the top percentile) and best under the back-loaded path. The crossover between winners and losers sits at around the 82nd–83rd wealth percentile across all paths.

Thus the speed of adjustment matters independently of the final stationary allocation: a faster adjustment raises average welfare in the rest of the bloc but concentrates sharply larger losses on the wealthiest households, whereas a back-loaded adjustment delivers the most even – but also the smallest – average gains.

Figure 18: Welfare distribution within Spain by transition path: U.S. decoupling

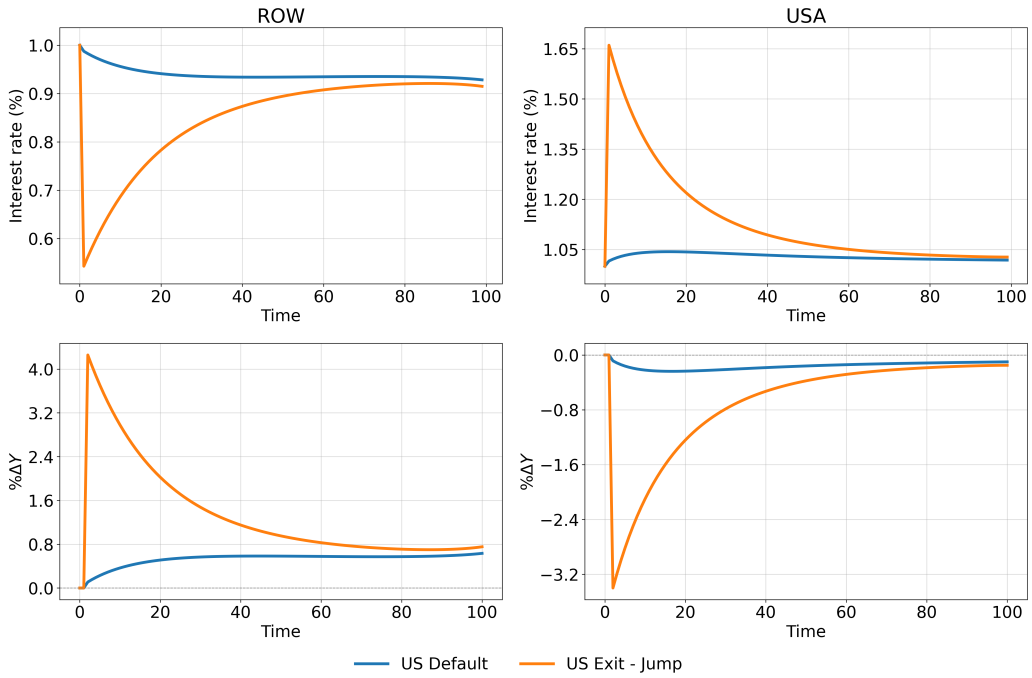


Notes: Each panel shows the CEV across households in Spain, sorted by wealth percentile, under the steady-state comparison and the four alternative deleveraging paths. Green (red) shading denotes welfare gains (losses); the dotted line marks the wealth percentile at which the CEV crosses zero.

U.S. Default We now consider an alternative scenario in which the United States defaults on its external liabilities rather than closing its net foreign asset position through voluntary deleveraging. We compare this scenario to the one-period ("jump") path, as the two scenarios imply the closest paths for the U.S. net foreign asset position and are therefore the natural counterfactual pair. Under default, we assume that all savers in the rest of the bloc take a hit on their holdings of U.S. assets, so that the rest-of-bloc's wealth falls on impact together with the U.S. net foreign asset position.

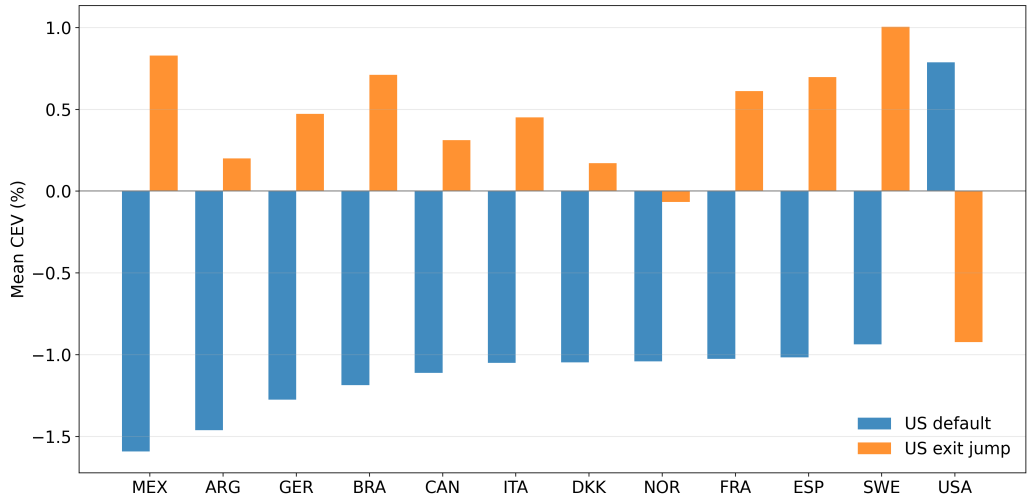
As Figure 19 shows, unlike under the jump scenario, default does not trigger a boom in output and consumption in the rest of the bloc. Because the default destroys the rest of the bloc's wealth directly – rather than simply curtailing its ability to lend to the United States – households there do not benefit from any additional borrowing capacity. As before, the decline in the interest rate still leads households in the rest of the bloc to raise their desired

Figure 19: Interest rate and output dynamics under U.S. default vs. the one-period deleveraging path



Notes: Each panel compares the transition path following a U.S. default (blue) to the one-period ("jump") deleveraging path (orange). The top panels report the equilibrium interest rate for the rest of the bloc (left) and for the United States (right); the bottom panels report the corresponding percentage change in output, $\%\Delta Y$, relative to the initial steady state.

