Deglobalization, Aging, and Global Inequality: Trade, Capital Flows, and Life-Cycle Saving

September 27, 2026

Abstract

This paper develops a dynamic multi-country, multi-sector general-equilibrium framework to study how deglobalization and demographic change jointly shape trade, welfare, and cross-country inequality. The model takes the deglobalization framework as its baseline and endogenizes the aggregate capital stock through an overlapping-generations household structure. Fertility and survival determine the evolution of the age distribution, while age-specific labor efficiency and labor-force participation determine the effective labor supply. Households choose lifetime consumption and saving, so aggregate capital ownership is the sum of age-specific asset holdings. The resulting capital stock is then allocated internationally through the existing capital-value allocation block, while production continues to use efficiency-adjusted capital services. Goods trade retains the multi-sector Eaton–Kortum structure. Demographic change therefore affects comparative advantage through both effective labor supply and endogenous capital–effective-labor ratios, while deglobalization changes the international reallocation of goods and capital. The framework is designed to quantify how aging and fragmentation interact to alter specialization, factor returns, national income, cohort welfare, and global inequality.

Keywords: Deglobalization; Demographic change; Aging; Global inequality; International capital flows; Trade; Overlapping generations
JEL Classification: F11; F14; F21; F43; J11; O11

1 Introduction

Deglobalization and population aging are two structural forces that can reshape the distribution of income across countries. Economies differ in productivity, sectoral factor intensity, demographic structure, and capital ownership. As populations age, changes in survival, fertility, and the working-age share alter labor supply and life-cycle saving. At the same time, higher barriers to trade and capital mobility change where goods are sourced, where capital is employed, and who receives the associated income. This paper studies how these two forces interact to affect trade, welfare, and global inequality.

We preserve the two margins of international integration in the deglobalization model. The first is trade in intermediate and final goods, governed by bilateral iceberg trade costs. The second is cross-border capital allocation, governed by bilateral capital-market frictions and destination-specific efficiency draws. We change only the determination of the aggregate capital stock. Instead of treating country-level capital as the choice of a representative household, we derive it from an overlapping-generations population. Fertility and survival determine the age distribution; participation and age-specific labor efficiency determine effective labor supply; and households at different ages choose consumption and saving over the life cycle. Aggregating their asset holdings delivers the raw capital stock owned by residents of each country.

This coupling introduces a direct demographic channel into comparative advantage. A change in the age structure changes effective labor supply immediately and changes capital ownership through life-cycle saving. Because sectors differ in capital intensity, the resulting movement in the capital–labor ratio changes Heckscher–Ohlin comparative advantage. At the same time, sectoral productivity differences continue to generate Ricardian comparative advantage through the Eaton–Kortum trade block. Demographic change and deglobalization can therefore reinforce or offset one another through endogenous factor abundance, goods prices, specialization, and capital returns.

The international capital block remains the one developed in the deglobalization model. The aggregate raw capital stock owned by country n, now generated by OLG saving, is allocated across host countries in value terms. Destination investment-good prices convert allocated capital value into host-country capital quantities, bilateral frictions and Fréchet efficiency draws determine portfolio shares, and firms employ the resulting efficiency-adjusted capital services. This separation between ownership, location, and productive use lets demographic saving decisions affect foreign and domestic production without introducing a second aggregate asset state.

The model is designed for counterfactuals that vary demographic paths and globalization jointly. Demographic experiments change fertility, survival, and participation; deglobalization experiments raise trade costs and capital-market frictions. The framework tracks trade shares, sectoral specialization, factor returns, GDP, GNP, net investment income, cohort consumption, and lifetime utility, allowing the quantitative analysis to distinguish changes in production from changes in residents' income and welfare.

2 Overview

The model is a dynamic multi-country, multi-sector economy with Eaton–Kortum trade, one reproducible capital type, and cross-border capital-value allocation. Relative to the existing deglobalization model, the production, trade, consumption and investment composites, international capital allocation, goods-market clearing, and national-income accounting blocks are unchanged. The only structural extension is the supply side of labor and capital: raw labor supply is generated by an age-structured population, human capital converts raw labor into effective labor, and the aggregate raw capital stock is generated by life-cycle saving in an overlapping-generations economy.

At date t, country n enters with an age distribution $\{N_{n,g,t}\}_{g=1}^{G}$ and the age-specific asset holdings inherited from the previous period. Fertility and survival determine next period's population. The current age distribution and labor-force participation determine raw labor supply $L_{n,t}$, while human capital $E^{\text{eff}}_{n,t}$ converts it into effective labor $L^{e}_{n,t}$. Households choose age-specific consumption and next-period asset holdings. Aggregating those asset holdings determines the raw capital stock $K_{n,t+1}$ owned by residents of country n. That capital is then allocated across host countries using the pre-existing capital-value shares $\lambda_{ni,t+1}$, and production in each host uses $\mathcal{K}^{\text{eff}}_{i,t+1}$.

