Globalization Accounting

Sterre Kuipers Hyunju Lee* Radoslaw Paluszynski

Department of Economics
University of Houston

March 20, 2025

Preliminary (please do not circulate)

Abstract

This paper studies the nature of globalization and its effects on the US trade deficit. We build a quantitative model of international trade and financial integration that features time-varying frictions in the movement of goods and capital. By matching the observed volumes of *gross* trade and capital flows, the model allows us to identify the joint evolution of these two frictions. In a series of counterfactual experiments, we find that the reduction in trade costs is a prerequisite for trade and financial globalization and increases the trade deficit. On the other hand, financial integration reduces the trade deficit and the shocks affecting it can have persistent effects, while shocks to trade costs are more short-lived.

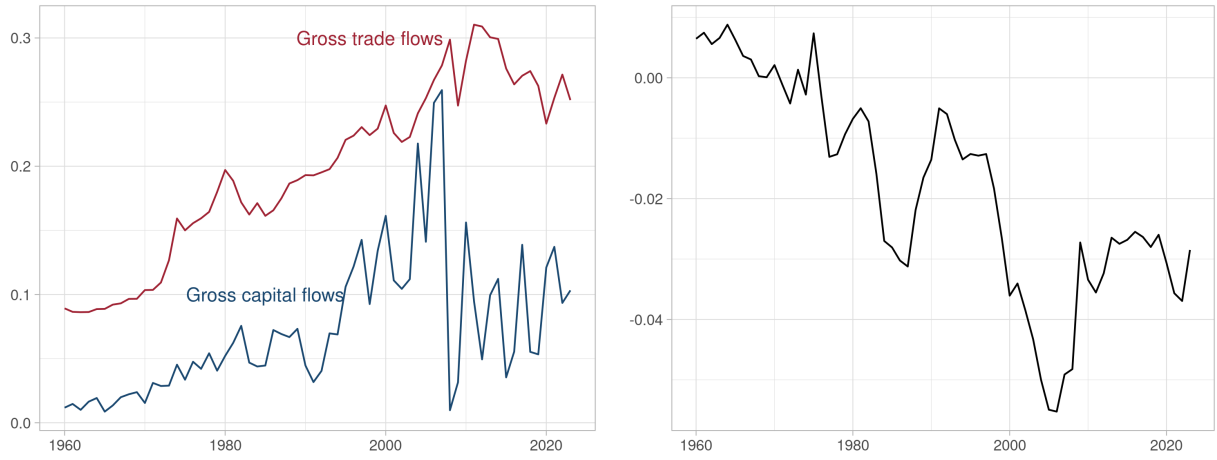
Keywords: Globalization, trade, capital flows, financial frictions.

JEL Classification Numbers: F15, F36, F41

*Corresponding author: Hyunju Lee (hlee73@uh.edu).

1 Introduction

Globalization has been a recurring phenomenon in the course of history, with multiple expansions and recessions going back to the ancient times. In no other period, however, has globalization reshaped the world economy as much as in the second half of the 20th century. Figure 1(a) shows that the volume of gross trade flows in the US increased 3-fold from 1960 until 2008, powered by the progress in shipping technologies and trade openness. In tandem with this trend, however, went *financial* globalization, with gross capital flows increasing by over 20-fold in the half century until 2007. As much as rising trade requires larger payments to cross national borders, so too does financial liberalization create new opportunities for trade. Under the hood of rising trade and capital flow volumes, individual economies also accumulated significant imbalances in net exports and current account (Figure 1(b)), raising concerns about a risk of financial crises or political instability. In this paper, we develop a quantitative framework to uncover the drivers of globalization and their impact on trade imbalances.



(a) Gross trade and capital flows to GDP

(b) Net exports to GDP

Figure 1: Trade and capital flows for the United States

We build a model of international trade and financial integration to study the joint dynamics and effects of trade costs and financial frictions. We use the observed series of gross trade and capital flows (as depicted in Figure 1) to identify the evolution of the two frictions in our model. The model is also designed to match the trade balance of the US which allows us to shed some light on the sources of rising imbalances in the world economy. Through a series of counterfactual experiments, we find that the reduction in trade costs is a primary driver of the increase in trade volume and a necessary prerequisite for

financial globalization. Trade costs also influence the US trade deficit by expanding it. On the other hand, financial liberalization acts in the opposite direction by reducing the trade deficit. We also find that, because of their inherent dynamic nature, shocks to financial frictions tend to have long-lasting effects, while the impact of trade cost shocks is more short-lived.

Our model features two countries, two tradable goods, and two risk-free bonds denominated in each country's currencies, subject to international trade and financial frictions. The standard risk sharing motive induces households to trade goods and bonds internationally because they would like to smooth out their consumption in the face of uncertain output. The key innovation in this paper is to introduce *gross* capital flows to a model of international trade and map them directly to their data counterparts. The gross positions are determined as households choose to simultaneously invest in foreign bonds (save) and issue domestic bonds (borrow). These gross positions provide a cross-border risk sharing mechanism because of endogenous movements in the real exchange rate that correlate the households' net wealth with their (net) import demand. In other words, households are rewarded with high returns on these gross positions precisely when they have high import demand.

To see how the gross trade flows and financial positions are intertwined via the risk sharing mechanism in the model, consider two extreme cases: zero goods trading and financial autarky. If trade costs are high then no goods are traded internationally (static effect) and international bonds are of no use as well because there are no imports to finance (dynamic link). On the other hand, in the case of financial autarky households can still trade goods across the border but no bonds are traded internationally (static effect). However, the lack of risk sharing eventually feeds back to aggregate trade volumes as fewer bond redemptions imply less imports (dynamic link). This inherent dynamic interaction makes it important to consider the joint evolution of trade costs and financial frictions in determining the households' optimal decision. As trade globalization unfolds, households increase the value of cross-border bond positions to acquire an adequate degree of hedging, leading to financial globalization. Similarly, with lower barriers to cross-border financial transactions, we observe a potentially larger quantity of goods traded and less volatile consumption over time. Ultimately, it is the goal of the quantitative implementation of our model to identify the joint evolution of these underlying frictions over time by matching the observed volumes of trade and capital flows.

We bring our model to the data by jointly targeting the series of gross trade flows, gross financial positions, and the net exports of the US from 1973 until 2023. Our quantitative approach is related to the algorithm of Chari, Kehoe and McGrattan (2007). We specify a joint stochastic process for the evolution of trade costs and financial frictions, as well as a separate process for the foreign output (needed to match the net exports). For a given set of parameters of these processes, we solve our model and iterate over the sample periods to find the sequences of these three shocks for which our model matches the gross trade flows, the gross financial positions, and the net exports of the US *exactly*. We then reestimate the parameters of the stochastic processes and repeat this procedure iteratively to maximize the likelihood of observing the matched series. The resulting series of trade costs and financial frictions are intuitive: starting at high levels in an initially fragmented world, both frictions decline until the height of globalization around 2007. Since then, the trends reverse and the uncovered variables are affected by shocks that align well with specific historical events such as the global financial crisis or the Covid-19 pandemic.

We use our model to conduct a number of counterfactual experiments. First, we fix the trade cost only at its 1973 level and generate predictions for all endogenous variables. When trade costs do not fall, globalization as we know it does not take place. Both the gross trade volumes and the gross financial positions remain diminished throughout the sample period. On the other hand, the US trade deficit is reduced by about 1-2 percentage points, but nevertheless follows its baseline path which is determined mostly by the shocks to output and the ability to hedge risk. Second, we fix the financial friction only at its initial level and run the similar counterfactual. In the absence of financial liberalization, the expansion in goods trade still occurs thanks to the decline in trade costs, while gross financial positions remain low. While not affecting the overall volume of trade by much, the lack of financial integration has significant impact on the US trade deficit, increasing it by up to 0.4 percentage point. This implies that the financial globalization has the opposite effect on trade deficit compared to trade globalization. Through additional exercises, we also find that even small shocks to financial integration tend to have persistent effects, while the shocks to trade costs tend to last for a shorter time.

Finally, we use our model to conduct scenario-simulation exercises for the effects of the 2024 US Presidential election campaign promises. Specifically, we translate the policy platforms of the candidates into a shock to one of the frictions in our model. In our interpretation, Donald Trump's proposal of imposing a minimum 10% tariff on all imports into the US would materialize as a hike in trade costs. Kamala Harris, showcasing her record

of having “taken on" Wall Street banks, would bring about a rise in financial frictions. We simulate our model forward to generate the predictions for the future of globalization and the US trade deficit. We find that the two scenarios produce a similar long term effect of an increased trade deficit, however they are a product of different forces acting via the changes in net wealth. We also conduct an experiment of a permanent regime change from Globalization to Fragmentation in which both frictions begin to slowly trend upwards. With trade and financial integration in gradual reverse, we find that the trade deficit shrinks on impact but in the long run once again it converges to the one predicted under the baseline scenario.

Literature Review This paper contributes to the growing literature on international trade and financial integration, and global imbalances. Mendoza, Quadrini, and Rios-Rull (2009) argue that imbalances can arise with financial integration under improved financial development. Bai and Zhang (2012) point out that financial liberalization need not lead to improved risk sharing if contracts cannot be easily enforced. Hu (2023) investigates asset allocation in a DSGE model with trade and financial linkages across many countries. She finds that asset portfolios are heavily influenced by financial frictions. However, as shown by Fitzgerald (2012), both frictions in international asset markets and trade costs significantly impede optimal consumption risk sharing. As a result, recent literature has shown the impact of trade costs on trade deficits and net financial positions. For instance, Reyes-Heroles (2016) uses a quantitative multi-country trade model in which trade imbalances arise endogenously to shows that the decline in trade costs over time has resulted in larger trade imbalances. Sposi (2022) argues that demographic structure is important in accounting for countries' trade and capital flows. Kleinman, Liu, Redding, and Yogo (2025) add trade and capital market frictions to otherwise standard neoclassical growth model and compute its transition to the steady state. Waugh and Ravikumar (2016) identify the unobserved trade frictions by measuring the countries' openness in a multicountry trade model. We add to this literature by incorporating gross financial flows and financial frictions.

Additionally, this paper contributes to the literature on the impact of financial frictions on gross and net trade. Manova (2013) shows theoretically and empirically that domestic financial friction can have significant impact on the volume of trade. Our paper focuses on international instead of domestic financial frictions, and investigates the impact of such frictions on trade. Recent literature on this topic includes Alessandria, Bai and Woo (2023). Using a multi-country model with business cycle shocks, trade barriers and finan-

cial frictions, the authors find that a reduction in financial frictions impacts the volatility of net capital flows but not gross trade and financial flows. In comparison, our model incorporates domestic and foreign denominated assets instead of a single bond. As a result, we find evidence that a reduction in financial frictions can actually lead to a decrease in the volatility of net capital flows.

The mechanism by which gross positions arise endogenously in our model closely follows Lee (2024). She develops a theory in which gross capital flows are driven by financial frictions and risk-sharing. We build on this work by incorporating trade cost shocks.

In addition to the above mentioned additions to the existing literature, our paper has a methodological contribution to the business cycle accounting literature. Pioneered by Chari, Kehoe and McGrattan (2007), qualitative models are utilized to back out unobserved time-varying wedges by exactly matching observed data. This approach has been applied to study international trade or financial flows separately. For instance, Atkeson, Heathcote and Perri (2023) investigate the drivers behind changes in US net assets by matching flows, stocks, and valuation of the US corporate sector but in a model without goods trade. Capelle and Pellegrino (2025) use a wedge accounting procedure in a spatial general equilibrium model to measure the heterogeneity in the patterns of financial globalization across countries. Jung (2020) utilizes a multi-country trade model with time-varying trade and financial frictions where the trade barriers are backed out to match trade flows but financial frictions are endogenously calibrated. Our paper backs out time-varying international trade and financial frictions simultaneously by exactly matching observed gross trade and capital flows.

Our model incorporates demand shock following the recent literature, especially in explaining the large and persistent current account deficit in the United States. Kehoe, Ruhl, and Steinberg (2018) introduces the saving glut, which is an increased demand for saving by the rest of the world, in addition to the structural change to explain the US trade balance. Our demand shocks are positively correlated with output shocks, in line with the recent paper by Bai, Rios-Rull, and Storesletten (2024) who provide a theory of demand shocks that have a productive role.

2 Model

In this section, we introduce our modeling framework. We first present the model of international trade and capital flows that largely builds on Lee (2024). Next, we strip the model down to a two-period version to establish some basic intuition for the two key mechanisms that we will use to identify the underlying frictions in trade and financial integration. Finally, we pose the infinite horizon model in a recursive form as we describe our solution method.

2.1 Physical environment

Time is discrete and goes up to infinity. In each time period, an exogenous vector of state variables $s_t \in S$ is realized following a Markov process described in the next subsection. Hence, the probability of a particular s_t draw depends only on its realization in the previous period (s_{t-1}), and the probability of such a transition is denoted as $\pi(s_t|s_{t-1})$.

The world consists of two countries, each populated by a continuum of identical households with measure 1 and endowed with a stream of uncertain realizations of its tradable good. For clarity, we will use Roman numerals (in superscript) to refer to the countries and I and II, and we will use letters b and m (in subscript) to refer to the goods produced in the two countries, respectively. For simplicity, the goods can be thought of as **b**ananas and **m**angoes, and their stochastic yields will be denoted as (y_b, y_m). Assuming that the law of one price holds for tradable goods, their market prices are denoted as (p_b, p_m).

Each country can issue and trade one-period risk-free bonds which represent a claim on an amount of their own final good. The investment positions of country i in the two bonds are denoted as (a^i_b, a^i_m) and the bond prices are (q_b, q_m).