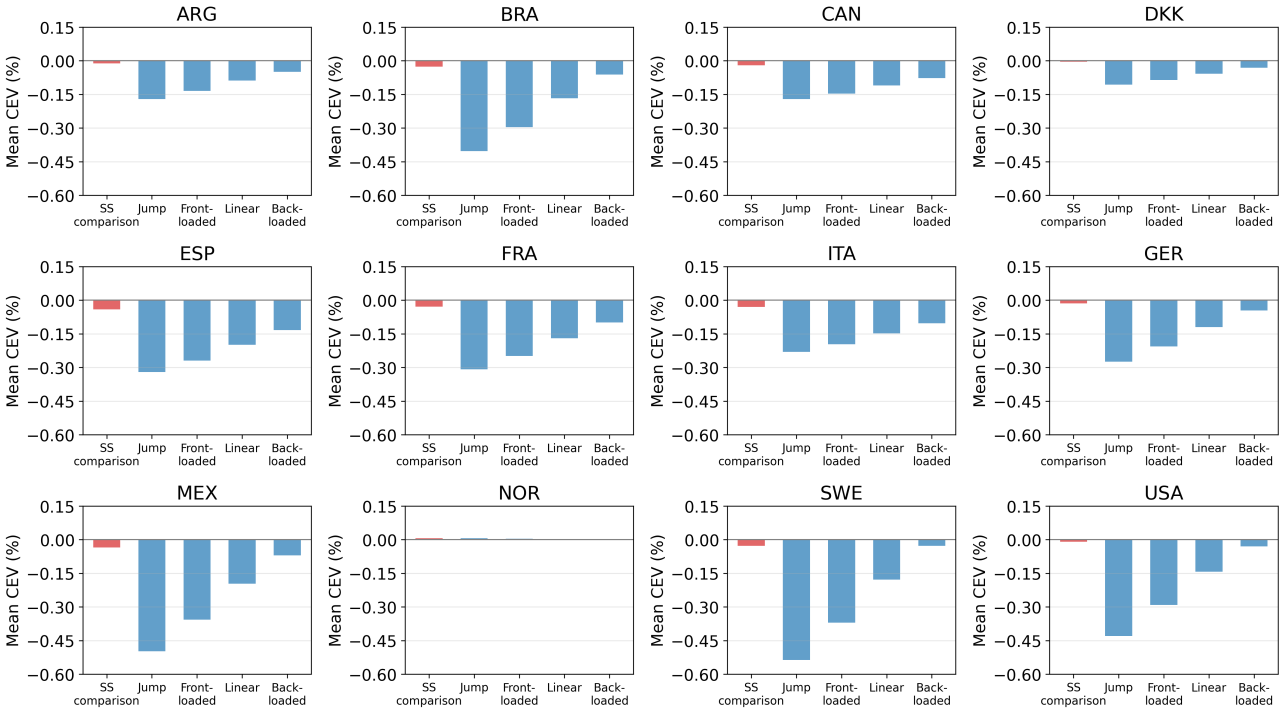
Figure 20: Average welfare effects of U.S. default vs. the one-period deleveraging ("jump") scenario, by country



Notes: Each bar reports the average (mean) consumption equivalent variation (CEV, in percent) for a given country under the U.S. default scenario (blue) and under the one-period deleveraging ("jump") scenario (orange).

capital holdings, prompting firms to invest more; output and wages therefore still rise over time, but only gradually and by much less than under the jump. Figure 20 confirms this: mean consumption-equivalent welfare in the rest of the bloc is substantially lower under default than under the jump, turning negative for every country except Norway. The default is thus, on net, a positive shock for the United States – which benefits from writing off its external debt – but a markedly negative shock for the rest of the bloc, the opposite of the pattern under the jump scenario, where the United States loses and the rest of the bloc gains.

Figure 21: Average welfare effects across countries by transition path: China decoupling



Notes: Each panel reports the average (mean) consumption equivalent variation (CEV, in percent; positive values indicate welfare gains) for a given country under the steady-state comparison and the four alternative paths for the aggregate external asset position of the 12-country bloc.

China decoupling: Welfare along the transition. The welfare effects of the China-decoupling transition mirror those of the U.S.-decoupling transition: average welfare now falls in every country, and the speed of adjustment amplifies the losses rather than the gains. As Figure 21 shows, countries lose most under the immediate path – Mexico loses $\approx$ 0.5%, and Brazil, Germany, and the United States around 0.3–0.4% – and least under the back-loaded path, with the losses generally exceeding those implied by the steady-state comparison. The losses are, however, smaller in absolute value than the corresponding gains under the U.S.-decoupling shock, in line with the steady-state results: since the United States is itself part of the 12-country bloc, its large economy absorbs a substantial share of the required rebal-

ancing, dampening the movement in the interest rate and hence the welfare effects for the remaining countries. Norway, whose external asset position is by far the largest, is again the near-exception and remains essentially unaffected. Within countries, the higher interest rate redistributes from workers, who face lower wages, toward wealthy households, who earn higher returns – reversing the incidence of the U.S.-decoupling shock – with the same amplification by the speed of adjustment.

5 Concluding Remarks

This paper develops a quantitative framework to analyze the welfare consequences of financial fragmentation in a world where countries differ systematically in both the nature of household income risk and the distribution of wealth. Our framework makes two key contributions. First, we document substantial cross-country heterogeneity in higher-order moments of income risk and show that accurately capturing these non-Gaussian features of income dynamics is crucial for understanding patterns of wealth inequality. Second, we use this framework to quantify the aggregate and distributional effects of financial fragmentation both across and within countries.

We find that the welfare implications of financial fragmentation depend crucially on countries' initial external positions and domestic wealth distributions. In the United States, financial autarky benefits only households at the top of the wealth distribution, while imposing substantial costs on the majority of households through lower wages. The effects are reversed in creditor nations, where autarky generates gains for workers but losses for wealthy capital owners. When we consider a broader sudden stop in lending to the entire bloc, the welfare losses are concentrated in countries with larger initial borrowing and fall disproportionately on workers rather than capital owners.

These findings suggest that debates about financial fragmentation must consider not only the aggregate implications for capital allocation but also the substantial redistributive effects both across and within countries.

References

Aiyagari, S. Rao. 1994. "Uninsured Idiosyncratic Risk and Aggregate Saving." *The Quarterly Journal of Economics*, 109(3): 659–684.

Aiyagari, S. Rao, and Ellen R. McGrattan. 1998. "The Optimum Quantity of Debt." *Journal of Monetary Economics*, 42(3): 447–469.

Atkeson, Andrew, Jonathan Heathcote, and Fabrizio Perri. 2025. "Reconciling Macroeconomics and Finance for the U.S. Corporate Sector: 1929 to Present." Federal Reserve Bank of Minneapolis Staff Report. Preliminary draft.

Auclert, Adrien, Hannes Malmberg, Frederic Martenet, and Matthew Rognlie. 2021. "Demographics, Wealth, and Global Imbalances in the Twenty-First Century." *NBER Working Paper*, , (29161).