Throughout, n denotes the investor country in the capital block and the importing country in the trade block; i denotes the host country in the capital block and the exporting country in the trade block. Age is indexed by $g \in \{1, \dots, G\}$.

3 Demographics and Labor Supply

Let $N_{n,g,t}$ denote the number of age-g households alive in country n at date t, and let

$$N_{n,t} \equiv \sum_{g=1}^{G} N_{n,g,t}. \tag{1}$$

Fertility and survival are exogenous. Let $f_{n,g,t}$ denote fertility of age-g households and let $s_{n,g,t}$ denote the probability of surviving from age $g-1$ to age g. As in the OLG model, population evolves according to

$$N_{n,1,t+1} = s_{n,1,t} \sum_{g=1}^{G} f_{n,g,t} N_{n,g,t}, \tag{2}$$

$$N_{n,g+1,t+1} = s_{n,g+1,t+1} N_{n,g,t}, \qquad g = 1, \ldots, G-1. \tag{3}$$

For a cohort born at date t, define the unconditional probability of surviving to age g by

$$S_{n,1,t} = 1, \qquad S_{n,g,t+g-1} \equiv \prod_{h=2}^{g} s_{n,h,t+h-1}, \qquad g = 2, \ldots, G. \tag{4}$$

Let l_g denote the age-specific labor endowment used in the OLG model, with $l_g = 0$ outside working ages, and let $\tau^L_{n,t} \in [0,1]$ denote the fraction of potential workers excluded from employment for reasons unrelated to age. The OLG labor-supply block is retained directly:

$$L_{n,t} \equiv (1 - \tau^L_{n,t}) \sum_{g=1}^{G} N_{n,g,t} l_g, \qquad L^e_{n,t} \equiv E^{\text{eff}}_{n,t} L_{n,t}. \tag{5}$$

Here $E^{\text{eff}}_{n,t}$ is the human-capital adjustment denoted by $E_{n,t}$ in the OLG model. We rename it only to avoid conflict with the destination-specific capital-efficiency scale $E_{i,t}$ already used in the deglobalization capital-allocation block. The wage $w_{n,t}$ is the price of one efficiency unit of labor. Hence an age-g participating household receives labor income $w_{n,t}(1 - \tau^L_{n,t}) E^{\text{eff}}_{n,t} l_g$.

4 Production

There are N countries, $n, i, h \in \{1, \ldots, N\}$, and J sectors, $j, k \in \{1, \ldots, J\}$. Sector j in country n uses labor, productive capital services, and intermediate inputs. The cost shares satisfy

$$\gamma^L_{n,j} + \gamma^K_{n,j} + \sum_{k=1}^{J} \gamma^X_{n,jk} = 1. \tag{6}$$

The unit-cost function is the one-capital specialization of the deglobalization production block:

$$c_{n,j,t} = B_{n,j} (w_{n,t})^{\gamma^L_{n,j}} (r_{n,t})^{\gamma^K_{n,j}} \prod_{k=1}^{J} (P_{n,k,t})^{\gamma^X_{n,jk}}, \tag{7}$$

where

$$B_{n,j} \equiv (\gamma^L_{n,j})^{-\gamma^L_{n,j}} (\gamma^K_{n,j})^{-\gamma^K_{n,j}} \prod_{k=1}^{J} (\gamma^X_{n,jk})^{-\gamma^X_{n,jk}}. \tag{8}$$

Here $w_{n,t}$ is the wage per efficiency unit of labor and $r_{n,t}$ is the rental rate per efficiency unit of capital. The effective labor input $L^e_{n,t}$ is supplied by the demographic block in Section 3. Production therefore uses $\mathcal{K}^{\text{eff}}_{n,t}$ rather than the raw capital quantity owned by domestic households.

Let $Y_{n,j,t}$ denote nominal sectoral revenue. Factor payments satisfy

$$w_{n,t}L^e_{n,t} = \sum_{j=1}^{J} \gamma^L_{n,j} Y_{n,j,t}, \tag{9}$$

$$r_{n,t}\mathcal{K}^{\text{eff}}_{n,t} = \sum_{j=1}^{J} \gamma^K_{n,j} Y_{n,j,t}. \tag{10}$$

5 Trade

Trade follows the Eaton–Kortum block in the deglobalization model. Let $A_{i,j,t}$ denote sectoral productivity and $\kappa_{ni,j,t} \geq 1$ bilateral iceberg trade costs, with $\kappa_{nn,j,t} = 1$. Define

$$\Phi_{n,j,t} \equiv \sum_{i=1}^{N} (A_{i,j,t})^{\theta_j} (\kappa_{ni,j,t} c_{i,j,t})^{-\theta_j}. \tag{11}$$