Frictions There are time-varying frictions in the international trade of goods and financial assets. First, we assume an iceberg cost for shipping goods internationally where a fraction τ_t of the good melts down before it arrives. There is also a friction in trading bonds which can be though of as capital controls. Specifically, a household must pay a tax (or receive a subsidy) κ_t of the value of foreign bonds traded. The tax revenue collected is then rebated to each household in the form of a lump-sum payment.

Household's problem Each representative household is risk averse and demands a basket of bananas and mangoes. It has a recursive preference (Epstein and Zin, 1989) over

the total consumption basket with the risk aversion parameter γ, intertemporal elasticity of substitution ψ, and a discount factor $\beta < 1$. For the case of country I, the household's preference is

$$v_t^I = \left((1-\beta)\theta_t^I (c_t^I)^{1-1/\psi} + \beta \mathbb{E}_t \left[(v_{t+1}^I)^{1-\gamma} \right]^{\frac{1-1/\psi}{1-\gamma}} \right)^{\frac{1}{1-1/\psi}} \tag{1}$$

where θ_t^I is a taste shock that is assumed to be perfectly correlated with the domestic endowment as a form of power function, $\theta_t^I = y_b^2$. The final consumption good in country I, c_t^I, is a CES aggregate with an elasticity of substitution σ and home bias $\omega_b^I > 1/2$:

$$c_t^I = \left((\omega_b^I)^{\frac{1}{\sigma}} (c_{b,t}^I)^{\frac{\sigma-1}{\sigma}} + (\omega_m^I)^{\frac{1}{\sigma}} (c_{m,t}^I)^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} \tag{2}$$

The household chooses investment positions $\{a_{b,t+1}^I, a_{m,t+1}^I\}$ and consumption amounts $\{c_{b,t}^I, c_{m,t}^I\}$ to maximize its lifetime utility subject to the following budget constraint for each time period t:

$$p_{b,t} c_{b,t}^I + \frac{e_t p_{m,t}}{1-\tau_t} c_{m,t}^I + a_{b,t+1}^I q_{b,t} + \Big(1 + \kappa_t \cdot sign(a_{m,t+1}^I)\Big) e_t a_{m,t+1}^I q_{m,t} = p_{b,t} y_{b,t} + a_{b,t}^I + e_t a_{m,t}^I + T_t^I \tag{3}$$

In equation (3), e_t is the real exchange rate defined as the price of country 2 final good in units of country 1 final good. The lump-sum transfer T^I is equal to the tax revenue (or subsidy) on foreign bond transactions:

$$T_t^I = \kappa_t \cdot sign(a_{m,t+1}^I) e_t a_{m,t+1}^I q_{m,t}. \tag{4}$$

The household faces a borrowing constraint imposed on the total amount of debt:

$$a_{b,t+1}^I \mathbb{1}_{\{a_{b,t+1}^I < 0\}} + e_t a_{m,t+1}^I \mathbb{1}_{\{a_{m,t+1}^I < 0\}} \geq \bar{A}^I. \tag{5}$$

In the quantitative analysis, these borrowing constraints are calibrated so that they do not bind in equilibrium. The problem of the household in country II is symmetric. Finally,

price indices are defined as a standard CES price aggregator:

$$1 = \left(\omega_b^I (p_{b,t})^{1-\sigma} + \omega_m^I \left(\frac{e_t \, p_{m,t}}{1-\tau_t} \right)^{1-\sigma} \right)^{\frac{1}{1-\sigma}} \tag{6}$$

$$1 = \left(\omega_b^{II} \left(\frac{p_{b,t}}{e_t(1-\tau_t)} \right)^{1-\sigma} + \omega_m^{II} (p_{m,t})^{1-\sigma} \right)^{\frac{1}{1-\sigma}} \tag{7}$$

Market clearing In each period, all goods and financial asset markets must clear. In other words, the total yield of each good is equal to the domestic consumption of that goods and the exported amount, while there is zero net supply for each bond. The following are the four market clearing conditions:

$$y_{b,t} = c_{b,t}^I + \frac{c_{b,t}^{II}}{1-\tau_t} \tag{8}$$

$$y_{m,t} = \frac{c_{m,t}^I}{1-\tau_t} + c_{m,t}^{II} \tag{9}$$

$$0 = a_{b,t+1}^I + a_{b,t+1}^{II} \tag{10}$$

$$0 = a_{m,t+1}^I + a_{m,t+1}^{II} \tag{11}$$

2.2 Two Period Model

Before proceeding to the full quantitative results, we first strip our main model down to a simplified two-period version in order to present the key intuition. Consider the environment described in Section 2.1 with two periods only, indexed $t = 1, 2$. In period $t = 1$, goods endowments are pre-determined. The only source of uncertainty comes from stochastic realizations of the two goods in period $t = 2$ (which also determine the countries' demand shocks). The financial friction in the first period and the trade cost in the second period are assumed to be fixed (for simplicity there are no trade costs in $t = 1$). Each country starts with zero initial positions in period $t = 1$, and each country must choose zero positions in period $t = 2$; hence the only active investment choice occurs in the first period. We also assume that risk aversion is equal to an inverse of the intertemporal elasticity of substitution ($\gamma = 1/\psi$), which makes the preference equal to a time-separable Constant Relative Risk Aversion (CRRA) utility. This is a special case of the recursive preferences we use in our main analysis of the infinite horizon framework. To characterize this simplified variant of the model, we work out the problem backwards.

Second period In period $t = 2$, the representative agent in country I solves the following problem (the problem for the agent in country II is analogous):

$$\max_{c^I_{b,2}, c^I_{m,2}} \ \theta^I_2 \, u(c^I_2)$$

$$s.t. \ \ p_{b,2} c^I_{b,2} + \frac{e_2 p_{m,2}}{1-\tau} c^I_{m,2} = p_{b,2} y_{b,2} + a^I_{b,2} + e_2 a^I_{m,2} \tag{12}$$

First period In period $t = 1$, the representative agent in country I solves the following problem

$$\max_{c^I_{b,1}, c^I_{m,1}, a^I_{b,2}, a^I_{m,2}} \ u(c^I_1) + \beta \mathbb{E} \, \theta^I_2 u(c^I_2)$$

$$s.t. \ \ p_{b,1} c^I_{b,1} + e_1 p_{m,1} c^I_{m,1} + a^I_{b,2} q_b + \Big(1 + \kappa \cdot sign(a^I_{m,2})\Big) e_1 a^I_{m,2} q_m = p_{b,1} y_1 + T^I_1 \tag{13}$$

$$p_{b,2} c^I_{b,2} + \frac{e_2 p_{m,2}}{1-\tau} c^I_{m,2} = p_{b,2} y_{b,2} + a^I_{b,2} + e_2 a^I_{m,2} \tag{14}$$

Analysis Notice that our assumptions for this model variant imply that the two countries are perfectly symmetric in period $t = 1$. Hence, the countries must choose symmetric positions $a^I_{b,2} = -a^I_{m,2} \equiv a^I$, which further implies that the bond prices are symmetric, $q_b = q_m \equiv q$, and the real exchange rate in that period is $e_1 = 1$. To build further intuition, we can use this characterization to further simplify the budget constraints as follows

$$p_{b,1} c^I_{b,1} + p_{m,1} c^I_{m,1} - a^I q \Big(1 + \kappa \cdot sign(a^I)\Big) a^I q = p_{b,1} y_1 + T^I_1 \tag{15}$$

$$p_{b,2} c^I_{b,2} + \frac{e_2 p_{m,2}}{1-\tau} c^I_{m,2} = p_{b,2} y_{b,2} + a^I (e_2 - 1) \tag{16}$$

Equation (16) reveals an important insight. The agent's *net wealth* in period $t = 2$, which automatically determines the country's *net imports*, is given by the product of the gross foreign position a^I and the real exchange rate in that period. We can rewrite this identity as follows

$$a^I = \frac{\text{net imports}}{e_2 - 1} = \frac{\frac{e_2 p_{m,2}}{1-\tau} c^I_{m,2} - p_{b,2}(y_{b,2} - c^I_{b,2})}{e_2 - 1} \tag{17}$$

To insure against the sources of uncertainty in the second period, the country's optimal gross foreign position is such that they can afford the net imports adjusted for the endogenous movement of the real exchange rate. This insight is important to understand the signs of the optimal gross positions in the model equilibrium.

2.2.1 Mechanism 1: dynamic interactions of τ and κ

The first key mechanism of our model shows how we can use the observed data on gross trade flows and gross financial positions to jointly identify the underlying trade and capital market frictions. This mechanism is illustrated in Figure 2. On the left-hand side panel, a higher iceberg trade cost parameter τ leads to lower gross trade volumes in period $t = 2$. Similarly, on the right-hand side panel, a higher capital control parameter κ leads to reduced gross financial positions in period $t = 1$. These results are intuitive and reveal the *static effects* of trade costs and financial frictions. Because the two frictions make goods and asset trading more expensive, agent do less of it.

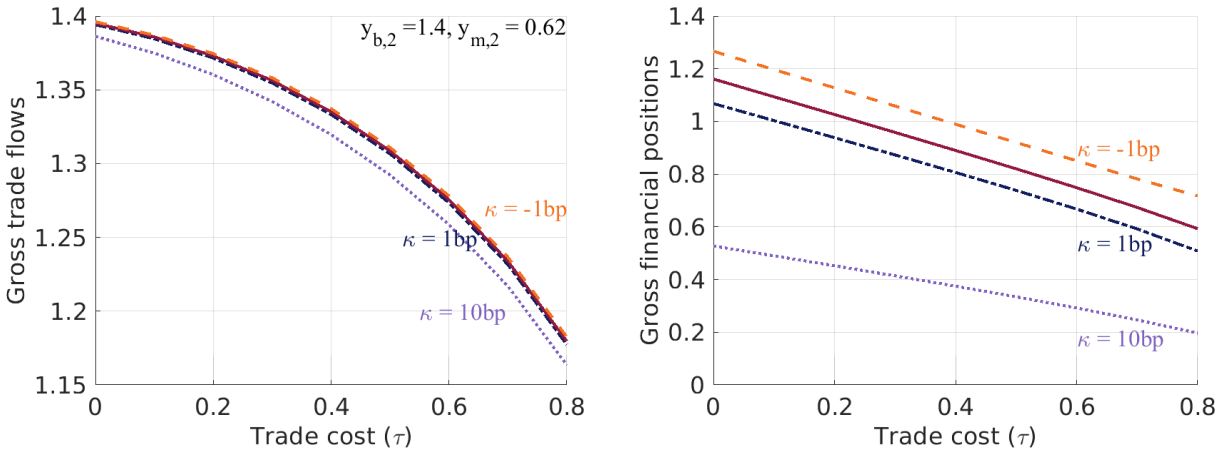


Figure 2: Gross trade flows and gross financial positions in the simplified model

Figure 2 also reveals the *dynamic interaction* between the two frictions. On the left-hand side panel, a higher capital control parameter in period $t = 1$ reduces future gross trade flows for any value of τ, while on the right-hand side panel, a higher trade cost parameter in period $t = 2$ reduces initial gross financial positions for any value of κ. This interaction materializes because, on the one hand, higher trade costs impede the benefit from risk sharing as the countries are less able to execute the trades required to settle their respective claims. On the other hand, higher financial frictions discourage the two countries from exchanging claims which leads to a lower volume of goods traded next period due to fewer redemptions of the bonds. The dynamic interaction between τ and κ is precisely the reason why their values can only be identified jointly from the observed volumes of trade and capital flows.

2.2.2 Mechanism 2: determination of gross positions

We now turn to our second key mechanism which determines the sign and magnitude of the gross financial positions. Suppose that the demand shock each country i receives is modeled as $\theta^i = y_{i,2}^{\alpha}$, i.e. it is correlated with the country's endowment realization, with a power parameter α. Figure 3 shows that for low values of α (in particular, when it is zero), low realizations of domestic endowment lead to an appreciation of the real exchange rate (because domestic good is scarce and its relative price increases). Furthermore, because the two goods are assumed to be gross substitutes ($\sigma\gamma > 1$), a low endowment realization leads to positive net imports due to the substitution effect. By formula (17), it then follows that the country optimally chooses its foreign bond holdings to be *negative*. In other words, each country will save in domestic bonds and simultaneously borrow in foreign bonds.

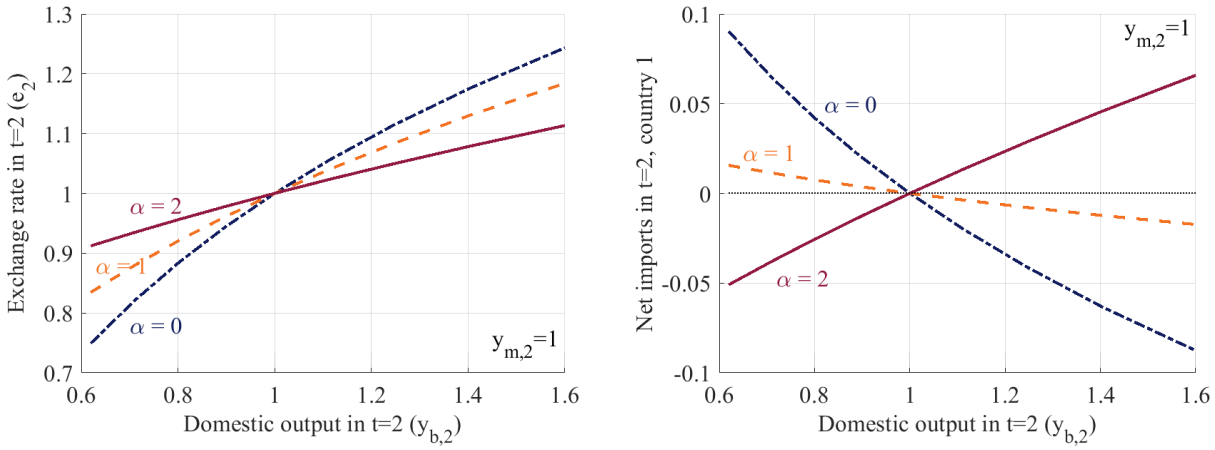


Figure 3: Determinants of optimal gross foreign position in the simplified model

Now, suppose that the power parameter α takes a high enough value, for example 2 as in Figure 3. By analogous logic, a low realization of domestic endowment leads to appreciation of the exchange rate. However, this realization is now also correlated with a low demand shock. As a result, rather than being a net importer, the country exports more of its own good than it imports the foreign one. With net imports turning negative, similar to $e_2 - 1$, the country will now also choose a *positive* foreign bond holding by the logic of formula (17). In other words, each country will borrow in domestic bonds and simultaneously save in foreign bonds.