Bewley, Truman F. 1986. *Stationary Monetary Equilibrium with a Continuum of Independently Fluctuating Consumers.* Yale University Press.

Caldara, Dario, and Matteo Iacoviello. 2022. "Measuring Geopolitical Risk." *American Economic Review*, 112(4): 1194–1225.

Carroll, Christopher, Jiri Slacalek, Kiichi Tokuoka, and Matthew N White. 2017. "The distribution of wealth and the marginal propensity to consume." *Quantitative Economics*, 8(3): 977–1020.

Castañeda, Ana, Javier Díaz-Giménez, and José-Víctor Ríos-Rull. 2003. "Accounting for the US earnings and wealth inequality." *Journal of Political Economy*, 111(4): 818–857.

Civale, Simone, Luis Díez-Catalán, and Fatih Fazilet. 2017. "Discretizing a Process with Non-zero Skewness and High Kurtosis." mimeo.

Clayton, Christopher, Matteo Maggiori, and Jesse Schreger. 2023. "A Framework for Geoeconomics." *NBER Working Paper No. 31852*.

Clayton, Christopher, Matteo Maggiori, and Jesse Schreger. 2024. "A Theory of Economic Coercion and Fragmentation." *BIS Working Paper No. 1224*.

Cooley, Thomas F., and Edward C. Prescott. 1995. "Economic Growth and Business Cycles." In *Frontiers of Business Cycle Research.* , ed. Thomas F. Cooley, 1–38. Princeton, NJ:Princeton University Press.

Dávila, Julio, Jay H. Hong, Per Krusell, and José-Víctor Ríos-Rull. 2012. "Constrained Efficiency in the Neoclassical Growth Model with Uninsurable Idiosyncratic Shocks." *Econometrica*, 80(6): 2431–2467.

de Ferra, Sergio, Kurt Mitman, and Federica Romei. 2020. "Household heterogeneity and the transmission of foreign shocks." *Journal of International Economics*, 124: 103303. NBER International Seminar on Macroeconomics 2019.

de Ferra, Sergio, Kurt Mitman, and Federica Romei. 2021. "Why Does Capital Flow from Equal to Unequal Countries?" CEPR Press Discussion Paper 15647, Paris & London.

Del Negro, Marco, Domenico Giannone, Marc P. Giannoni, and Andrea Tambalotti. 2019. "Global Trends in Interest Rates." *Journal of International Economics*, 118: 248–262.

Feenstra, Robert C., Robert Inklaar, and Marcel P. Timmer. 2015. "The Next Generation of the Penn World Table." *American Economic Review*, 105(10): 3150–3182.

Gomme, Paul, and Peter Rupert. 2007. "Theory, Measurement and Calibration of Macroeconomic Models." *Journal of Monetary Economics*, 54(2): 460–497.

Guvenen, Fatih, Fatih Karahan, Serdar Ozkan, and Jae Song. 2021. "What Do Data on Millions of U.S. Workers Say About Labor Income Risk?" *Econometrica*, 89(5): 2303–2339.

Guvenen, Fatih, Luigi Pistaferri, and Giovanni L. Violante. 2022. "Global trends in income inequality and income dynamics: New insights from GRID." *Quantitative Economics*, 13(4): 1321–1360.

Holston, Kathryn, Thomas Laubach, and John C. Williams. 2017. "Measuring the Natural Rate of Interest: International Trends and Determinants." *Journal of International Economics*, 108(S1): S59–S75.

Imrohoroglu, Ayse. 1989. "Cost of Business Cycles with Indivisibilities and Liquidity Constraints." *Journal of Political Economy*, 97(6): 1364–1383.

Krueger, Dirk, Kurt Mitman, and Fabrizio Perri. 2016. "Macroeconomics and Household Heterogeneity." *Handbook of Macroeconomics*, 2: 843–921.

Krusell, Per, and Anthony A Smith. 1998. "Income and Wealth Heterogeneity in the Macroeconomy." *Journal of Political Economy*, 106(5): 867–896.

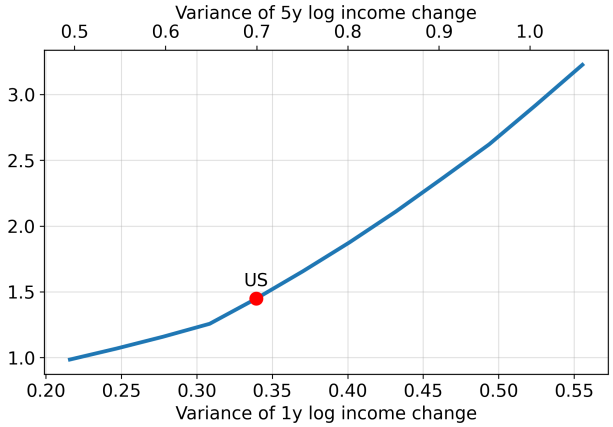
Rachel, Lukasz, and Thomas D. Smith. 2017. "Are Low Real Interest Rates Here to Stay?" *International Journal of Central Banking*, 13(3): 1–42.

World Inequality Database. 2024. "World Inequality Database." *https://wid.world*, Accessed: 2024.

Appendix A Additional Results

Figure A.1: Comparative statics for different variance calibrations

(a) Aggregate wealth



(b) Wealth distribution

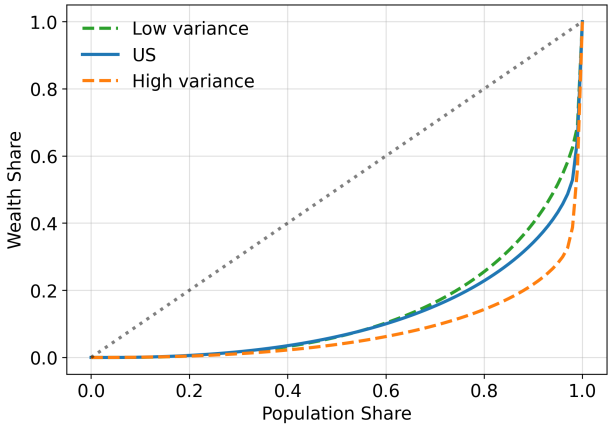
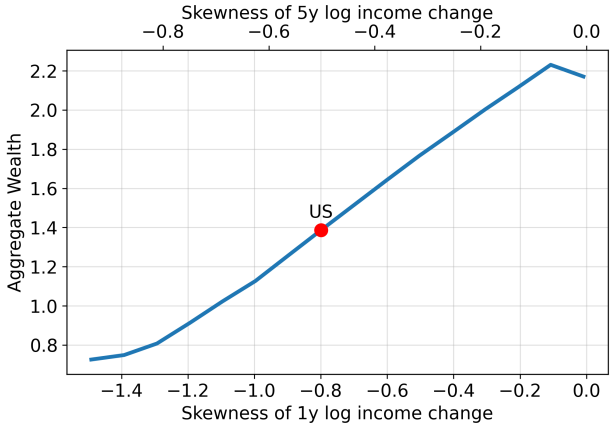