The sectoral price index is

$$P_{n,j,t} = \mathcal{A}_j (\Phi_{n,j,t})^{-1/\theta_j}, \tag{12}$$

and the bilateral expenditure share is

$$\pi_{ni,j,t} = \frac{(A_{i,j,t})^{\theta_j} (\kappa_{ni,j,t} c_{i,j,t})^{-\theta_j}}{\Phi_{n,j,t}}. \tag{13}$$

Let $Z_{ni,j,t}$ denote expenditure by country n on sector-j goods produced by country i, and let

$$Z_{n,j,t} \equiv \sum_{i=1}^{N} Z_{ni,j,t}, \qquad Z_{ni,j,t} = \pi_{ni,j,t} Z_{n,j,t}. \tag{14}$$

Producer revenue is

$$Y_{n,j,t} \equiv \sum_{i=1}^{N} Z_{in,j,t} = \sum_{i=1}^{N} \pi_{in,j,t} Z_{i,j,t}. \tag{15}$$

6 Consumption and Investment Composites

As in the deglobalization household block,

$$C_{n,t} = \prod_{j=1}^{J} (C_{n,j,t})^{\beta^C_{n,j}}, \qquad I_{n,t} = \prod_{j=1}^{J} (I_{n,j,t})^{\beta^I_{n,j}}, \tag{16}$$

with

$$\sum_{j=1}^{J} \beta^C_{n,j} = 1, \qquad \sum_{j=1}^{J} \beta^I_{n,j} = 1.$$

The corresponding price indices are

$$P^C_{n,t} = \prod_{j=1}^{J} \left(\frac{P_{n,j,t}}{\beta^C_{n,j}} \right)^{\beta^C_{n,j}}, \qquad P^I_{n,t} = \prod_{j=1}^{J} \left(\frac{P_{n,j,t}}{\beta^I_{n,j}} \right)^{\beta^I_{n,j}}. \tag{17}$$

Cost minimization within the Cobb–Douglas consumption and investment composites implies the sector-level expenditure conditions

$$P_{n,j,t} C_{n,j,t} = \beta^C_{n,j} P^C_{n,t} C_{n,t}, \qquad P_{n,j,t} I_{n,j,t} = \beta^I_{n,j} P^I_{n,t} I_{n,t}, \qquad \forall (n, j, t). \tag{18}$$

There is one investment good, one capital type, no installation-efficiency term, and no investment wedge.

7 OLG Household Saving and Endogenous Capital

This section replaces the representative-household saving block of the deglobalization model with the OLG saving block. All production, trade, and international capital-allocation equations remain unchanged. The household asset $a_{n,g,t}$ is measured in units of the same raw capital whose aggregate stock is denoted by $K_{n,t}$; it is therefore not a separate aggregate financial asset.

7.1 Lifetime consumption and saving

A household born in country n at date t chooses lifetime consumption $\{c_{n,g,t+g-1}\}_{g=1}^{G}$ and next-period raw-capital holdings $\{a_{n,g+1,t+g}\}_{g=1}^{G-1}$, subject to the non-negativity constraint on saving. Period utility is CRRA,

$$u(c) = \frac{c^{1-1/\sigma}}{1 - 1/\sigma}, \qquad \sigma > 0, \tag{19}$$

with the log case understood as the limit when $\sigma = 1$. Following the OLG model, the cohort solves

$$\max_{\{c_{n,g,t+g-1}>0,\ a_{n,g+1,t+g}\geq 0\}} \sum_{g=1}^{G} \psi_{n,t+g-1}\beta^{g-1} S_{n,g,t+g-1} u(c_{n,g,t+g-1}), \tag{20}$$

where $\beta \in (0,1)$ and $\psi_{n,t} > 0$ is the saving wedge from the OLG model.

The deglobalization model already defines the gross return on one unit of raw capital owned by residents of country n as

$$R_{n,t} \equiv (1-\delta) + \frac{V_{n,t}}{P^I_{n,t}}, \tag{21}$$

so that one unit of beginning-of-period capital pays $P^I_{n,t}R_{n,t} = (1-\delta)P^I_{n,t} + V_{n,t}$ at date t. The age-g household budget at calendar date t is therefore the OLG budget with the return block replaced by the deglobalization portfolio return:

$$P^C_{n,t}c_{n,g,t} + P^I_{n,t}a_{n,g+1,t+1} = P^I_{n,t}R_{n,t}a_{n,g,t} + w_{n,t}(1-\tau^L_{n,t})E^{\text{eff}}_{n,t}l_g + tr^D_{n,t} + tr^T_{n,t}, \tag{22}$$

for $g = 1, \ldots, G$, with

$$a_{n,1,t} = 0, \qquad a_{n,G+1,t+1} = 0, \qquad c_{n,g,t} > 0. \tag{23}$$

The aggregate transfer already present in the deglobalization model is distributed equally across residents,

$$tr^T_{n,t} \equiv \frac{T^D_{n,t}}{N_{n,t}}. \tag{24}$$

Accidental bequests are also redistributed equally. Retaining the OLG notation, the accidental-bequest transfer is

$$tr^D_{n,t} \equiv \frac{P^I_{n,t}R_{n,t}}{N_{n,t}} \sum_{g=2}^{G} \left(N_{n,g-1,t-1} - N_{n,g,t}\right) a_{n,g,t}. \tag{25}$$

This is the original OLG accidental-bequest term, with $P^I_{n,t}(1 + r^{\text{OLG}}_{n,t})$ written as the same one-period capital payoff $P^I_{n,t}R_{n,t}$ implied by the deglobalization return block.