These results are further summarized in Figure 4 which plots the optimal foreign bond po-

sition a as function of the demand shock power parameter α. For low values, the optimal position is negative which implies borrowing in foreign bonds. For the power parameter above the value of around 1.2, the optimal position turns positive which implies saving in foreign bonds.

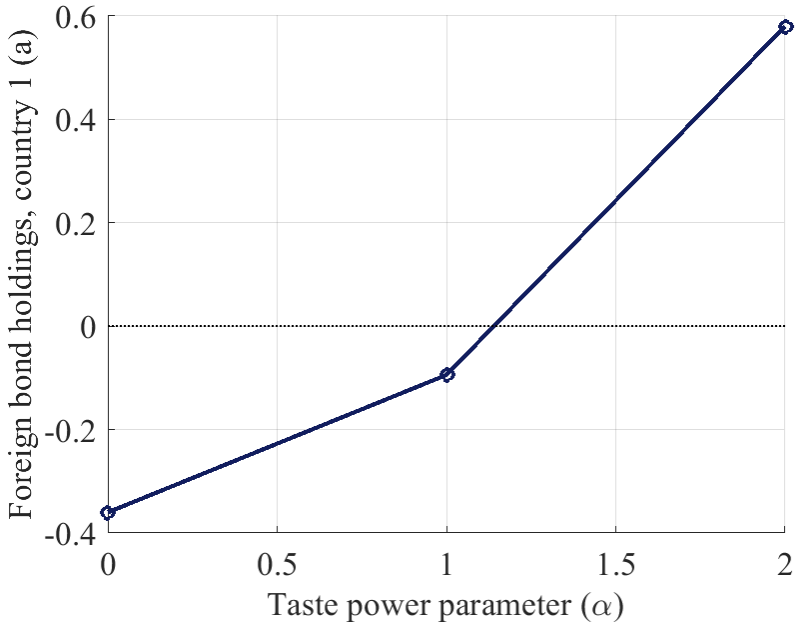


Figure 4: Optimal foreign bond holding in the simplified model

Which of these two cases is more relevant empirically? Figure 5 plots the share of assets and liabilities of the United States denominated in its own currency (USD) over time. It is immediate to notice that over 80% of US liabilities are denominated in the dollar, and this share is stable over time. On the other hand, historically less than half of US assets are denominated in USD and the share has been falling, recently dropping to as low as 30%. With this mechanism and the evidence in hand, we will next calibrate our main infinite horizon model to feature a negative domestic gross position, and a positive foreign gross position.

2.3 Recursive formulation

Exogenous states There are five exogenous states in this economy, which can be divided into two groups. The first set is output shocks for each country, $y_t = (y_{b,t}, y_{m,t})$, which

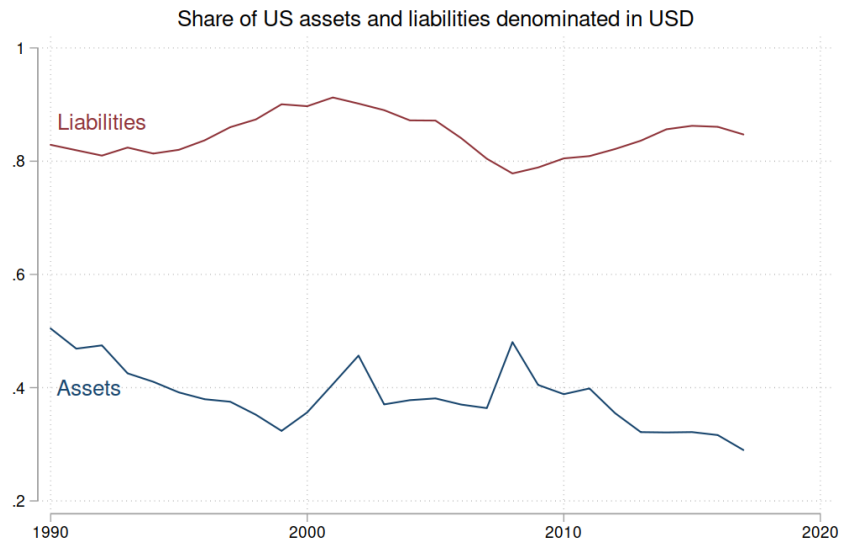


Figure 5: Share of US assets and liabilities denominated in USD

follow a joint log normal AR1 process:

$$\log y_t = \rho_y \log y_{t-1} + \varepsilon_t \tag{18}$$

where $\varepsilon_t = (\varepsilon_{b,t}, \varepsilon_{m,t}) \sim \mathcal{N}(0, \Sigma_y)$, *i.i.d.*

The second group consists of a binary regime variable $\xi_t = \{\xi_H, \xi_L\}$ that follows Markov chain, and trade costs (τ_t) and financial frictions (κ_t) that follow a joint regime-switching AR1 process. We assume that there are two regimes — the "High" regime (ξ_H) represents the economy where trade and financial frictions are high, whereas the "Low" regime (ξ_H) resembles globalization with low trade and financial frictions. The regime can switch following a Markov chain process, and each regime dictates the mean of trade and financial frictions $\mu(\xi) = (\mu_\tau(\xi), \mu_\kappa(\xi))$. In order to ensure that trade costs are contained between 0 and 1 while corresponding shocks are unbounded, we impose a functional form such that $\tau_t = exp(-exp(\tilde{\tau}_t))$ and $\tilde{\tau}_t$ follows a regime-switching log normal AR1 process. We allow financial frictions κ_t to be negative by assuming a regime-switching AR1 process on κ_t itself. Formally,

$$\tilde{\tau}_t = (1 - \rho_\tau)\mu_\tau(\xi_t) + \rho_\tau \tilde{\tau}_{t-1} + v_{\tau,t} \tag{19}$$

$$\kappa_t = (1 - \rho_\kappa)\mu_\kappa(\xi_t) + \rho_\kappa \kappa_{t-1} + v_{\kappa,t} \tag{20}$$

where $v_t = (v_{\tau,t}, v_{\kappa,t}) \sim \mathcal{N}(0, \Sigma_{\tau\kappa})$, *i.i.d.*

In the following, we denote the entire set of exogenous states as $s_t = (y_{b,t}, y_{m,t}, \xi_t, \tau_t, \kappa_t)$.

Net wealth: single endogenous state For an individual household i in country I, the (normalized) net wealth $w(i, s_t)$ is defined as the total cash-in-hand over the world output:

$$w(i, s_t) = \frac{p_b(s_t)y_b(s_t) + a_b^I(s_t) + e(s_t)a_m^I(s_t)}{p_b(s_t)y_b(s_t) + e(s_t)p_m(s_t)y_m(s_t)} \tag{21}$$

All households are symmetric within each country. By aggregating up the individuals, we get the single endogenous state W:

$$W(s_t) = \int_{i\in[0,1]} w(i, s_t)di \tag{22}$$

In other words, the endogenous state is the country I's net wealth plus its output over the total world GDP. Notice that when two countries are perfectly symmetric, the "ergodic steady state" of the net wealth will be $1/2$. Also, due to the zero net supply of bonds, country I's net wealth is a sufficient statistic for the entire world.

Evolution of net wealth Each individual household forms rational expectations about the evolution of aggregate net wealth. Given the current state s_t, there is a mapping Γ from any pair of the current net wealth and future state, $(W(s_t), s_{t+1})$, to the future net wealth $W(s_{t+1})$:

$$W(s_{t+1}) = \Gamma\left(W(s_t), s_{t+1}; s_t\right) \tag{23}$$

Combining the rational expectations about the evolution of aggregate net wealth and the definition of individual net wealth, the following should hold in equilibrium for any pair of states (s_{t+1}, s_t), given the equilibrium policy functions:

$$W(s_{t+1}) = \frac{p_b\left(W(s_{t+1}), s_{t+1}\right) y_b(s_{t+1}) + a_b^I\left(W(s_t), s_t\right) + e\left(W(s_{t+1}), s_{t+1}\right) a_m^I\left(W(s_t), s_t\right)}{p_b\left(W(s_{t+1}), s_{t+1}\right) y_b(s_{t+1}) + e\left(W(s_{t+1}), s_{t+1}\right) p_m\left(W(s_{t+1}), s_{t+1}\right) y_m(s_{t+1})} \tag{24}$$

Also, in equilibrium, individual net wealth is equal to the aggregate net wealth by symmetry: $w(i, s_t) = W(s_t)$, $\forall(i, s_t)$.

Recursive form of HH problem in country I Formally, a recursive form of the household I's problem is:

$$V^I(w;W,s) = \max_{c^I,a_b^I,a_m^I} \left((1-\beta)\theta^I(s)(c^I)^{1-1/\psi} + \beta \sum_{s'} \pi(s'|s) \left[\left(V^I(w';W',s') \right)^{1-\gamma} \right]^{\frac{1-1/\psi}{1-\gamma}} \right)^{\frac{1}{1-1/\psi}} \tag{25}$$

$$\begin{aligned} s.t.\ & c^I + q_b(W,s)a_b^I + \left(1+\kappa(s)\cdot sign(a_m^I)\right) e(W,s)q_m(W,s)a_m^I \\ & = w\cdot[p_b(W,s)y_b(s) + e(W,s)p_m(W,s)y_m(s)] + T(W,s) \qquad (26) \\ & a_b^I \mathbb{1}_{\{a_b^I<0\}} + e(W,s)a_m^I \mathbb{1}_{\{a_m^I<0\}} \geq \bar{A}^I \qquad (27) \\ & W' = \Gamma(W,s';s) \qquad (28) \\ & w' = \frac{p_b(W',s')y_b(s') + a_b^I + e(W',s')a_m^I}{p_b(W',s')y_b(s') + e(W',s')p_m(W',s')y_m(s')} \qquad (29) \end{aligned}$$

and country II is symmetric.

2.4 Solution

We solve for the policy functions globally, allowing for non-linear policy functions over a wide range of exogenous shock realizations. We start with an initial guess of policy functions and prices, update them by solving for a system of non-linear equations, and iterate until convergence.

Formally, we denote a set of endogenous state, policy functions, prices, and borrowing constraint slackness conditions (following Garcia-Zangwill 1981) in the k-th iteration as

$$\Omega(k) = \{W(k), c_b^I(k), c_m^I(k), a_b^I(k), a_m^I(k), p_m^I(k), p_b^I(k), e(k), q_b(k), q_m(k), \alpha^I(k), \alpha^{II}(k)\}.$$

Also, define a subset of Ω that excludes the endogenous variable W as $\tilde{\Omega}(k) = \Omega(k)/W(k)$. This subset contains policy functions and prices that are functions of endogenous variable W and exogenous state s. The solution follows the steps described below. For brevity, the endogenous and exogenous states (W,s) are suppressed in the following steps.

1. Set up the initial guess of $\tilde{\Omega}(0)$ and the grid of endogenous variable W.
2. Solve for the system of equations by setting $\tilde{\Omega}(k)$ as the initial guess.

3. Update $\tilde{\Omega}(k+1) = (1-\rho)\tilde{\Omega}(k) + \rho\hat{\Omega}$, where $\hat{\Omega}$ is the new set of policy functions and prices as a result of Step 2 and ρ is the update speed.

4. Stop if the maximum distance between the k-th and (k+1)-th policy functions is below the threshold. Otherwise, go back to Step 2.

System of equations For each grid of endogenous and exogenous states (W, s), we solve for the following system of non-linear equations. We suppress states for brevity.

$$\left(q_b^I - q_b^{II}\right)|a_b^I| = 0 \tag{30}$$

$$\left(q_m^I - q_m^{II}\right)|a_m^I| = 0 \tag{31}$$

$$p_b c_b^I + \frac{e p_m}{1-\tau} c_m^I + q_b a_b^I + e q_m a_m^I - W \cdot [p_b y_b + e p_m y_m] = 0 \tag{32}$$

$$\min\{a_b^I, 0\} + e * \min\{a_m^I, 0\} - \bar{A}^I - \max\{\alpha^I, 0\}^\zeta = 0 \tag{33}$$

$$\min\{-a_b^I, 0\}/e + \min\{-a_m^I, 0\} - \bar{A}^{II} - \max\{\alpha^{II}, 0\}^\zeta = 0 \tag{34}$$

The five unknowns are $\{c_b^I, a_b^I, a_m^I, \alpha^I, \alpha^{II}\}$. The system of equations are derived from the first order conditions, household I's budget constraint, and borrowing constraints for both countries. The first two equations characterize the law of one price for bond prices (q_b, q_m), conditional on the bond markets being formed. For example, the bond price for country 1 evaluated by household I, q_b^I, must be equal to that evaluated by household II, q_b^{II}, whenever there is a positive amount of holding in the market ($|a_b^I| > 0$). The third equation ensures that the budget constraint for the household I is met. Notice that by Walras's Law, household II budget constraint is also satisfied using market clearing conditions. In the last two equations for borrowing constraints, the Garcia-Zangwill parameter ζ is set to 2.