Figure A.2: Comparative statics for different skewness calibrations

(a) Aggregate wealth



(b) Wealth distribution

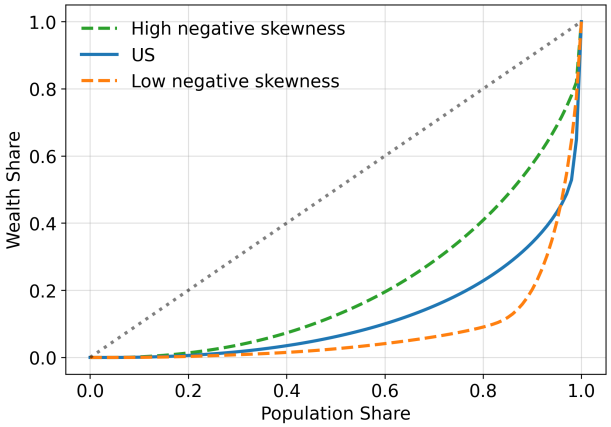


Figure A.3: Wealth effects from US closure across the wealth distribution

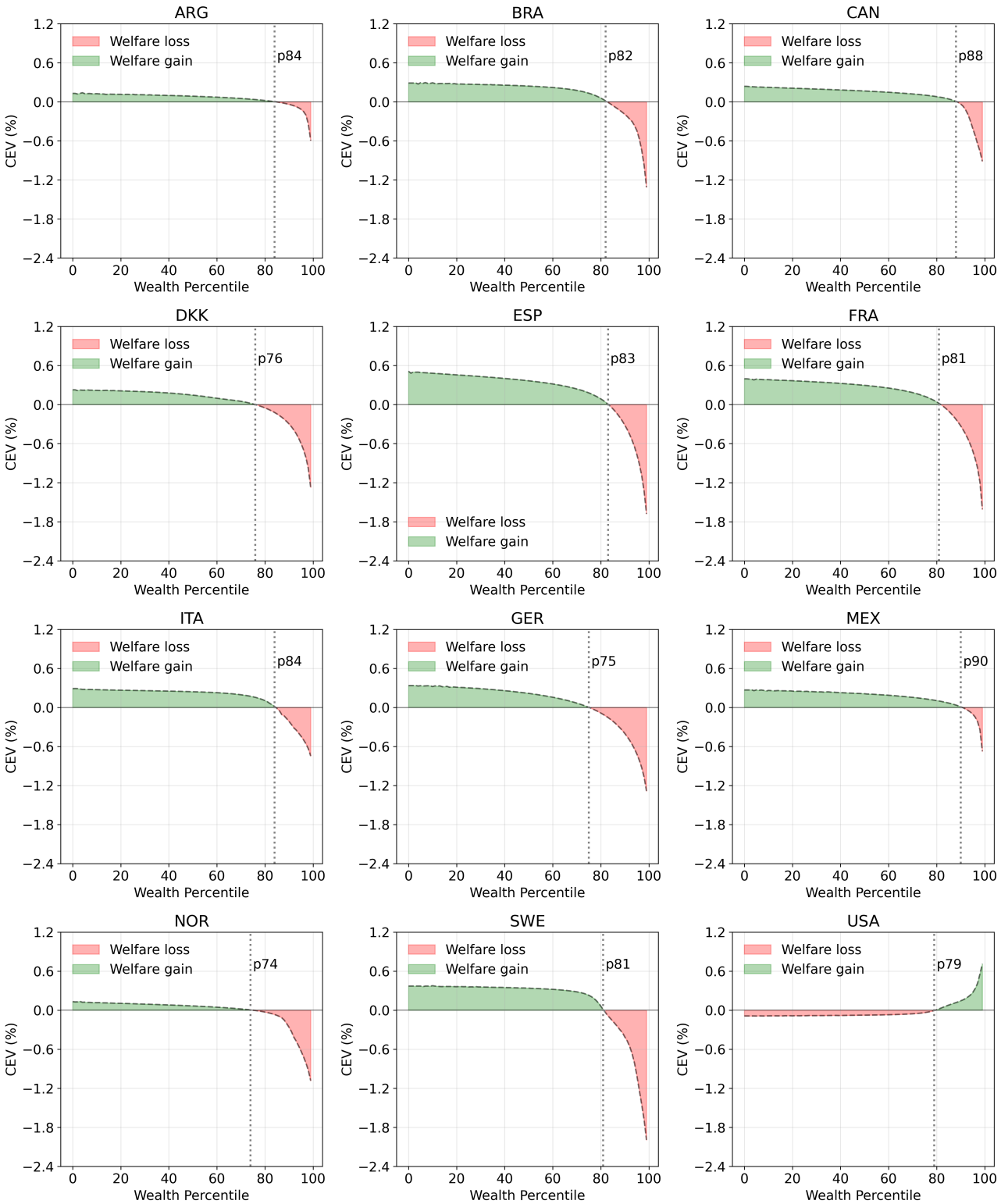
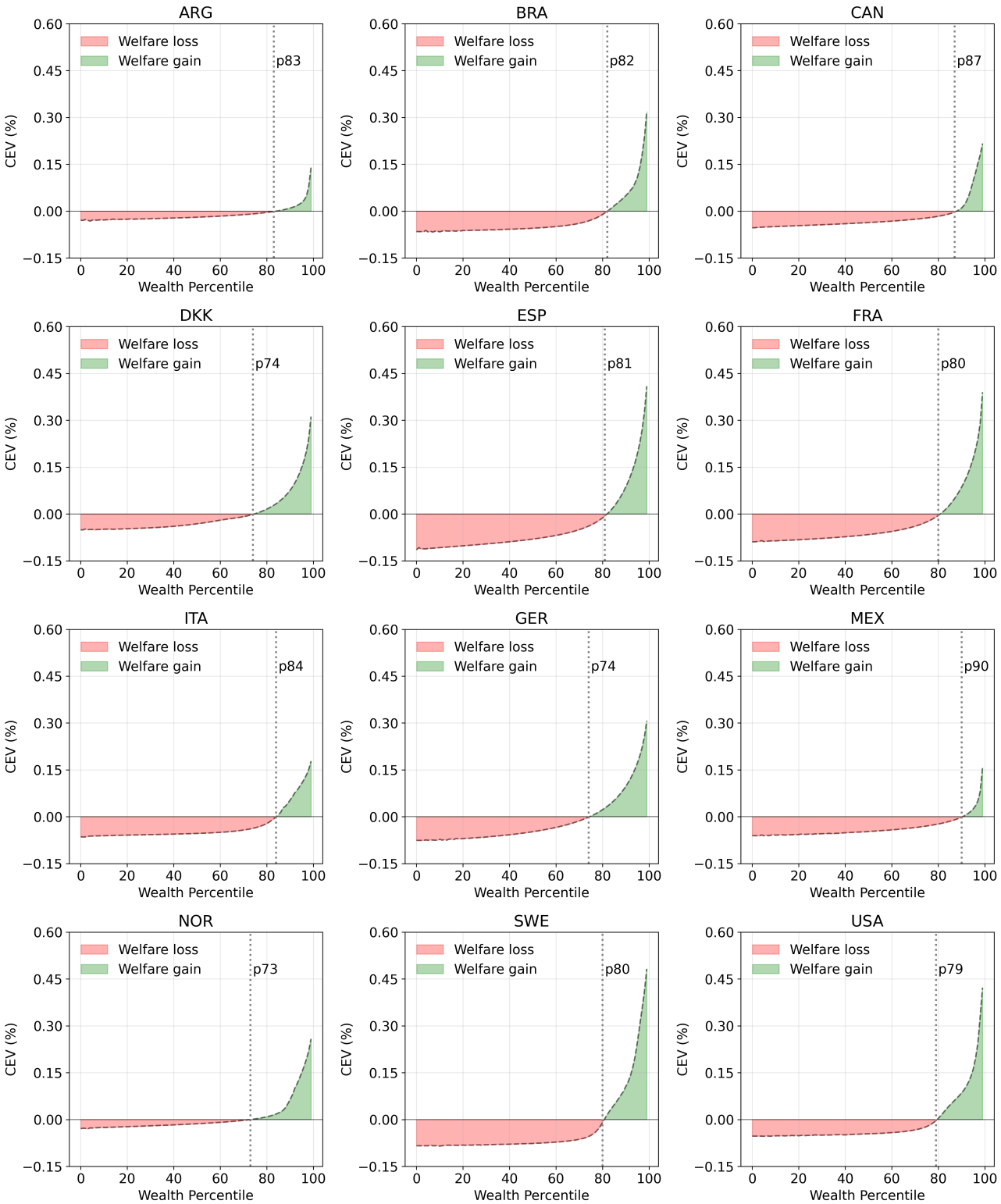
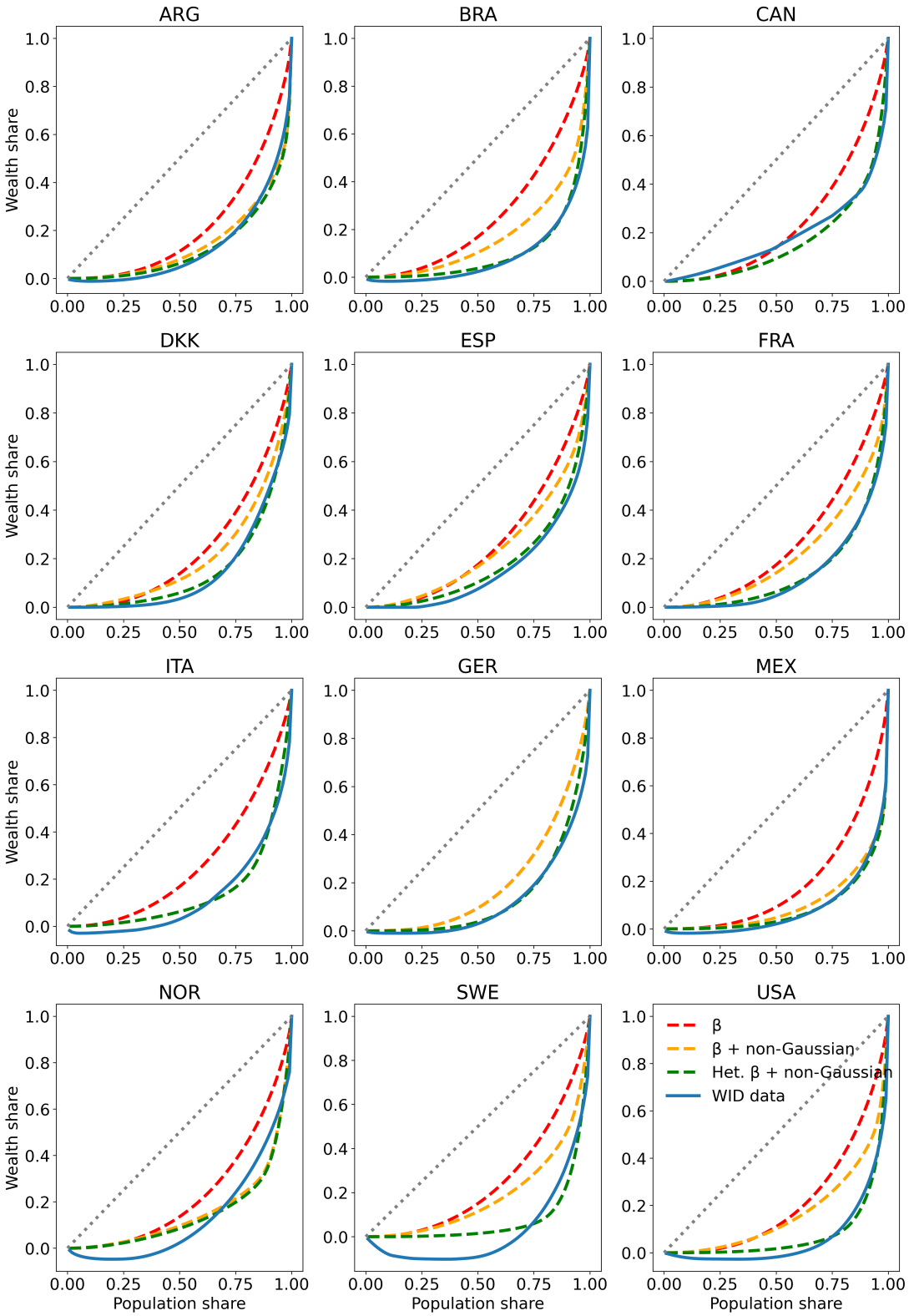


Figure A.4: Welfare effects from China closure across the wealth distribution



Appendix B Calibration

Figure B.1: Wealth distributions for each model variant



B.1 Calibration Tables

This section reports the country-level calibration underlying the baseline model with monopolistic competition and non-Gaussian income risk. For each country, the first table reports the calibrated preference and technology parameters together with the targeted aggregate moments. The second table reports the estimated income-process parameters and compares the empirical GRID moments with both the continuous estimated process and its discretized counterpart used in the quantitative model.