For an unconstrained saver, the Euler equation is

$$u'\left(c_{n,g,t}\right) = \beta s_{n,g+1,t+1} \left(\frac{\psi_{n,t+1}}{\psi_{n,t}}\right) \left(\frac{P^I_{n,t+1}/P^C_{n,t+1}}{P^I_{n,t}/P^C_{n,t}}\right) R_{n,t+1}\, u'\left(c_{n,g+1,t+1}\right), \qquad g = 1, \ldots, G-1. \tag{26}$$

For CRRA utility, this can equivalently be written as

$$\frac{c_{n,g+1,t+1}}{c_{n,g,t}} = \left[\beta s_{n,g+1,t+1}\left(\frac{\psi_{n,t+1}}{\psi_{n,t}}\right)\left(\frac{P^I_{n,t+1}/P^C_{n,t+1}}{P^I_{n,t}/P^C_{n,t}}\right)R_{n,t+1}\right]^{\sigma}. \tag{27}$$

7.2 Aggregation and the capital law of motion

Individual consumption aggregates to the same country-level consumption composite already used in the deglobalization model:

$$C_{n,t} \equiv \sum_{g=1}^{G} N_{n,g,t}c_{n,g,t}. \tag{28}$$

The beginning-of-period raw capital stock owned by residents of country n is the sum of the asset holdings chosen by the previous-period cohorts,

$$K_{n,t} \equiv \sum_{g=2}^{G} N_{n,g-1,t-1}a_{n,g,t}, \qquad K_{n,t+1} \equiv \sum_{g=1}^{G-1} N_{n,g,t}a_{n,g+1,t+1}. \tag{29}$$

Aggregate gross investment is therefore still defined exactly as in the deglobalization model,

$$I_{n,t} \equiv K_{n,t+1} - (1-\delta)K_{n,t}, \qquad K_{n,t+1} = (1-\delta)K_{n,t} + I_{n,t}. \tag{30}$$

The difference is that $K_{n,t+1}$ is now determined by the collection of age-specific household saving choices in (29), rather than by a representative household.

Summing (22) across ages and using (25) recovers the original aggregate deglobalization budget exactly:

$$P^C_{n,t}C_{n,t} + P^I_{n,t}I_{n,t} = V_{n,t}K_{n,t} + w_{n,t}L^e_{n,t} + T^D_{n,t} \equiv IN_{n,t} + T^D_{n,t}, \tag{31}$$

where

$$IN_{n,t} \equiv V_{n,t}K_{n,t} + w_{n,t}L^e_{n,t}. \tag{32}$$

Using $K_{n,t+1} = (1-\delta)K_{n,t} + I_{n,t}$, the same aggregate budget can equivalently be written in recursive capital form as

$$P^C_{n,t}C_{n,t} + P^I_{n,t}K_{n,t+1} = \left[(1-\delta)P^I_{n,t} + V_{n,t}\right]K_{n,t} + w_{n,t}L^e_{n,t} + T^D_{n,t} = P^I_{n,t}R_{n,t}K_{n,t} + w_{n,t}L^e_{n,t} + T^D_{n,t}. \tag{33}$$

Thus the OLG block changes the determination of $L^e_{n,t}$ and $K_{n,t}$ but leaves the aggregate accounting identity used by the deglobalization model unchanged.

8 Cross-Border Capital-Value Allocation

8.1 Value share

The original deglobalization block uses $\lambda_{ni,t} = K_{ni,t}/K_{n,t}$. To allocate capital *value* instead of capital quantity, we replace that identity by

$$P^I_{n,t} K_{n,t} = \sum_{i=1}^{N} P^I_{i,t} K_{ni,t}. \tag{34}$$

Hence the bilateral portfolio share is

$$\lambda_{ni,t} \equiv \frac{P^I_{i,t} K_{ni,t}}{P^I_{n,t} K_{n,t}}, \qquad \sum_{i=1}^{N} \lambda_{ni,t} = 1. \tag{35}$$

Equivalently,

$$K_{ni,t} = \lambda_{ni,t} \frac{P^I_{n,t}}{P^I_{i,t}} K_{n,t}. \tag{36}$$

This is precisely the price conversion required by value allocation: one dollar of capital value in host i buys $1/P^I_{i,t}$ units of host-i capital.