3 Quantitative Analysis

In this section, we bring the model to the data by picking some of its parameters from external sources and estimating the rest. As a crucial component, we conduct the main exercise of backing out the series of trade costs and capital controls that match the observed volume of trade and capital flows.

3.1 General approach

The core idea behind this paper is to use the information in the total volumes of gross trade and capital flows to infer the dynamics of trade costs and capital controls illustrated in Figure 1. To this end, we develop an algorithm that combines a Maximum Likelihood estimation of the parameters characterizing these stochastic processes, with an exercise that infers the paths of wedges as in Chari, Kehoe and McGrattan (2007). The main two wedges of interest, τ_t and κ_t, are complemented with the third one, $y_{m,t}$, the ROW endowment, the path of which is fitted to match the net trade balance between the two countries (in addition to the two series of gross flows which are pinned down by the first two wedges).

Algorithm Specifically, we start with a vector of initial guesses for the parameters $\{\bar{\iota}_H, \bar{\iota}_L, \rho_\iota, \sigma_\iota, \iota_0\}$ for $\iota \in \{\tau, \kappa\}$, as well as $\{p_{LH}, p_{HL}, p_0\}$. Given these parameter choices (along with an array of parameter values set externally), we solve for the policy functions of the model using a time iteration method that builds on Lee (2024). We then go over the time period 1973-2023 and for each year we back out a vector $\{\tau_t, \kappa_t, y_{m,t}\}$ such the model matches exactly the following data points:

- Gross trade flows to GDP
- Net exports to GDP
- Gross financial positions to GDP

Having backed out these series, we use a Maximum Likelihood method to update the estimates for the parameters of the stochastic processes driving them. We iterate on these parameter values until convergence.

Target Data Our main quantitative analysis is based on the United States against the Rest of the World over the time period 1973-2023. Trade and capital flows over GDP series are sourced from the International Transactions (ITA) data by the Bureau of Economic Analysis (BEA).

Two targeted series based on trade flows are straightforward. Gross trade flows to GDP is equal to the sum of exports and imports to GDP, while the net exports to GDP is the exports net of imports to GDP.

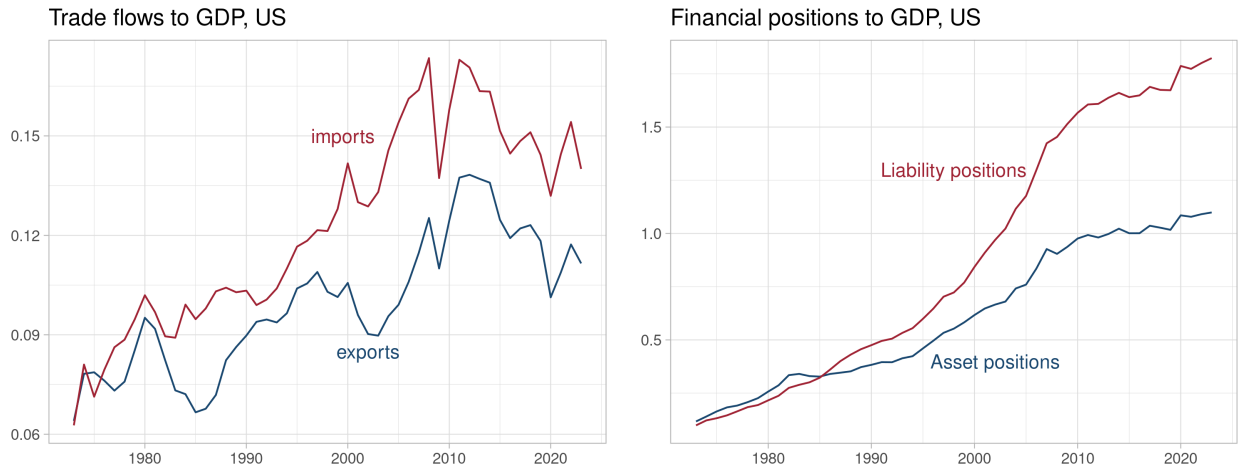


Figure 6: US data targets: trade flows and financial positions to GDP

The remaining targeted series, gross financial positions to GDP, is constructed as a cumulative sum of asset and liability flows (also known as outflows and inflows) over time. This approach focuses on the financial positions due to transactions, and does *not* include valuation effects. The reason for excluding valuation effects in designing the target data is twofold. First, in the US data, a majority of fluctuations in gross capital flows arise due to *debt* instruments such as bonds or bank loans, where valuation effects are limited compared to equities or direct investments. Second, motivated by these data observations, we abstract away from the international equity holdings and focus on the gross flows arising from bond transactions. If we include valuation effects as part of the data target, it would require adding equity transactions to the model, which would significantly complicate the model. Therefore, we leave the inclusion of valuation effects to future research.

Detrending The US GDP data we use to calibrate the model (as country I), as well as the ROW GDP that we use to compare against the model-generated one are non-stationary. We detrend them using a broken linear trend. Following the approach in Paluszynski (2023), we detect a statistically significant breakpoint using the Bai-Perron (Bai and Perron, 1998) test and impose continuity of the trend line. The estimated breakpoints are in years 2008 and 2006 for the case of the US and ROW, respectively. Figure 7 illustrates the obtained trend lines in both cases.

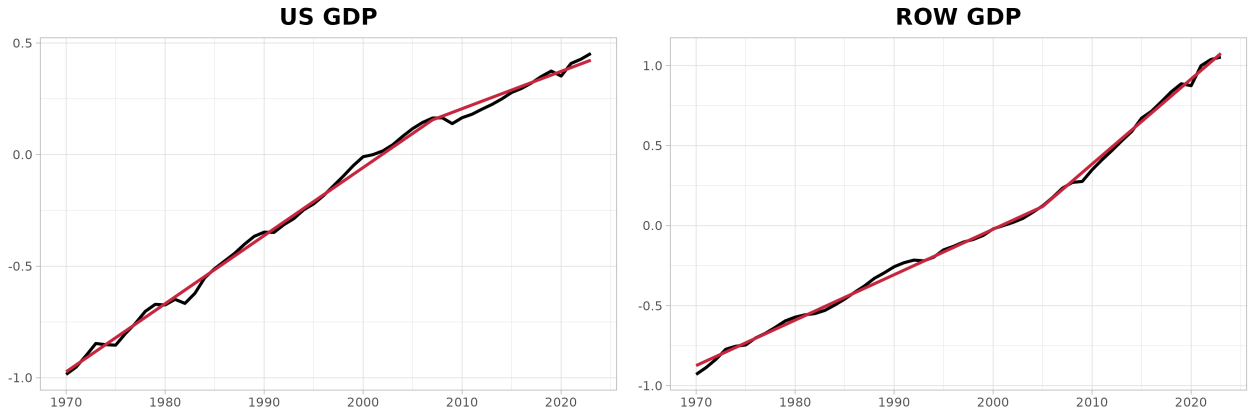


Figure 7: GDP series and their trends

3.2 Parameterization

We parameterize the model through a combination of external calibration and maximum likelihood estimation. Table 1 summarizes the fixed parameters that we pick from outside sources. The discount factor β and the risk aversion γ are set to the standard values of 0.98 and 2, respectively. The elasticity of substitution σ is set to 1.5 implying that the two goods are gross substitutes. The home bias parameters in both countries are set to 0.8 roughly following Lee (2024). Finally, the persistence and the standard deviation of innovations to the stochastic endowment in country I is estimated using the linearly detrended US real GDP data.

Table 2 summarizes the results of our maximum likelihood estimation procedure. We find that trade costs τ fluctuate between the unconditional means of 0.67 and 0.49, while capital controls κ take values around the means of 0.034% and 0.025%. Both processes are fairly persistent. The regime initially starts high and has a fairly low probability of

Table 1: Summary of externally selected parameters

Symbol	Meaning	Value	Source
β	Discount factor	0.98	Standard
γ	Risk aversion	10.00	Standard
ψ	Intertemporal elasticity of substitution	0.50	Standard
σ	Elasticity of substitution between goods	1.50	Standard
ω_b^I	Country I home bias	0.80	Literature
ω_m^{II}	Country II home bias	0.80	Literature
ρ_b	Persistence of country I income	0.70	} Estimated
σ_b	Innovation to country I income	0.02	

switching to the low one, at 10%. On the other hand, the probability of switching from low back to high is essentially negligible.

Table 2: Summary of estimated parameters

Symbol	Meaning	Value
$\bar{\kappa}_H$	High regime mean κ	0.0068
$\bar{\kappa}_L$	Low regime mean κ	0.0062
ρ_κ	Persistence κ	0.91
σ_κ	St. deviation κ	0.0004
$\bar{\tau}_H$	High regime mean τ	0.67
$\bar{\tau}_L$	Low regime mean τ	0.49
ρ_τ	Persistence τ	0.90
σ_τ	St. deviation τ	0.24
p_{LH}	Regime transition L to H	0.00043
p_{HL}	Regime transition H to L	0.10
κ_0	Initial κ	0.0068
τ_0	Initial τ	0.88
p_0	Initial high regime prob.	1.00

3.3 Results

The main quantitative analysis recovers three wedges in the model – trade costs, financial frictions, and the relative output (demand) – implied by the target data series, namely gross trade flows, gross financial positions, and net trade balance. It should be emphasized that these recovered series are the result of solving a large system of fixed points. Specifically, the *Globalization regime* (ξ) is a hidden state to an econometrician, which governs the trade costs and financial frictions. Therefore, we must start from an initial guess of the regime over time as part of the Maximum Likelihood Estimation, and iterate until its convergence. Moreover, the single endogenous state, net wealth, is solved for each period as a fixed point. Given the previous period's bond positions and using the policy functions and prices, we solve for the net wealth that satisfies equation (24) off the grid points. Finally, in order to exactly match the target time series, we start with an initial guess of three wedges in each period, solve for the net wealth given the wedges, and update based on the differences between target moments until the distances are below the threshold.

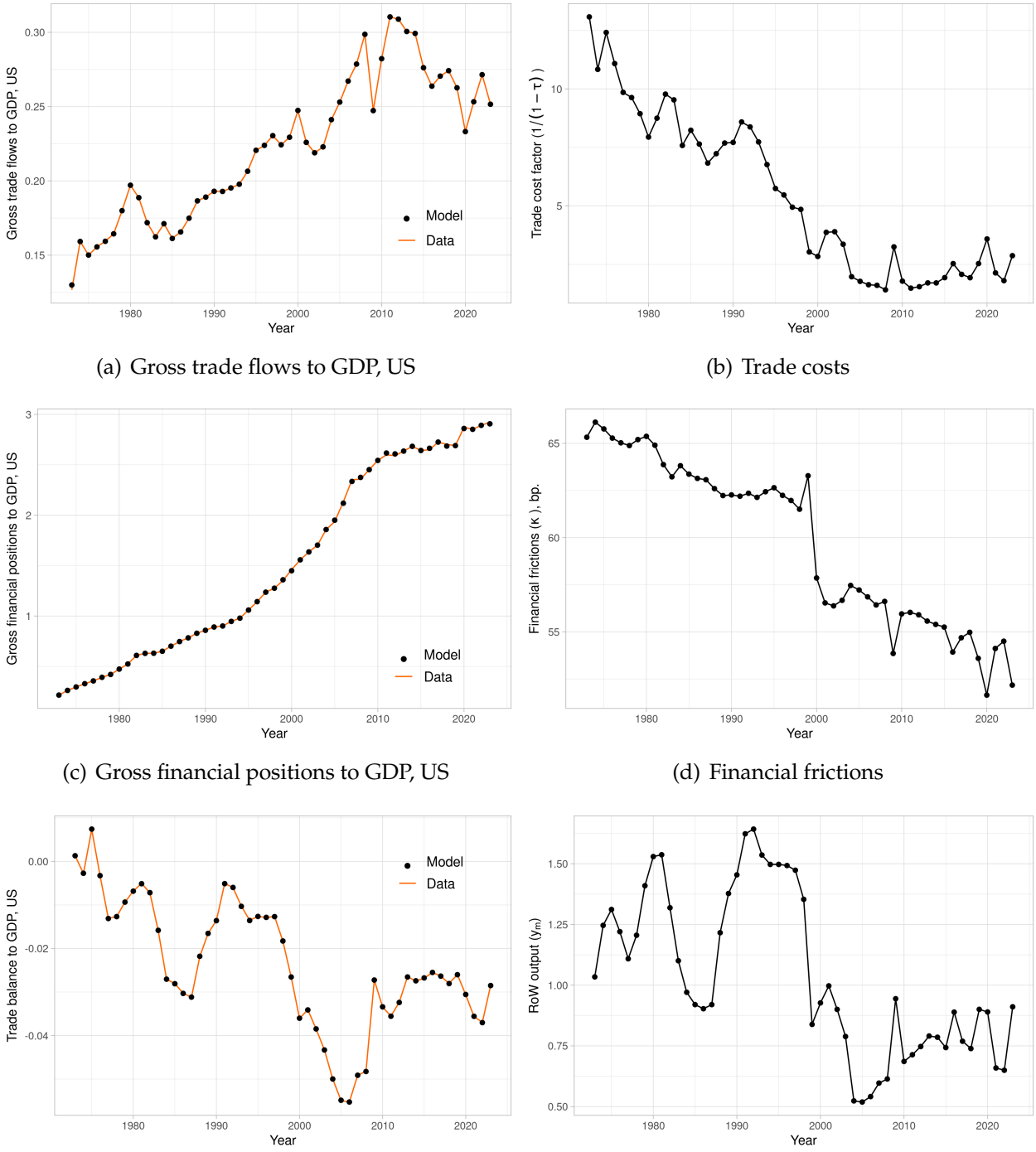
Figure 8 summarizes three recovered series on the right column and compares the tar-

get data and corresponding model moments on the left column. While the three wedges jointly match the three data observations each year, each row in the figure connects the target data series with the recovered wedge that has the highest correlation.