The baseline calibration allows the income process to match higher-order moments of income growth, including skewness and kurtosis. Germany is the only exception: because its higher-order income-risk estimates generate an unstable fit in the quantitative model, we fix Germany's income process to the Gaussian specification.

B.1.1 Argentina

Parameter	Value	Target
α	0.191	$K/Y = 3.19$ (WID)
β (single)	0.975	$A/Y = 3.53$ (WID)
$[\bar{\beta}, \zeta]$	$[0.972, 0.012]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.33	0.32	0.32	$\mu_{\eta 1}$	0.009
$S(\Delta \log e)$	-0.76	-0.77	-0.76	$\sigma^2_{\eta 1}$	0.040
$K(\Delta \log e)$	11.08	10.69	10.86	$\sigma^2_{\eta 2}$	4.680
$\text{Var}(\Delta_5 \log e)$	0.56	0.58	0.58	θ	0.993
$S(\Delta_5 \log e)$	-0.72	-0.71	-0.68	ρ	0.873
$K(\Delta_5 \log e)$	8.25	8.55	8.45	σ^2_ε	0.114

B.1.2 Brazil

Parameter	Value	Target
α	0.299	$K/Y = 4.99$ (WID)
β (single)	0.983	$A/Y = 4.51$ (WID)
$[\bar{\beta}, \zeta]$	$[0.969, 0.019]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.37	0.35	0.35	$\mu_{\eta 1}$	0.004
$S(\Delta \log e)$	-0.41	-0.41	-0.43	$\sigma^2_{\eta 1}$	0.052
$K(\Delta \log e)$	7.92	7.43	7.38	$\sigma^2_{\eta 2}$	5.951
$\text{Var}(\Delta_5 \log e)$	0.54	0.57	0.57	θ	0.997
$S(\Delta_5 \log e)$	-0.34	-0.34	-0.32	ρ	0.829
$K(\Delta_5 \log e)$	6.27	6.64	6.56	σ^2_ε	0.135

B.1.3 Canada

Parameter	Value	Target
α	0.336	$K/Y = 5.59$ (WID)
β (single)	0.984	$A/Y = 5.97$ (WID)
$[\bar{\beta}, \zeta]$	$[0.984, 0.000]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.28	0.28	0.28	$\mu_{\eta 1}$	0.004
$S(\Delta \log e)$	-0.74	-0.75	-0.76	$\sigma^2_{\eta 1}$	0.062
$K(\Delta \log e)$	12.37	12.26	12.29	$\sigma^2_{\eta 2}$	6.905
$\text{Var}(\Delta_5 \log e)$	0.52	0.52	0.52	θ	0.998
$S(\Delta_5 \log e)$	-0.54	-0.54	-0.52	ρ	0.843
$K(\Delta_5 \log e)$	8.61	8.70	8.56	σ^2_ε	0.093

B.1.4 Denmark

Parameter	Value	Target
α	0.285	$K/Y = 4.75$ (WID)
β (single)	0.987	$A/Y = 5.70$ (WID)
$[\bar{\beta}, \zeta]$	$[0.984, 0.005]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.18	0.18	0.18	$\mu_{\eta 1}$	0.011
$S(\Delta \log e)$	-0.98	-0.98	-0.96	$\sigma^2_{\eta 1}$	0.001
$K(\Delta \log e)$	15.44	15.50	15.19	$\sigma^2_{\eta 2}$	2.263
$\text{Var}(\Delta_5 \log e)$	0.34	0.34	0.34	θ	0.979
$S(\Delta_5 \log e)$	-0.70	-0.71	-0.67	ρ	0.846
$K(\Delta_5 \log e)$	10.62	10.57	10.06	σ^2_ε	0.059

B.1.5 Spain

Parameter	Value	Target
α	0.455	$K/Y = 7.59$ (WID)
β (single)	0.988	$A/Y = 6.73$ (WID)
$[\bar{\beta}, \zeta]$	$[0.987, 0.003]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.27	0.26	0.26	$\mu_{\eta 1}$	0.013
$S(\Delta \log e)$	-1.11	-1.12	-1.06	$\sigma^2_{\eta 1}$	0.025
$K(\Delta \log e)$	12.48	12.14	12.29	$\sigma^2_{\eta 2}$	2.791
$\text{Var}(\Delta_5 \log e)$	0.45	0.46	0.46	θ	0.992
$S(\Delta_5 \log e)$	-0.91	-0.91	-0.83	ρ	0.849
$K(\Delta_5 \log e)$	9.10	9.36	9.04	σ^2_ε	0.093

B.1.6 France

Parameter	Value	Target
α	0.381	$K/Y = 6.34$ (WID)
β (single)	0.987	$A/Y = 6.06$ (WID)
$[\bar{\beta}, \zeta]$	$[0.983, 0.007]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.21	0.21	0.21	$\mu_{\eta 1}$	0.005
$S(\Delta \log e)$	-0.97	-0.99	-0.93	$\sigma^2_{\eta 1}$	0.032
$K(\Delta \log e)$	13.17	12.61	13.15	$\sigma^2_{\eta 2}$	0.003
$\text{Var}(\Delta_5 \log e)$	0.36	0.37	0.38	θ	0.999
$S(\Delta_5 \log e)$	-1.03	-1.01	-0.88	ρ	0.889
$K(\Delta_5 \log e)$	9.86	10.27	10.60	σ^2_ε	0.074