8.2 Fréchet allocation

As in the original capital block, investor n faces bilateral capital-market friction $\nu_{ni,t} \geq 1$, with $\nu_{nn,t} = 1$, and draws idiosyncratic capital-use efficiency $e_{ni,t}(q)$ with destination scale $E_{i,t}$ and dispersion $\varepsilon > 1$.

Because the investor now allocates value, the relevant payoff from one dollar invested in host i is

$$\frac{e_{ni,t}(q) r_{i,t}}{\nu_{ni,t} P^I_{i,t}}. \tag{37}$$

Therefore the value share is the price-adjusted version of the original H6 equation:

$$\lambda_{ni,t} = \frac{\left(E_{i,t} r_{i,t} / (\nu_{ni,t} P^I_{i,t}) \right)^{\varepsilon}}{\sum_{h=1}^{N} \left(E_{h,t} r_{h,t} / (\nu_{nh,t} P^I_{h,t}) \right)^{\varepsilon}}. \tag{38}$$

Conditional mean efficiency retains exactly the original Fréchet form:

$$\bar{e}_{ni,t} = \Gamma\left(1 - \frac{1}{\varepsilon}\right) E_{i,t} (\lambda_{ni,t})^{-1/\varepsilon}. \tag{39}$$

8.3 Capital income and effective units

Define, as in the original model, the capital income generated by one raw unit of investor-n capital allocated to host i as

$$V_{ni,t} \equiv \frac{r_{i,t}\bar{e}_{ni,t}}{\nu_{ni,t}}. \tag{40}$$

Under quantity allocation the original model implies $V_{ni,t} = V_{n,t}$. Under value allocation, the corresponding equality is instead in returns per dollar of capital value:

$$\frac{V_{ni,t}}{P^I_{i,t}} = \frac{V_{n,t}}{P^I_{n,t}} = \Gamma\left(1 - \frac{1}{\varepsilon}\right)\left[\sum_{h=1}^{N}\left(\frac{E_{h,t}r_{h,t}}{\nu_{nh,t}P^I_{h,t}}\right)^{\varepsilon}\right]^{1/\varepsilon}. \tag{41}$$

Combining (34) and (41) yields

$$V_{n,t}K_{n,t} = \sum_{i=1}^{N} V_{ni,t}K_{ni,t}, \tag{42}$$

which is why the household budget in (31) retains exactly the original capital-income term $V_{n,t}K_{n,t}$.

Productive capital services are defined exactly as in the deglobalization capital block:

$$\mathcal{K}^{\text{eff}}_{ni,t} \equiv \frac{\bar{e}_{ni,t}}{\nu_{ni,t}}K_{ni,t}, \tag{43}$$

and host-country productive capital is

$$\mathcal{K}^{\text{eff}}_{i,t} = \sum_{n=1}^{N}\frac{\bar{e}_{ni,t}}{\nu_{ni,t}}K_{ni,t}. \tag{44}$$

Capital-market clearing on the production side is therefore

$$r_{i,t}\mathcal{K}^{\text{eff}}_{i,t} = \sum_{n=1}^{N} V_{ni,t}K_{ni,t}. \tag{45}$$

Thus $K_{n,t}$ is the raw capital stock owned by investor country n, $K_{ni,t}$ is the host-i capital quantity corresponding to the value allocated by investor n, and $\mathcal{K}^{\text{eff}}_{i,t}$ is the productive capital service used by firms in host country i.

9 Goods-Market Equilibrium

Sector-j expenditure in country n is the one-capital specialization of the aggregate-expenditure equation in the deglobalization model:

$$Z_{n,j,t} = \beta^C_{n,j} P^C_{n,t} C_{n,t} + \beta^I_{n,j} P^I_{n,t} I_{n,t} + \sum_{k=1}^{J} \gamma^X_{n,jk} \left(\sum_{i=1}^{N} Z_{in,k,t} \right). \tag{46}$$

Together with (15), (9), and (10), this closes the within-period goods and factor markets.

The trade-imbalance equation also keeps the form of the deglobalization model:

$$\sum_{j=1}^{J} \sum_{i=1}^{N} \left(Z_{ni,j,t} - Z_{in,j,t} \right) = V_{n,t} K_{n,t} - r_{n,t} \mathcal{K}^{\text{eff}}_{n,t} + T^D_{n,t}. \tag{47}$$

The left-hand side is imports minus exports. The first two terms on the right-hand side will below be identified as net investment income.

10 GDP, GNP, and Net Investment Income

The model now distinguishes clearly between the *location* of production and the *ownership* of capital. This allows GDP and GNP to be written entirely with the symbols already defined above.

GDP. Nominal GDP is location based. For country n it is the labor income and capital income generated by production located in n:

$$GDP_{n,t} \equiv w_{n,t} L^e_{n,t} + r_{n,t} \mathcal{K}^{\text{eff}}_{n,t}. \tag{48}$$

GNP. Nominal GNP is ownership based. Labor is immobile, while residents of country n own the raw capital stock $K_{n,t}$ and receive total capital income $V_{n,t} K_{n,t}$. Therefore

$$GNP_{n,t} \equiv w_{n,t} L^e_{n,t} + V_{n,t} K_{n,t}. \tag{49}$$

In this model, GNP is the same national-income aggregate usually denoted GNI.

