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ORIGINAL PAPER

Should Europe Continue to Fund U.S. Federal Debt?

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Abstract
This paper examines the possible triggers that could unsettle the asymmetric equilibrium of the international monetary system, by eroding the global role of the dollar and the associated "exorbitant privilege". We develop a calibrated two-period, two-economies general equilibrium model for the United States and Europe in which the latter derives a convenience yield from holding US debt—denominated in the dominant reserve currency. Our simulations indicate that a US fiscal expansion (even if combined with stronger economic growth), rising trade barriers, and heightened default risk on foreign-held US sovereign debt all tend to curb the external demand for US safe assets. The upward pressure on US real yields and the significantly weaker outlook for the real exchange rate of the dollar would imply a partial reversal of the benefits the United States derives from dollar dominance. For Europe its exposure to US policy and institutional uncertainty increases, a situation that is likely to persist lest Europe develops a genuine safe asset of its own.

Keywords Reserve currencies · Exorbitant privilege · Triffin dilemma · Fiscal policy · Public debt · Safe assets

JEL Classification E32 · E63 · F33 · F42

1 Introduction

The international monetary system is fundamentally asymmetric, with the United States providing the global currency (the US dollar) and the main reserve asset (US Federal debt), in which the rest of the world invests. This feature allows the United

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States to issue debt at favourable terms, boosting its "fiscal space"—an important dimension of the "exorbitant privilege" it has enjoyed to date (Chen et al., 2023; Subacchi & van den Noord, 2023). This paper examines how recent policy shifts by the Trump administration, in office since January 2025, may affect foreign demand for the US federal debt, risk perceptions, interest rate spreads, and the dollar's real exchange rate. It contributes to the growing literature on possible triggers that could undermine the (asymmetric) equilibrium of the international monetary system, by eroding the global role of the dollar and the associated "exorbitant privilege". We see the actions of the Trump administration, envisaged or implemented, as such a possible trigger.

Two policy directions of the Trump administration take centerstage in our analysis. *First*, the administration has called for creditor countries to limit their official dollar reserves to weaken the dollar and to accept less favorable terms on their holdings of US Federal debt—an initiative dubbed the "Mar-a-Lago Accord" with a nod to the Plaza and Louvre Accords of the 1980s (Miran, 2024). Though not yet implemented as formal policy, these calls signal a potential shift in how the current administration sees its obligations to foreign creditors. *Second*, the administration has implemented large, and often arbitrarily applied, increases in import tariffs aimed at reducing the US current account deficit.

These policies were initially framed as serving domestic economic objectives, notably to reverse losses in US industrial activity to foreign competition. But the underlying rationale seems to have shifted, with the dollar increasingly deployed as a tool of coercion, intended to extract compensation for the public goods the United States has supplied to the world, including military protection and the provision of the global reserve currency. The world is no stranger to spillover effects of the US domestic policies. Until recently, however, these spillovers occurred within a multilateral framework of cooperation, that includes willingness to provide a global financial safety net. This framework may now be eroding, or—as the US Treasury Secretary Scott Bessent has suggested—"a grand global economic reordering" may be underway (Rudegeair & Zuckerman, 2024).

To assess the spillover effects of Trump's economic policies, we develop a two-period, two-economy general equilibrium model around stylised representations of the United States and Europe.[1] The model is numerically calibrated to reflect empirical benchmarks derived from the mainstream literature. In the model Europe derives utility from holding US sovereign debt—due to its liquidity and role as the foundation of the international payments system—and for which it is prepared to pay a convenience yield. This feature creates a fundamental asymmetry in the model and allows us to examine how various shocks affect the equilibrium demand for reserve assets, the interest rate differential between the two countries, and the real exchange rate dynamics.

The remainder of the paper is organized as follows. The next section briefly examines the data on the international holdings of US Treasuries and reviews the related literature on dollar dominance, exorbitant privilege, and recent work on de-dollar-

[1] Given its generality, in our stylized model 'Europe' may be interpreted as referring to any EU-related jurisdiction, such as the euro area or the European Economic Area (EEA), or all US allies in Europe.

ization and financial coercion. We then present our model and numerical calibration. Subsequently, we conduct three shock experiments corresponding to our research questions and discuss their comparative impacts. The final section reflects on the conditions that must be met for Europe to be able to offer a real alternative to the US-provided safe asset and a reallocation of European savings into euro-denominated reserves.