The backed out trade costs strongly correlates with the observed gross trade flows. Between 1970 and 2008 trade flows more than doubled. In tandem, trade costs drastically decreased, resulting in larger imports and exports. In the data it is noticeable that trade flows decrease strongly during recessions, such as the 2001 dotcom bubble, the Great recession in 2009 and the Covid pandemic in 2020. In corresponding fashion, trade costs spike during these time periods. Although trade volumes recovered after the Great Recession, US trade flows have experienced a downward trend. As a result, our measure of trade costs indicate that trade barriers in 2022 have almost reverted back to 2003 levels.

International financial barriers are modeled as a wedge in the return offered to foreign and domestic households. The backed out series for financial frictions is positive, meaning that foreign bond holders receive a lower return on assets and pay a higher interest rate on debt. This disincentives holding assets in the foreign currency and leads to smaller gross positions. Our measure of financial frictions strongly decreased from almost 3.5 basis points (bp) in 1980 to less than 2 bp in 2020, in correspondence with the strong increase in the gross financial position.

However, the correlation between gross positions and financial frictions is not one-to-one. This is because trade costs directly impact the household's incentives to hold a large gross position. As households borrow in the domestic currency and save in the foreign currency, a depreciation of its currency improves the financial position of the household. The co-movement between the real exchange rate and output shocks allows households to reduce risk by saving in one currency and borrowing in another. When trade costs decrease, the exchange rate reacts more strongly to output shocks, enhancing the risk-sharing motivation of larger gross positions. As a result, any reduction in trade costs increases the gross financial position even if financial frictions remain unchanged. Therefore, the decrease in trade costs during the 1970-2008 period also drives the increase in gross positions. For instance, between 1980 and 1995 the gross position more than doubles but financial frictions only decreased slightly. During other periods the increase in gross positions is driven by a strong reduction in financial frictions. For instance, during the period leading up to the 2007 financial crisis. During the 2009 Great Recession and Covid pandemic financial frictions sharply decreased. This surprising result is driven



(a) Gross trade flows to GDP, US

(b) Trade costs

(c) Gross financial positions to GDP, US

(d) Financial frictions

(e) Trade balance to GDP, US

(f) Output, RoW

Figure 8: Targeted series and uncovered shocks

by the combination of the strong increase in trade barriers but increase in gross financial positions. As the increase in trade costs incentives households to unwind their gross position, financial frictions must decrease in order to counteract this mechanism. As trade

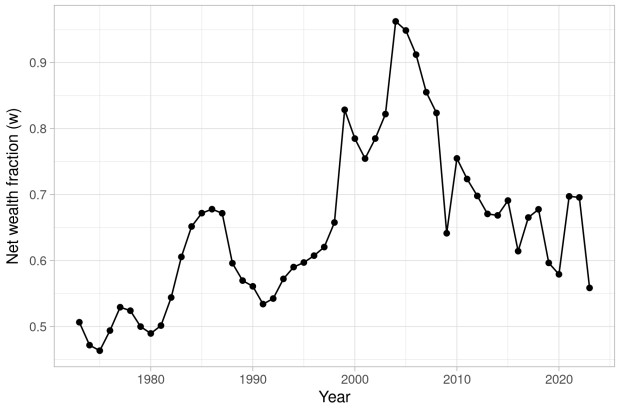
barriers increased sharply in 2009 but the gross financial position increased, the estimated financial barriers actually sharply decrease.

The backed out series for foreign output shocks strongly follows movements in the US trade balance. In our model, a positive shock results in an increase in supply as well as demand. Hence, a positive output shock in the RoW increases demand for US export goods. Additionally, foreign shocks have little impact on the share of income spend on imports. As a result a positive foreign shock has a positive impact of US net trade whereas a negative shock deteriorates the trade balance. Over time the trade balance of the US has heavily deteriorated. In order to match this imbalance in net savings, foreign output tends to be higher between 1970-2000 and lower in the second half of the time period of interest.

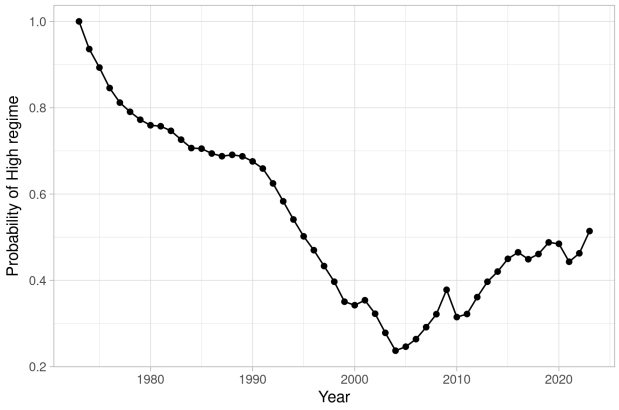
Next, Figure 9 presents important non-targeted series generated by our model. We assume the economy in 1973 starts in the regime with high trade and financial frictions. The probability of being in the regime with large frictions is an endogenous object and has no direct data counterpart as the probability of globalization is unobserved. The probability of the being in the high regime is calculated based on the backed out series for trade and financial frictions. The probability of globalization increases sharply in the early 1980s before decreasing in the late 1980s. This pattern resembles the backed out financial frictions. As trade costs and financial frictions decrease between 1990 and the early 2000s, the economy moves to the low regime. Given the sharp increase in trade costs during the Great Recession, the probability of moving to the high regime increase. Even though trade costs experience an upward trend after 2009, the probability of the low regime remains high on the back of low financial frictions.

The main driver of real exchange rate fluctuations is output shocks. Given that foreign output shocks are strongly related to trade balance movements, the real exchange rates closely resembles changes in the trade balance. When the RoW experiences a positive output shock, the price of the foreign good decreases as the increase in supply outpaces the increase in domestic demand. The real exchange rate, reflecting the relative price of foreign to domestic goods, appreciates as a result. Hence, the exchange rate is almost the mirror image of foreign output shocks.

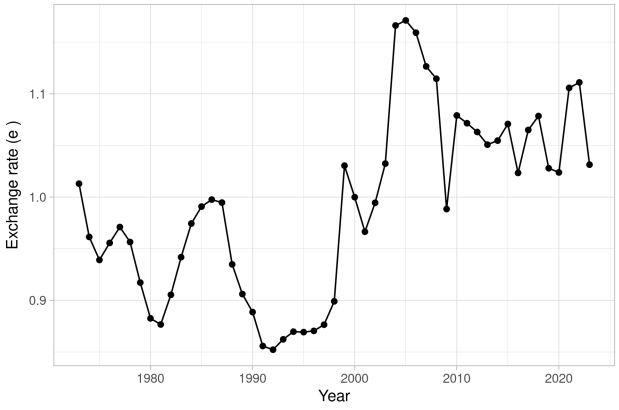
While the model exactly matches gross financial positions, it does not perfectly align with the *net* positions in the data. Compared to the data, the model policy functions result in higher asset positions and lower liability positions. It is partly due to the fact that the



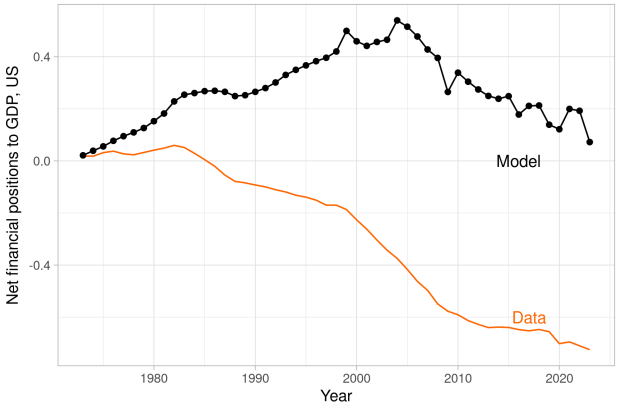
(a) Net wealth



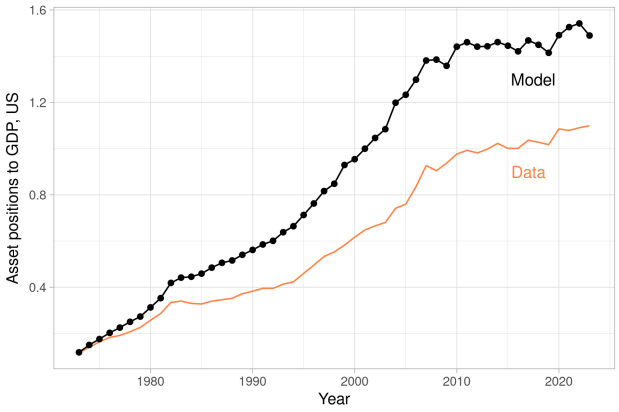
(b) High regime probability



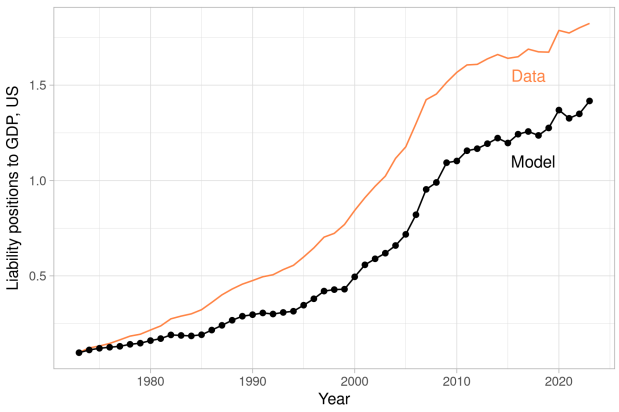
(c) Real exchange rate



(d) Net financial positions



(e) Asset positions to GDP



(f) Liability positions to GDP

Figure 9: Non-targeted series

returns on assets and liabilities, which are dictated by exchange rates and bond prices, are not targeted in the model. This discrepancy with the data leads to an increase in net financial positions from 1973 to 2005, as well as an increase in relative net wealth fraction, which is at odds with the data observations. Nevertheless, a continuous streak of net financial position deterioration emerges in the model since 2005, bringing the untargeted moments closer to the data.

4 Counterfactuals

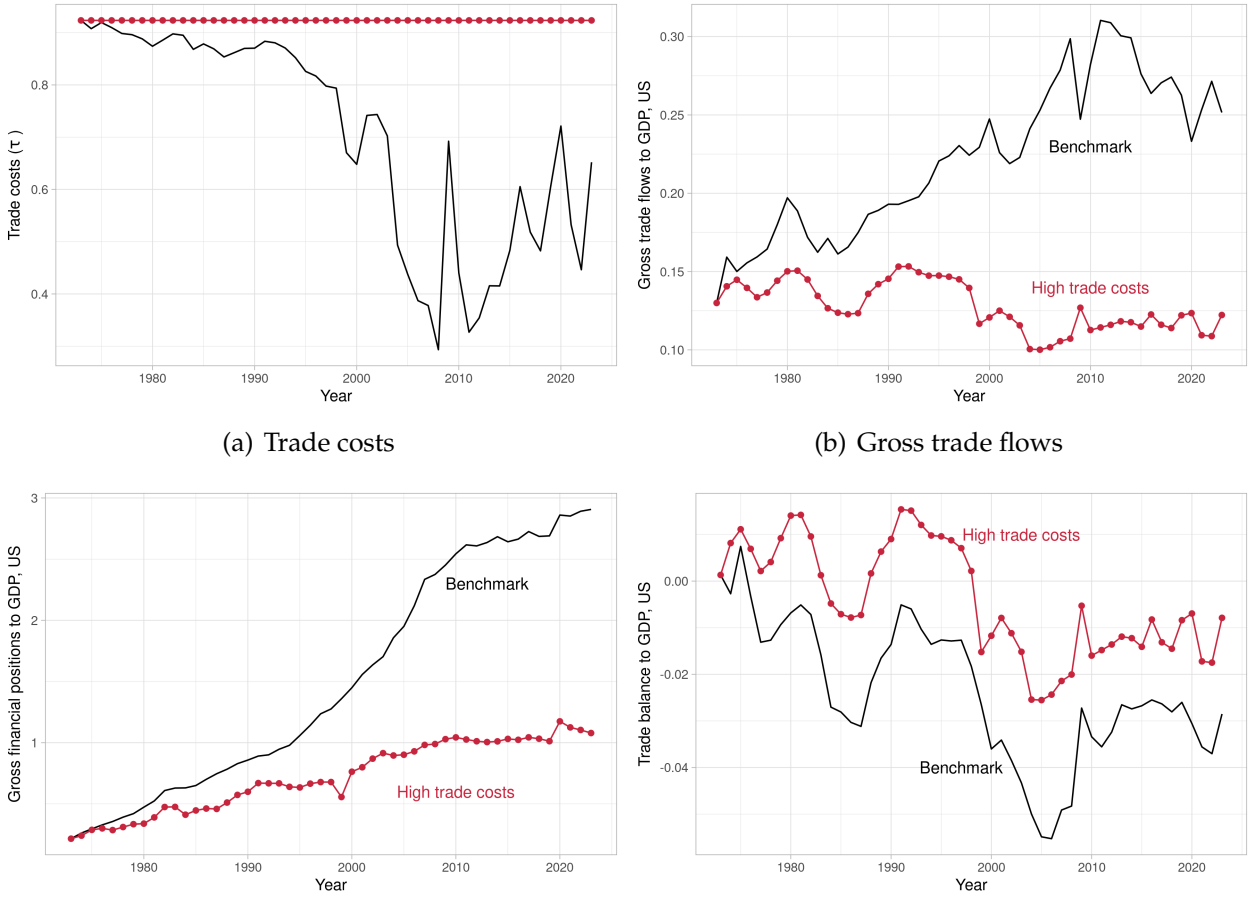
In this section we use our estimated model to conduct a series of counterfactual experiments. First, we mimic the core exercises performed by the original Chari, Kehoe and McGrattan (2007) paper, shutting down the evolution of one of the three shocks at a time. Then we consider other interesting scenarios where we mimic the tightening or loosening of the trade or capital flow frictions at the height of the two most pronounced crisis episodes in recent history – the financial crisis of 2009 and the Covid-19 crisis of 2020. We conclude with two scenario simulations in which we consider the potential effects of campaign promises from the 2024 US Presidential election.