Net investment income. Net investment income is capital income received by residents of country n minus capital income generated in country n and paid to all owners. Hence

$$NII_{n,t} \equiv V_{n,t} K_{n,t} - r_{n,t} \mathcal{K}^{\text{eff}}_{n,t}. \tag{50}$$

Using (42) and (45), the same object can be written bilaterally as

$$NII_{n,t} = \sum_{i=1}^{N} V_{ni,t} K_{ni,t} - \sum_{h=1}^{N} V_{hn,t} K_{hn,t}. \tag{51}$$

The first term is total capital income received on capital owned by residents of n across all host countries; the second is total capital income generated by capital in host country n and accruing to investors from all countries. Domestic ownership appears in both sums and cancels in net investment income.

It follows immediately that

$$GNP_{n,t} = GDP_{n,t} + NII_{n,t}, \qquad GNP_{n,t} - GDP_{n,t} = NII_{n,t}. \tag{52}$$

United States. Setting $n = \text{US}$ gives

$$GDP_{\text{US},t} = w_{\text{US},t} L^{e}_{\text{US},t} + r_{\text{US},t} \mathcal{K}^{\text{eff}}_{\text{US},t}, \tag{53}$$

$$GNP_{\text{US},t} = w_{\text{US},t} L^{e}_{\text{US},t} + V_{\text{US},t} K_{\text{US},t}, \tag{54}$$

$$NII_{\text{US},t} = V_{\text{US},t} K_{\text{US},t} - r_{\text{US},t} \mathcal{K}^{\text{eff}}_{\text{US},t} \tag{55}$$

and equivalently

$$NII_{\text{US},t} = \sum_{i=1}^{N} V_{\text{US},i,t} K_{\text{US},i,t} - \sum_{h=1}^{N} V_{h,\text{US},t} K_{h,\text{US},t}. \tag{56}$$

Therefore

$$GNP_{\text{US},t} = GDP_{\text{US},t} + NII_{\text{US},t}. \tag{57}$$

Notice that (47) can now be written directly as

$$\sum_{j=1}^{J} \sum_{i=1}^{N} \left(Z_{ni,j,t} - Z_{in,j,t} \right) = NII_{n,t} + T^{D}_{n,t}, \tag{58}$$

which is exactly the national-income interpretation of the capital-income terms already present in the original deglobalization equilibrium table.

11 Equilibrium Definition

Given initial age distributions $\{N_{n,g,0}\}$, initial age-specific assets $\{a_{n,g,0}\}$, demographic paths $\{f_{n,g,t}, s_{n,g,t}, \tau^{L}_{n,t}\}$, human-capital paths $\{E^{\text{eff}}_{n,t}\}$, trade fundamentals $\{A_{n,j,t}, \kappa_{ni,j,t}\}$, capital-efficiency fundamentals $\{E_{i,t}\}$, capital-market frictions $\{\nu_{ni,t}\}$, saving wedges $\{\psi_{n,t}\}$, and transfers $\{T^D_{n,t}\}$, a perfect-foresight equilibrium is a sequence of demographic allocations, age-specific household choices, aggregate allocations, and prices satisfying the demographic laws (2)–(3); the OLG household problem (20)–(26); aggregation (28)–(29); firms' cost minimization; Eaton–Kortum trade; cross-border capital-value allocation; and all goods, labor, raw-capital-value, and capital-service market-clearing conditions.

The aggregate state relevant for the deglobalization block is still $\{K_{n,t}\}$, but it is now generated endogenously by the underlying distribution of age-specific assets. Demographic change therefore affects current production through $L^e_{n,t}$ and future factor abundance through $K_{n,t+1}$. Following the OLG model, nominal prices are pinned down by choosing world GDP as the numeraire each period:

$$\sum_{n=1}^{N} GDP_{n,t} = 1, \qquad \forall t. \tag{59}$$

This normalization only fixes the unit of account and has no effect on real allocations.