B.1.7 Italy

Parameter	Value	Target
α	0.359	$K/Y = 5.99$ (WID)
β (single)	0.985	$A/Y = 5.92$ (WID)
$[\bar{\beta}, \zeta]$	$[0.985, 0.000]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.25	0.25	0.25	$\mu_{\eta 1}$	0.001
$S(\Delta \log e)$	-0.18	-0.18	-0.19	$\sigma^2_{\eta 1}$	0.043
$K(\Delta \log e)$	13.60	13.40	10.92	$\sigma^2_{\eta 2}$	10.893
$\text{Var}(\Delta_5 \log e)$	0.42	0.43	0.43	θ	0.998
$S(\Delta_5 \log e)$	-0.15	-0.15	-0.12	ρ	0.843
$K(\Delta_5 \log e)$	10.42	10.58	8.69	σ^2_ε	0.090

B.1.8 Germany

Parameter	Value	Target
α	0.332	$K/Y = 5.54$ (WID)
β (single)	0.982	$A/Y = 6.22$ (WID)
$[\bar{\beta}, \zeta]$	$[0.975, 0.012]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.16	0.16	0.16	$\mu_{\eta 1}$	0.073
$S(\Delta \log e)$	-0.01	-0.01	-0.02	$\sigma^2_{\eta 1}$	0.046
$K(\Delta \log e)$	3.00	3.00	3.01	$\sigma^2_{\eta 2}$	0.057
$\text{Var}(\Delta_5 \log e)$	0.35	0.35	0.35	θ	0.296
$S(\Delta_5 \log e)$	-0.01	-0.01	-0.01	ρ	0.936
$K(\Delta_5 \log e)$	3.00	3.00	3.00	σ^2_ε	0.050

B.1.9 Mexico

Parameter	Value	Target
α	0.284	$K/Y = 4.74$ (WID)
β (single)	0.967	$A/Y = 4.11$ (WID)
$[\bar{\beta}, \zeta]$	$[0.957, 0.024]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.41	0.41	0.41	$\mu_{\eta 1}$	0.003
$S(\Delta \log e)$	-0.33	-0.33	-0.36	$\sigma^2_{\eta 1}$	0.097
$K(\Delta \log e)$	8.44	8.23	8.36	$\sigma^2_{\eta 2}$	9.476
$\text{Var}(\Delta_5 \log e)$	0.78	0.80	0.80	θ	0.997
$S(\Delta_5 \log e)$	-0.29	-0.29	-0.27	ρ	0.881
$K(\Delta_5 \log e)$	6.16	6.33	6.40	σ^2_ε	0.138

B.1.10 Norway

Parameter	Value	Target
α	0.252	$K/Y = 4.20$ (WID)
β (single)	0.985	$A/Y = 6.91$ (WID)
$[\bar{\beta}, \zeta]$	$[0.984, 0.003]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.35	0.36	0.36	$\mu_{\eta 1}$	0.010
$S(\Delta \log e)$	-0.92	-0.92	-0.90	$\sigma^2_{\eta 1}$	0.043
$K(\Delta \log e)$	11.81	12.07	11.85	$\sigma^2_{\eta 2}$	5.614
$\text{Var}(\Delta_5 \log e)$	0.62	0.61	0.61	θ	0.995
$S(\Delta_5 \log e)$	-0.65	-0.66	-0.62	ρ	0.820
$K(\Delta_5 \log e)$	9.81	9.56	8.96	σ^2_ε	0.129

B.1.11 Sweden

Parameter	Value	Target
α	0.338	$K/Y = 5.63$ (WID)
β (single)	0.986	$A/Y = 5.83$ (WID)
$[\bar{\beta}, \zeta]$	$[0.964, 0.025]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\text{Var}(\Delta \log e)$	0.22	0.22	0.22	$\mu_{\eta 1}$	0.004
$S(\Delta \log e)$	-0.69	-0.70	-0.72	$\sigma^2_{\eta 1}$	0.046
$K(\Delta \log e)$	12.19	11.96	12.02	$\sigma^2_{\eta 2}$	5.418
$\text{Var}(\Delta_5 \log e)$	0.40	0.41	0.41	θ	0.997
$S(\Delta_5 \log e)$	-0.51	-0.50	-0.49	ρ	0.842
$K(\Delta_5 \log e)$	8.40	8.58	8.47	σ^2_ε	0.074

B.1.12 United States

Parameter	Value	Target
α	0.249	$K/Y = 4.07$ (WID)
β (single)	0.983	$A/Y = 5.21$ (WID)
$[\bar{\beta}, \zeta]$	$[0.954, 0.035]$	$[A/Y, \boldsymbol{\psi}]$

Moments	Data (GRID)	Estimated process	Discretized process	Parameters	
$\mathrm{Var}(\Delta \log e)$	0.31	0.31	0.31	$\mu_{\eta 1}$	0.008
$S(\Delta \log e)$	-0.90	-0.90	-0.88	$\sigma^2_{\eta 1}$	0.059
$K(\Delta \log e)$	12.32	12.35	12.34	$\sigma^2_{\eta 2}$	5.317
$\mathrm{Var}(\Delta_5 \log e)$	0.59	0.59	0.58	θ	0.995
$S(\Delta_5 \log e)$	-0.56	-0.56	-0.52	ρ	0.825
$K(\Delta_5 \log e)$	8.49	8.46	8.30	σ^2_ε	0.100

Appendix C Data Appendix

C.1 Construction of US Capital Stock

We construct the aggregate capital stock for the United States using data from Table B.1 of the Financial Accounts of the United States (Z.1 release). The capital stock is defined as the sum of non-financial assets across the following sectors:

- **Households:** Direct holdings of non-financial assets (Line 2; FRED series `BOGZ1LM152010005A`).
- **Non-financial non-corporate business:** Non-financial assets (Line 7; FRED series `BOGZ1LM112010005A`).
- **Financial non-corporate business:** Non-financial assets (Line 12; FRED series `BOGZ1LM662090205A`).
- **Federal Government:** Non-financial assets (Line 16; FRED series `BOGZ1LM315015005A`).
- **State and Local Governments:** Non-financial assets (Line 20; FRED series `BOGZ1LM212010095A`).
- **Non-financial corporate business:** Non-financial assets (FRED series `NCBNATA027N`).

This strategy follows the reconciliation of macroeconomics and finance for the US corporate sector outlined in Atkeson, Heathcote and Perri (2025). The value of firms' profits corresponds to the market value of domestic corporations minus their book value, namely non-financial assets.

Appendix D Motivation

In this section, we highlight empirical facts about central elements of our quantitative framework: income risk, wealth inequality, and global imbalances.