4.1 No trade globalization

The first counterfactual scenario assumes that the trade cost parameter τ remains fixed throughout the sample period at the level corresponding to 1973, the first year in our exercise. Simultaneously, we let the capital control parameter κ and the endowment realizations (y_b, y_m).[1]

Figure 10 presents the results of this exercise. As trade costs are kept artificially high (the red-dotted series), gross trade flows stay predictably down and never exceed the equivalent of 15% of GDP. This also causes the gross financial positions to remain low throughout the period. Without the ability to trade actual goods, the two countries also have much less need for insurance. As a result, the financial positions do not exceed 50% of GDP and by the 2020s, they are over ten times smaller than their factual counterpart. This result shows that globalization in goods trade is a necessary prerequisite for financial globalization. Finally, blocking the decline in τ predicts a reduced level of the US trade

[1] We also keep the globalization regime unchanged at the "high" realization. This means that the exercise can be interpreted as κ embarking on a highly unlikely downward drift, while τ staying fixed close it its mean. The alternative would be to assume that the regime switches from high to low, but τ bucks the trend.



(a) Trade costs

(b) Gross trade flows

(c) Gross financial positions

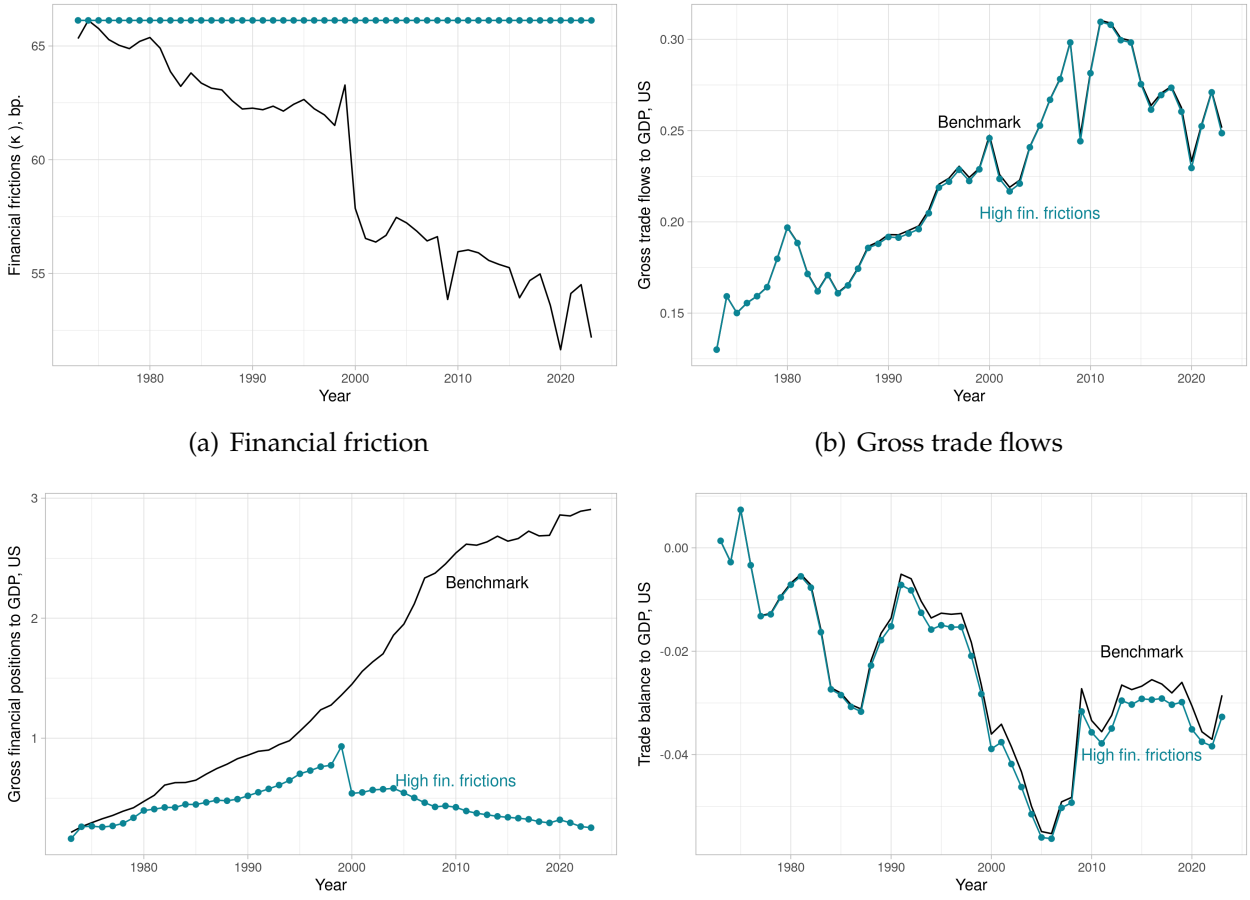
(d) Trade balance

Figure 10: Counterfactual exercises - High trade costs

deficit, although it does not influence its dynamics nearly as much and the two series are highly correlated.

4.2 No financial globalization

In our second counterfactual, we hold the capital control parameter κ fixed at its 1973 level while letting other stochastic variables follow the baseline paths. Figure 11 illustrates the model's predictions in this scenario. The first thing to notice is that any noticeable deviations from the true series materialize starting from late 1990s when κ declines persistently along with the detrended US GDP level. The lack of financial globalization prevents the rise of gross financial positions (kept at less than 100% of GDP) and prominently leads to higher volatility in international trade. While this increased variance is evident in gross trade flows, it is most noteworthy in the case of the US trade deficit, which additionally



(a) Financial friction

(b) Gross trade flows

(c) Gross financial positions

(d) Trade balance

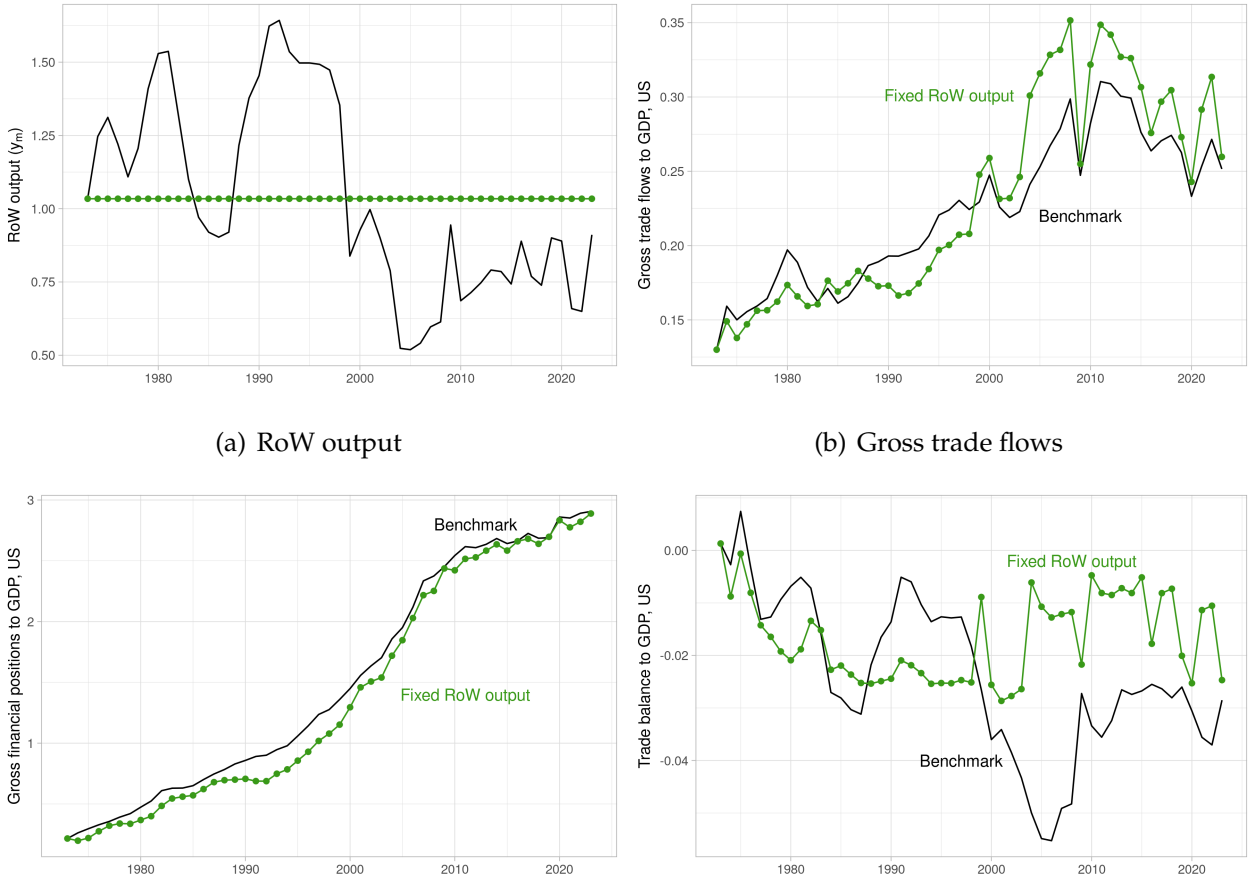
Figure 11: Counterfactual exercises - High financial frictions

increases by about one percentage point for most years since 2000, with several prominent and sharp reversals. This result indicates that financial globalization is an important determinant of the *dynamics* of the US trade balance, unlike the goods globalization which mostly affects its level.

4.3 Globalization with fixed output

We now turn our attention to the pair of scenarios where the output of each one of the countries is fixed at its mean level, while the remaining stochastic variables (in particular, τ and κ) follow their original paths. Figure 12 presents the model's predictions in the case of fixed ROW output (y_m). Because this shock exhibits high variance in reality, the counterfactual series deviate significantly from their baseline variants. In particular, after 2000 we do not allow for a steep decline in ROW output which results in higher gross trade

flows and higher financial positions, as well as a greatly reduced US trade deficit. This is because high ROW output in our model translates to higher demand for foreign goods consumption and a larger imports from the US. Other than the change in their levels, however, the endogenous variables in the model mostly maintain their dynamics which is correlated with the paths of trade costs and capital controls.



(a) RoW output

(b) Gross trade flows

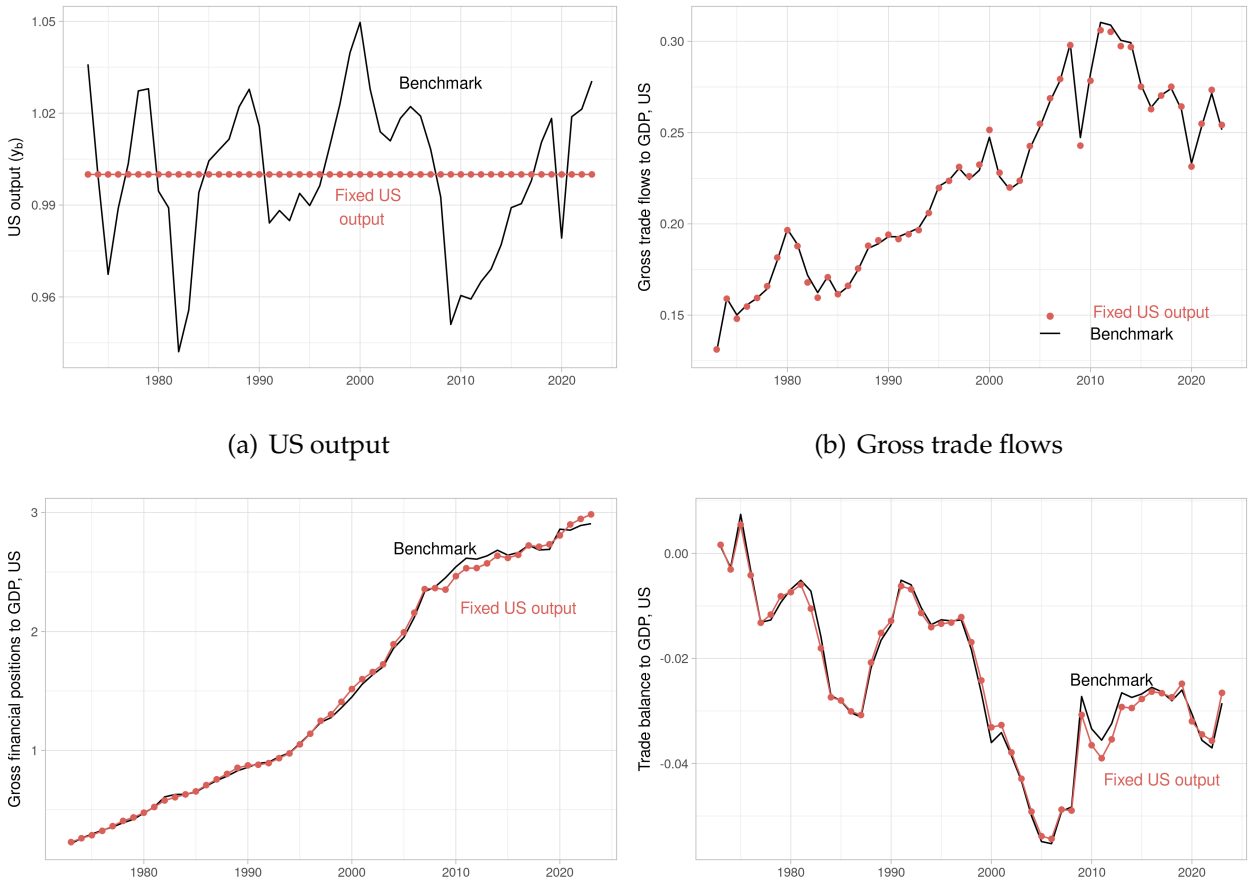
(c) Gross financial positions

(d) Trade balance

Figure 12: Counterfactual exercises - Fixed RoW output

Next, we conduct an analogous exercise in which we fix the US output series to its mean value throughout the sample period. The predictions are depicted in Figure 13. Because US output fluctuates much less than the ROW output, the differences between the counterfactual and the baseline series are smaller. Most notably, in the time period around year 2010, when the US output is factually low, fixing it at a higher level results in slightly less trade and lower financial position, as well as a higher US trade deficit. The intuition is similar to the one for the previous exercise. An artificially higher US output goes hand in

hand with a taste shock that increases demand for consumption. As a result, US imports more from the ROW.