Table 1: Dynamic equilibrium: deglobalization model with OLG labor supply and endogenous capital

ID	Equilibrium condition	Scope
(D1)	$N_{n,t} = \sum_{g=1}^{G} N_{n,g,t}, \quad N_{n,1,t+1} = s_{n,1,t} \sum_{g=1}^{G} f_{n,g,t} N_{n,g,t}, \quad N_{n,g+1,t+1} = s_{n,g+1,t+1} N_{n,g,t}$	$\forall(n,g,t)$
(D2)	$L_{n,t} = (1-\tau^{L}_{n,t}) \sum_{g=1}^{G} N_{n,g,t} l_g, \qquad L^{e}_{n,t} = E^{\text{eff}}_{n,t} L_{n,t}$	$\forall(n,t)$
(F1)	$c_{n,j,t} = B_{n,j} (w_{n,t})^{\gamma^{L}_{n,j}} (r_{n,t})^{\gamma^{K}_{n,j}} \prod_{k=1}^{J} (P_{n,k,t})^{\gamma^{X}_{n,jk}}$	$\forall(n,j,t)$
(F2)	$w_{n,t} L^{e}_{n,t} = \sum_{j=1}^{J} \gamma^{L}_{n,j} Y_{n,j,t}, \qquad r_{n,t} \mathcal{K}^{\text{eff}}_{n,t} = \sum_{j=1}^{J} \gamma^{K}_{n,j} Y_{n,j,t}$	$\forall(n,t)$
(H1)	$C_{n,t} = \prod_j (C_{n,j,t})^{\beta^{C}_{n,j}},\ I_{n,t} = \prod_j (I_{n,j,t})^{\beta^{I}_{n,j}},\ P^{C}_{n,t} = \prod_j (P_{n,j,t}/\beta^{C}_{n,j})^{\beta^{C}_{n,j}},\ P^{I}_{n,t} = \prod_j (P_{n,j,t}/\beta^{I}_{n,j})^{\beta^{I}_{n,j}}$	$\forall(n,t)$
(H1′)	$P_{n,j,t} C_{n,j,t} = \beta^{C}_{n,j} P^{C}_{n,t} C_{n,t}, \qquad P_{n,j,t} I_{n,j,t} = \beta^{I}_{n,j} P^{I}_{n,t} I_{n,t}$	$\forall(n,j,t)$
(H2)	$P^{C}_{n,t} c_{n,g,t} + P^{I}_{n,t} a_{n,g+1,t+1} = P^{I}_{n,t} R_{n,t} a_{n,g,t} + w_{n,t}(1-\tau^{L}_{n,t}) E^{\text{eff}}_{n,t} l_g + tr^{D}_{n,t} + tr^{T}_{n,t}$	$\forall(n,g,t)$
(H3)	$a_{n,1,t} = 0, \quad a_{n,G+1,t+1} = 0, \quad a_{n,g+1,t+1} \geq 0, \quad c_{n,g,t} > 0$	$\forall(n,g,t)$
(H3′)	$tr^{T}_{n,t} = T^{D}_{n,t}/N_{n,t}, \qquad tr^{D}_{n,t} = \frac{P^{I}_{n,t} R_{n,t}}{N_{n,t}} \sum_{g=2}^{G} (N_{n,g-1,t-1} - N_{n,g,t}) a_{n,g,t}$	$\forall(n,t)$
(H4)	$u'(c_{n,g,t}) = \beta s_{n,g+1,t+1} (\psi_{n,t+1}/\psi_{n,t}) \left[\frac{P^{I}_{n,t+1}/P^{C}_{n,t+1}}{P^{I}_{n,t}/P^{C}_{n,t}} \right] R_{n,t+1} u'(c_{n,g+1,t+1})$	$\forall(n,g<G,t)$
(H5)	$C_{n,t} = \sum_g N_{n,g,t} c_{n,g,t}, \quad K_{n,t} = \sum_{g=2}^{G} N_{n,g-1,t-1} a_{n,g,t}, \quad K_{n,t+1} = \sum_{g=1}^{G-1} N_{n,g,t} a_{n,g+1,t+1}$	$\forall(n,t)$
(H5′)	$R_{n,t} = (1-\delta) + V_{n,t}/P^{I}_{n,t}, \qquad K_{n,t+1} = (1-\delta) K_{n,t} + I_{n,t}$	$\forall(n,t)$
(H5″)	$P^{C}_{n,t} C_{n,t} + P^{I}_{n,t} I_{n,t} = V_{n,t} K_{n,t} + w_{n,t} L^{e}_{n,t} + T^{D}_{n,t} \equiv IN_{n,t} + T^{D}_{n,t}$	$\forall(n,t)$
(H5‴)	$P^{C}_{n,t} C_{n,t} + P^{I}_{n,t} K_{n,t+1} = P^{I}_{n,t} R_{n,t} K_{n,t} + w_{n,t} L^{e}_{n,t} + T^{D}_{n,t}$	$\forall(n,t)$
(H6)	$\lambda_{ni,t} = \frac{P^{I}_{i,t} K_{ni,t}}{P^{I}_{n,t} K_{n,t}} = \frac{(E_{i,t} r_{i,t}/(\nu_{ni,t} P^{I}_{i,t}))^{\varepsilon}}{\sum_h (E_{h,t} r_{h,t}/(\nu_{nh,t} P^{I}_{h,t}))^{\varepsilon}}, \quad \sum_i \lambda_{ni,t} = 1$	$\forall(n,i,t)$
(H6′)	$P^{I}_{n,t} K_{n,t} = \sum_i P^{I}_{i,t} K_{ni,t}, \qquad K_{ni,t} = \lambda_{ni,t} (P^{I}_{n,t}/P^{I}_{i,t}) K_{n,t}$	$\forall(n,i,t)$