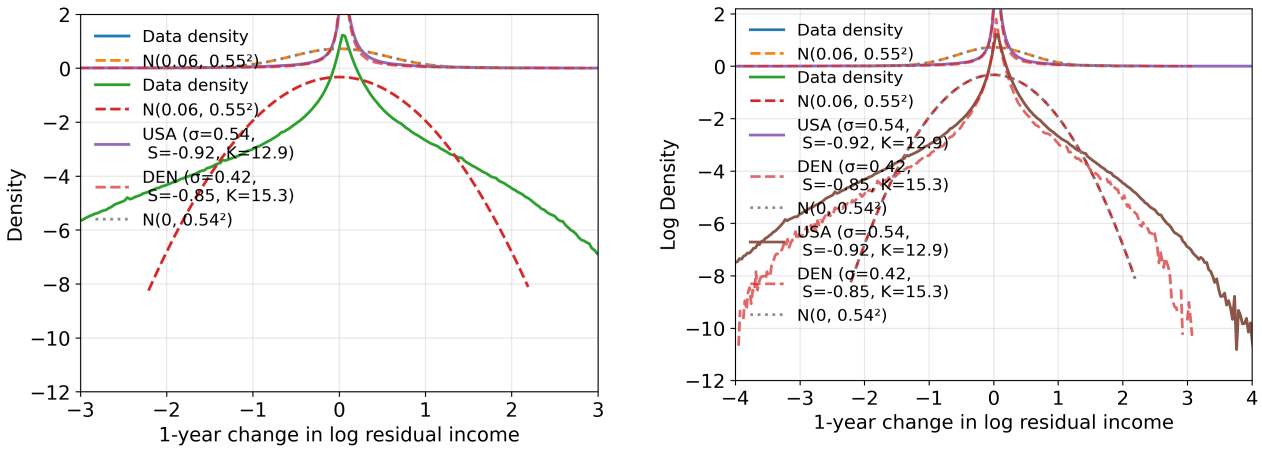
First, as documented in Guvenen, Pistaferri and Violante (2022), idiosyncratic income risk features non-Gaussian properties such as negative skewness and high kurtosis across countries (Figure D.2). That is – in any given period (i) households are more likely to face large negative shocks than large positive ones and (ii) most households experience small changes in earnings relative to overall dispersion, while a few experience extremely large shocks.

Furthermore, at the cross-section, even though income changes in all countries feature deviations from normality, the moments of income dynamics at short and longer horizons are heterogeneous across countries (Figure **??**).

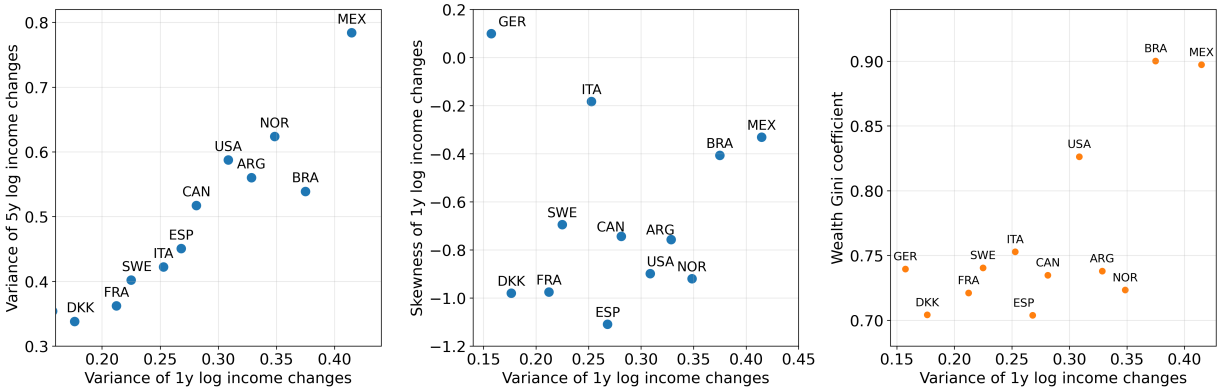
Figure D.2: Income dynamics in the US and Denmark

(a) Density

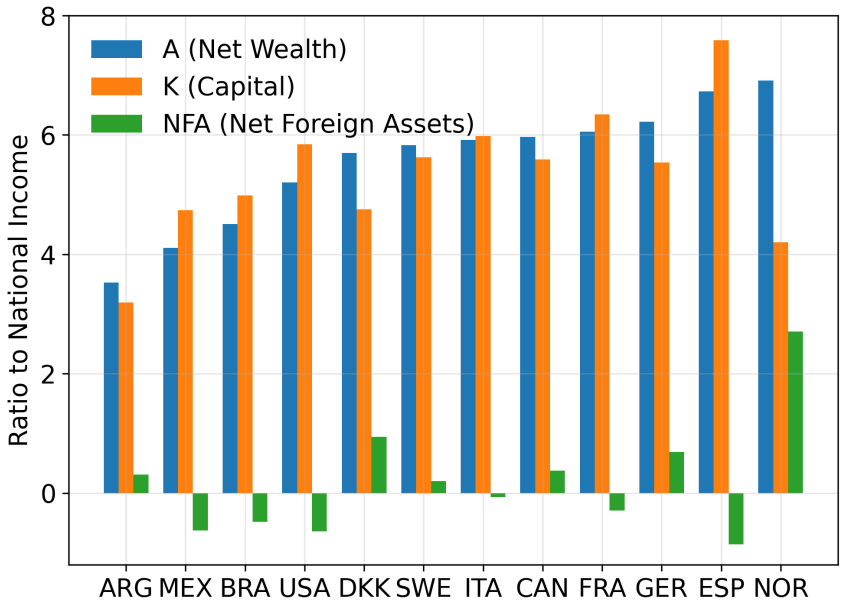
(b) Log density



Second, within-country wealth inequality displays significant cross-country heterogeneity that is closely related to differences in income risk, as seen in Figure **??**. Countries with larger income volatility, as measured by the variance of 1y log income changes, also tend to display higher wealth inequality. Finally, countries also differ considerably in terms of aggregate net wealth and capital accumulation, leading to considerable differences in external imbalances. As seen in Figure **??**, in our 12-country sample of advanced and emerging economies, some countries like Norway and Denmark are large net foreign creditors, while others such as the US, Spain, Brazil, and Mexico are net debtors vis-à-vis the rest of the world.



(a) Wealth inequality vs. income risk



(b) Aggregate wealth, capital, and NFA

Figure D.3: Wealth aggregates and inequality across countries