(a) US output

(b) Gross trade flows

(c) Gross financial positions

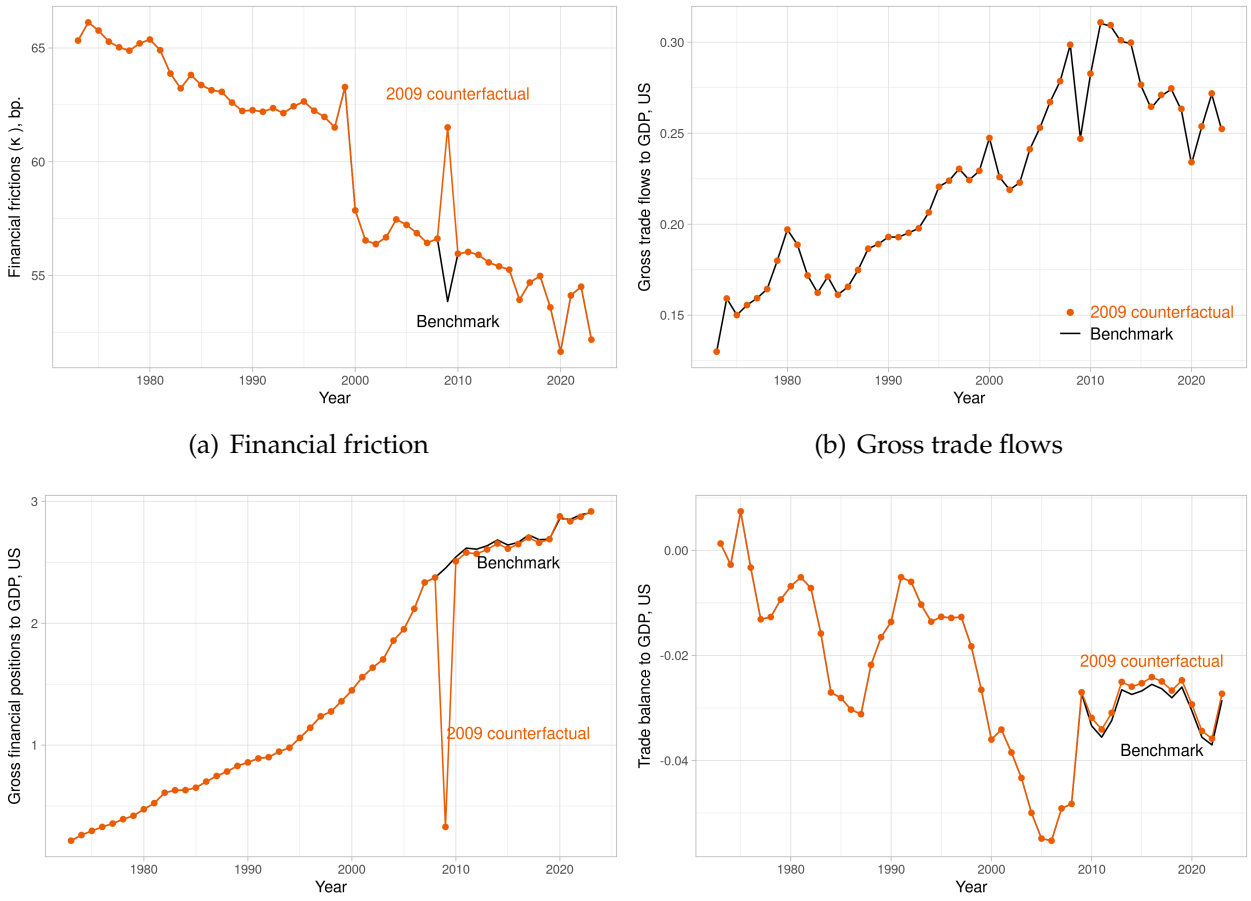
(d) Trade balance

Figure 13: Counterfactual exercises - Fixed US output

4.4 Financial frictions in crisis periods

The next two exercises are more local in their nature by considering a scenario of a counterfactual reversal of financial integration at the height of the two recent crisis episodes – the Global Financial Crisis of 2009 and the Covid-19 crisis of 2020 – the two periods where our baseline model picks up significant spikes in the trade cost parameter τ. We now assume that the capital control parameter κ follows an analogous one-time spike in each of these cases. The results of these exercises are depicted in Figures 14 and 15, respectively. In both cases, the one time spike in κ leads to a temporary collapse of the gross finan-

cial positions, and a rebound with overshooting in the aftermath. The gross trade flows are unaffected (both plunge in these periods due to a simultaneous spike in τ), but once again the US trade balance is affected. Specifically, in both cases the counterfactual deficit is lower, while aligns with the periodic reductions in the deficit that accompany these periods in Figure 11. Interestingly, while the level difference in this exercise is rather small, the deviation turns out to be persistent for the remainder of the sample periods.



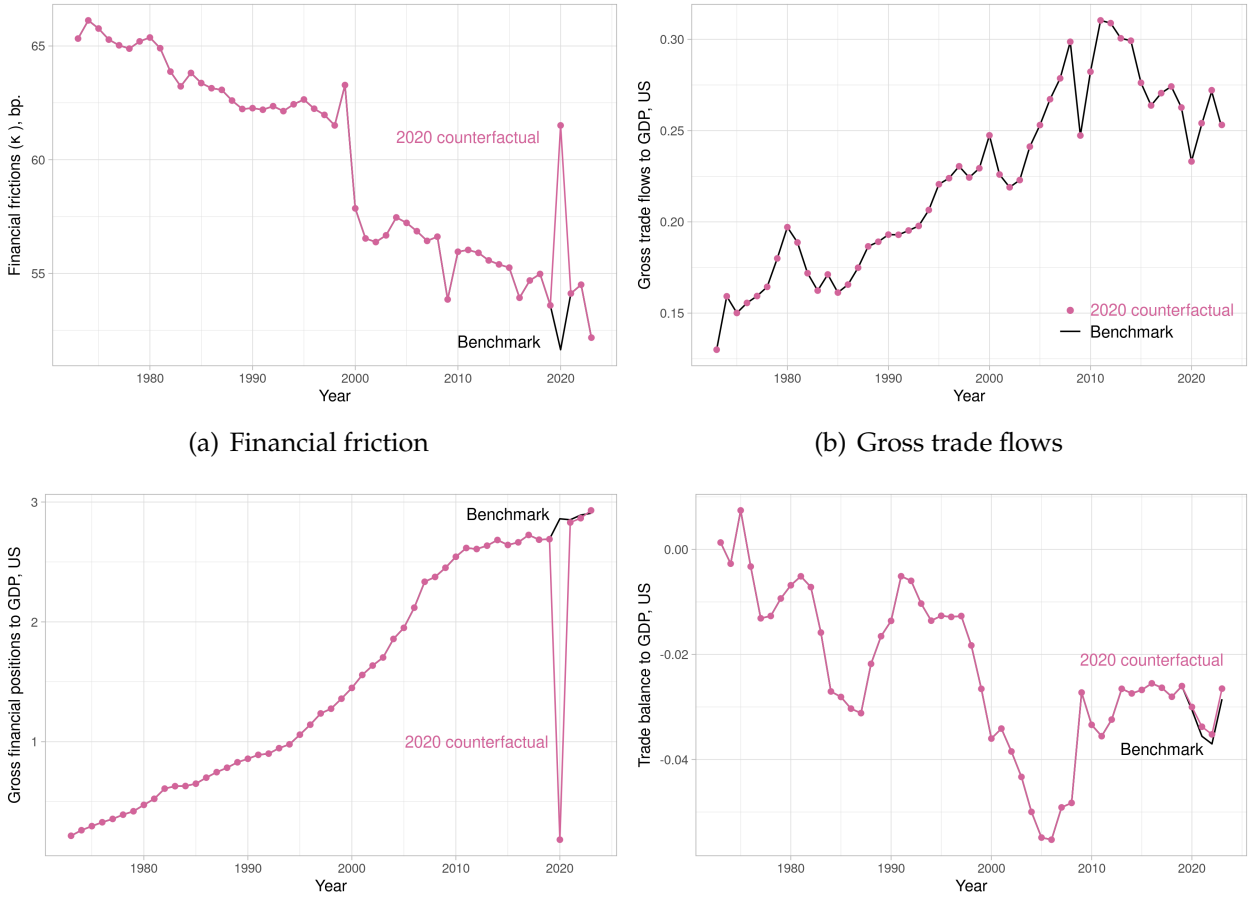
(a) Financial friction

(b) Gross trade flows

(c) Gross financial positions

(d) Trade balance

Figure 14: Counterfactual exercises - Financial frictions hike in 2009



(a) Financial friction

(b) Gross trade flows

(c) Gross financial positions

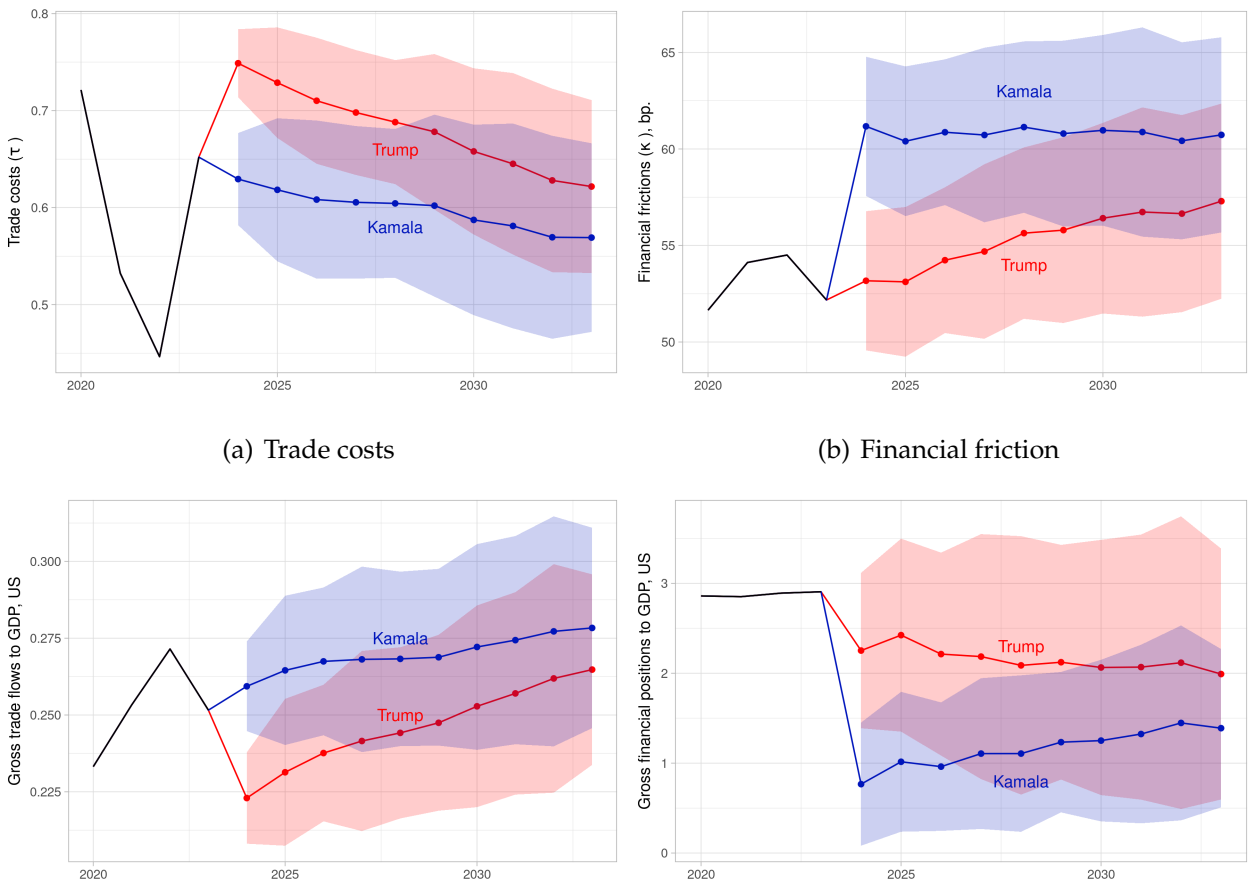
(d) Trade balance

Figure 15: Counterfactual exercises - Financial frictions hike in 2020

4.5 Effects of 2024 US Presidential campaign promises

In this set of experiments, we use our framework to consider the various possible outcomes of the promises made in the 2024 US Presidential election. On the one hand, the Republican candidate Donald Trump promised to impose a uniform 10% tariff on all goods imported into the United States. Through the lens of our model, this would amount to an upward shock to τ, the trade cost variable. On the other hand, the Democratic candidate Kamala Harris repeatedly emphasized her political record of "taking on" Wall Street banks. In our interpretation, this could be modeled as an upward shock to κ, the financial frictions variable. We now consider these two scenarios separately.