(H7)	$\bar{e}_{ni,t} = \Gamma(1-1/\varepsilon) E_{i,t} \lambda_{ni,t}^{-1/\varepsilon}, \quad V_{ni,t} = r_{i,t} \bar{e}_{ni,t}/\nu_{ni,t}$	$\forall(n,i,t)$
(H7′)	$\frac{V_{ni,t}}{P^{I}_{i,t}} = \frac{V_{n,t}}{P^{I}_{n,t}} = \Gamma(1-1/\varepsilon) \left[\sum_h \left(\frac{E_{h,t} r_{h,t}}{\nu_{nh,t} P^{I}_{h,t}} \right)^{\varepsilon} \right]^{1/\varepsilon}$	$\forall(n,i,t)$
(H8)	$\mathcal{K}^{\text{eff}}_{ni,t} = \bar{e}_{ni,t} K_{ni,t}/\nu_{ni,t}, \quad \mathcal{K}^{\text{eff}}_{i,t} = \sum_n \mathcal{K}^{\text{eff}}_{ni,t}, \quad V_{n,t} K_{n,t} = \sum_i V_{ni,t} K_{ni,t}$	$\forall(n,i,t)$
(H8′)	$r_{i,t} \mathcal{K}^{\text{eff}}_{i,t} = \sum_n V_{ni,t} K_{ni,t}$	$\forall(i,t)$
(T1)	$P_{n,j,t} = \mathcal{A}_j \Phi_{n,j,t}^{-1/\theta_j}, \qquad \Phi_{n,j,t} = \sum_i (A_{i,j,t})^{\theta_j} (\kappa_{ni,j,t} c_{i,j,t})^{-\theta_j}$	$\forall(n,j,t)$
(T2)	$\pi_{ni,j,t} = \frac{(A_{i,j,t})^{\theta_j} (\kappa_{ni,j,t} c_{i,j,t})^{-\theta_j}}{\Phi_{n,j,t}}, \qquad Z_{ni,j,t} = \pi_{ni,j,t} Z_{n,j,t}$	$\forall(n,i,j,t)$
(T3)	$Y_{n,j,t} = \sum_i Z_{in,j,t}, \quad Z_{n,j,t} = \beta^{C}_{n,j} P^{C}_{n,t} C_{n,t} + \beta^{I}_{n,j} P^{I}_{n,t} I_{n,t} + \sum_k \gamma^{X}_{n,jk} (\sum_i Z_{in,k,t})$	$\forall(n,j,t)$
(T4)	$\sum_j \sum_i (Z_{ni,j,t} - Z_{in,j,t}) = V_{n,t} K_{n,t} - r_{n,t} \mathcal{K}^{\text{eff}}_{n,t} + T^{D}_{n,t}$	$\forall(n,t)$
(T4′)	$\sum_j \sum_i (Z_{ni,j,t} - Z_{in,j,t}) = NII_{n,t} + T^{D}_{n,t}$	$\forall(n,t)$
(N1)	$GDP_{n,t} = w_{n,t} L^{e}_{n,t} + r_{n,t} \mathcal{K}^{\text{eff}}_{n,t}, \qquad GNP_{n,t} = w_{n,t} L^{e}_{n,t} + V_{n,t} K_{n,t}$	$\forall(n,t)$
(N2)	$NII_{n,t} = V_{n,t} K_{n,t} - r_{n,t} \mathcal{K}^{\text{eff}}_{n,t} = \sum_i V_{ni,t} K_{ni,t} - \sum_h V_{hn,t} K_{hn,t}, \qquad GNP_{n,t} = GDP_{n,t} + NII_{n,t}$	$\forall(n,t)$
(N0)	$\sum_{n=1}^{N} GDP_{n,t} = 1$	$\forall t$

Notes: D1–D2 and H2–H5 endogenize labor supply and the owned raw-capital stock through the OLG demographic and household blocks. H1′ restores the sector-level final-demand conditions listed explicitly in the original OLG equilibrium table. H5‴ is the recursive aggregate-budget representation implied by the OLG aggregation and the deglobalization capital law. H6′ and H7′ make explicit the value-to-quantity conversion and expected-return aggregator already contained in the deglobalization capital-allocation block. T4′ is the national-income form of T4, and N0 is the world-GDP numeraire used in the OLG model. The OLG innovation equation and BGP growth-rate rows are intentionally excluded because productivity remains exogenous in the present deglobalization model. The TTG transfer-rule rows are also not imposed here because $T^{D}_{n,t}$ remains an exogenous transfer path in the current deglobalization specification.

References

A Additional Model Derivations

B Data and Calibration

C Additional Quantitative Results