Figure 16 describes the setup of our experiments and their direct impact in more detail. In the "Trump" scenario (labeled in red), we increase τ by one standard deviation in year



(a) Trade costs

(b) Financial friction

(c) Gross trade flows

(d) Gross financial positions

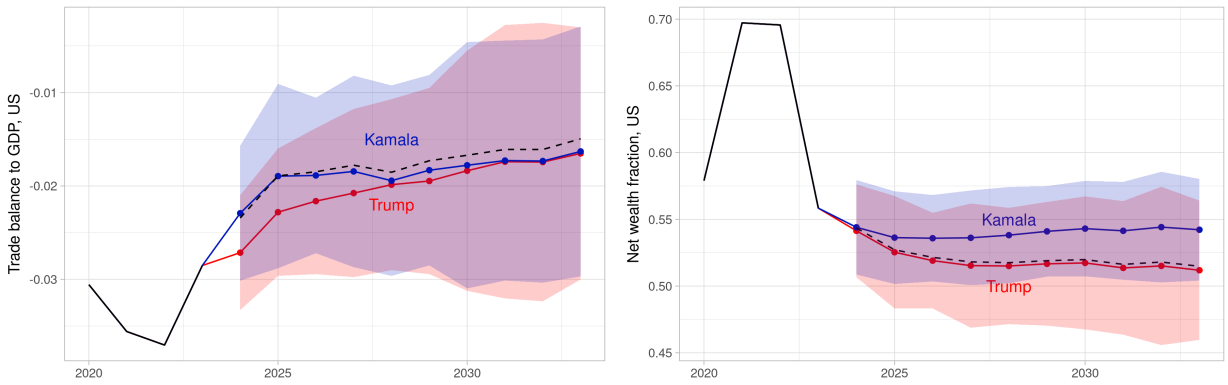
Figure 16: Counterfactual exercises - Presidential Election 2024

2024 (or targeted sample ends in 2023) and then we draw sequences of random numbers to simulate many paths of all the remaining variables (including κ), as well as τ itself starting from the following year. In the "Kamala" scenario (labeled in blue), we orchestrate an analogous one-time increase in financial frictions κ, while simulating the evolution of all other variables, and of κ itself starting from the following year. We report an average across all simulated paths along with confidence intervals that represent the interquartile range.

In this setup, both τ and κ follow declining paths in the aftermath of their political shocks because they mean-revert to their respecting means within the "high globalization" regime. The two scenarios also have predictable, and opposite, direct effects on the endogenous variables in the model. Under Trump, the volume of trade declines and then recovers but never quite catches up with the one under Kamala. On the other hand, the Kamala election leads the gross financial positions to decline on impact and they never catch up with the corresponding path under Trump.

Figure 17(a) plots the simulated paths of the US trade balance under the two election scenarios, along with the baseline with no political distortion (marked with a black dashed line). As is evident, the Trump proposal to raise trade costs in order to curb the deficit has the *opposite* effect in our model. Trade deficit increases due to the fact that heightened trade costs not only reduce imports, but more importantly, exports. The simulated model predicts that the US trade deficit is on the "recovery" path following the expected mean reversion of RoW output. Without the hike in trade costs, the US would reduce its trade deficit by increasing its exports more than imports. However, as the higher trade costs prevent exports from increasing, the trade deficit is on the slower recovery trajectory.

On the other hand, shocks to financial frictions in the Kamala scenario do not have a large impact on the trade balance in the short-run. However, towards the end of the simulation path, the projected trade balance diverts from the baseline scenario – to the extent that the projected trade balance ends up similar to that under Trump. While the long-run paths of trade balance converge at a similarly lower level under both candidates, they are caused by opposite forces as can be seen in Figure 17(b). In the Trump scenario, trade balance deteriorates simultaneously with the net wealth of the US and results in a decrease in the amount of imports. On the other hand, what drives the lower trade balance in the Kamala scenario is a higher net wealth due to restricted financial transactions and an increase in imports compared to the baseline exercise.



(a) Trade balance

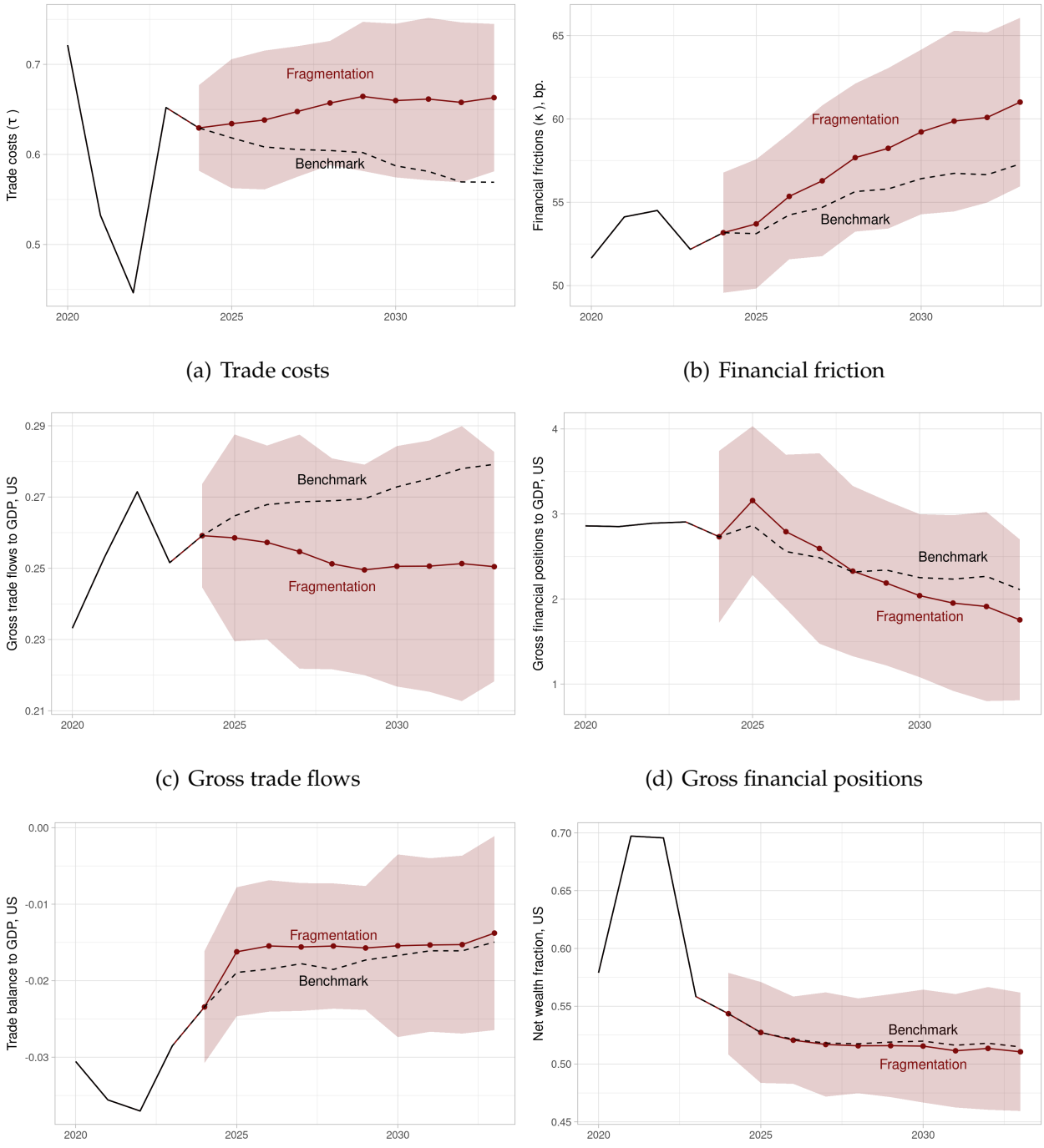
(b) Net wealth

Figure 17: Scenarios for Presidential Election 2024

4.6 Permanent deglobalization

While the experiments described in Section 4.5 concerned a temporary shock to either τ or κ as a result of the promises made on campaign trail, some economists have wondered whether it is the beginning of a new era for globalization. In the final experiment, we investigate the consequences of the underlying regime switching from Low (Globalization) to High (Fragmentation). The structure of this exercise is otherwise analogous to the previous one. We generate many simulated paths under the assumption that the regime switches in 2024 and present the averaged series along with their interquartile range.

Figure 18 presents the result of this experiment. As the regime switches to Fragmentation, both the trade costs and the financial friction series begin a slow upward drift towards their new long-run mean. Along with it, gross trade flows and gross financial positions start declining with the former flattening out at around 25% of GDP. In this exercise, we find that the US trade deficit actually shrinks considerably in the short run, but eventually converges most of the way with its path under the baseline scenario. As such, we find that neither temporary shocks to trade costs or financial frictions, nor a permanent change of the globalization regime, can dominate the fundamental forces behind the long term evolution of the trade deficit.



(a) Trade costs

(b) Financial friction

(c) Gross trade flows

(d) Gross financial positions

(e) Trade balance

(f) Net wealth

Figure 18: Counterfactual exercises - Fragmentation regime switch

5 Conclusion

This paper develops a methodology to use the observed volumes of international trade and finance to uncover the drivers of globalization. To do so, we develop a quantitative model in which gross trade and capital flows across countries are explicitly determined. By matching the observed volumes exactly, we are able to find the time series of trade costs and financial frictions that have propelled economic globalization over the past half century. The model calibrated in this way is a potent laboratory to study various counterfactuals as well future policy scenarios.

We find that the decline in trade costs is the primary driver of globalization, a necessary condition for the increase in the volume of both trade and financial flows. Financial integration follows and is necessary predominantly for the rise in the gross capital flows. However, both of these factors are important in shaping the path of the US trade deficit over the past quarter century. The declining trade costs mostly affect its level, while financial integration greatly reduces its volatility.

References

ALESSANDRIA, GEORGE, YAN BAI, AND SOO KYUNG WOO (2023): "Rising Current Account Dispersion: Financial or Trade Integration?", *unpublished manuscript*.

ATKESON, ANDREW, JONATHAN HEATHCOTE, AND FABRIZIO PERRI (2023): "The End of Privilege: a Reexamination of the Net Foreign Asset Position of the United States", *unpublished manuscript*.

BAI, JUSHAN AND PIERRE PERRON (1998): "Estimating and Testing Linear Models with Multiple Structural Changes," *Econometrica*, 66, 47-78.

BAI, YAN, JOSE-VICTOR RIOS RULL, KJETIL STORESLETTEN (2024): "Demand Shocks as Technology Shocks," *Review of Economic Studies*, forthcoming.

BAI, YAN, AND JING ZHANG (2012): "Financial integration and international risk sharing", *Journal of International Economics*, 86, 17-32.

CAPELLE, DAMIEN, AND BRUNO PELLEGRINO (2025): "Unbalanced Financial Globalization", *unpublished manuscript*.

CHARI, V.V., PATRICK J. KEHOE, AND ELLEN R. MCGRATTAN (2007): "Business Cycle Accounting", *Econometrica*, 75(3), 781-836.

EPSTEIN, LARRY G. AND STANLEY E. ZIN (1989): "Substitution, Risk Aversion and the Temporal Behavior of Consumption and Asset Returns: A Theoretical Framework", *Econometrica*, 57: 937-968

FITZGERALD, DOIREANN (2012): "Trade Costs, Asset Market Frictions, and Risk Sharing", *American Economic Review*, 102(6), 2700–2733.

HU, CHENYUE (2023): "Portfolio Choice Analysis in a Multi-country Macro Model", *unpublished manuscript*.

JUNG, HEESUK (2020): "Effects of Trade Costs and Capital Controls on Trade Imbalances", *Ph.D. Dissertation, University of Houston*.

KEHOE, TIMOTHY J., KIM J. RUHL, JOSEPH B. STEINBERG (2018): "Global Imbalances and Structural Change in the United States", *Journal of Political Economy*, 126(2), 761–796.

KLEINMAN, BENNY, ERNEST LIU, STEPHEN J. REDDING, AND MOTOHIRO YOGO (2025): "Neoclassical Growth in an Interdependent World", *unpublished manuscript*.

LEE, HYUNJU (2024): "A Model of Gross Capital Flows: Risk Sharing and Financial Frictions", *International Economic Review*, forthcoming.

MANOVA, KALINA (2013): "Credit Constraints, Heterogeneous Firms, and International Trade", *Review of Economic Studies*, 80, 711-744.

MENDOZA, ENRIQUE, G., VINCENZO QUADRINI, AND JOSÉ-VÍCTOR RÍOS-RULL (2009): "Financial Integration, Financial Development, and Global Imbalances", *Journal of Political Economy*, 117, 371-416.

PALUSZYNSKI, RADOSLAW (2023): "Learning About Debt Crises", *American Economic Journal: Macroeconomics*, 15(1), 106-134.

REYES-HEROLES, RICARDO (2016): "The Role of Trade Costs in the Surge of Trade Imbalances", *unpublished manuscript*.

SPOSI, MICHAEL (2022): "Demographics and the evolution of global imbalances", *Journal of Monetary Economics*, 126, 1-14.

WAUGH, MICHAEL E., AND B. RAVIKUMAR (2016): "Measuring Openness to Trade", *Journal of Economic Dynamics and Control*, 72.