2 Empirical Motivation and Related Literature

Of the total of US Federal debt in 2025 of over 120% of US GDP, approximately one-quarter is funded by foreign creditors—including central banks and private investors (Fig. 1). According to the US Treasury TIC (Treasury International Capital) data, Japan, Europe and China have accumulated the largest dollar reserves internationally, with the bulk invested in US Treasury securities (Fig. 2). In the early 2000s China has surpassed Japan as the largest holder of such debt. However, Fig. 2 shows a substantial increase, since 2015, in the holding by Europe (both the European Union and the United Kingdom), while China has reduced its exposure significantly over the same period to reduce its dependence on the dollar-based system. The increase in European demand presumably has been driven mainly by private investors, attracted by the higher yields on US Treasuries relative to domestic alternatives. However, it

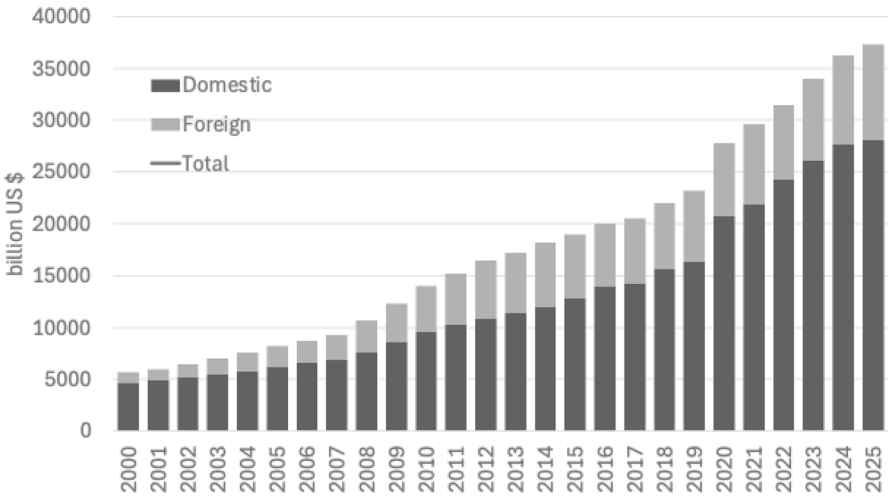

Fig. 1 Foreign and domestic holdings of US Federal debt. Source: Board of Governors of the Federal Reserve System and US Department of the Treasury

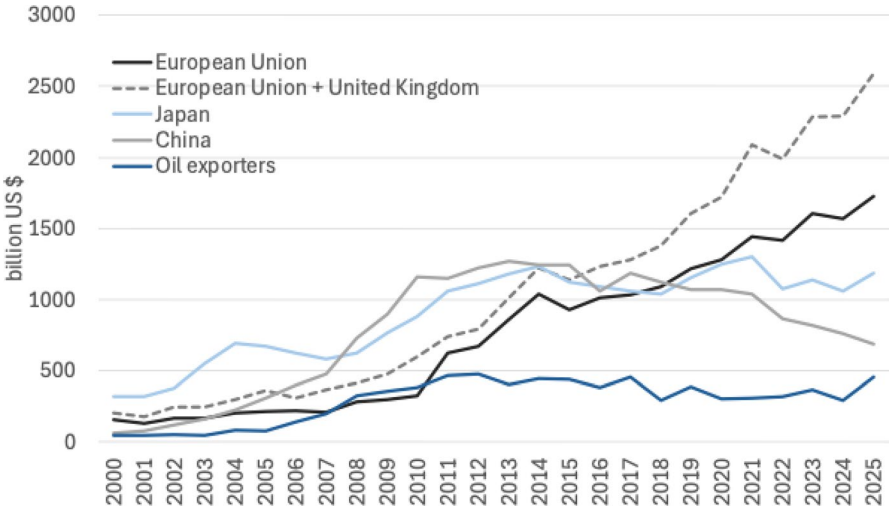

Fig. 2 Foreign holdings of US Federal debt by country or jurisdiction. Source: US Department of the Treasury. The jurisdictions included in this figure are the five largest investors in US Federal debt

also reflects the possibility that the custody of these securities have been transferred to financial centres in Europe without necessarily transferring ownership.[2]

Against this backdrop, our paper contributes to the vast literature on global dollar dominance and the "exorbitant privilege". Specifically, our analysis builds on the literature on:

1. The resilience of the global role of the dollar, with the emphasis on the network advantages for global invoicing and settlement. This literature premises that the use of a currency for trade invoicing creates incentives for firms to hold liquid funds and issue liabilities in that currency, and for governments to hold their foreign exchange reserves in that currency (Farhi & Maggiori, 2018; Goldberg, 2010; Goldberg & Tille, 2008; Gopinath, 2016; Gopinath & Stein, 2018).
2. The role of US Federal debt to meet the growing global demand for a liquid and safe asset denominated in US dollars (Gourinchas & Rey, 2007b; Caballero et al., 2008; Caballero & Krishnamurthy, 2009; Canzoneri et al., 2013; Maggiori, 2017; He et al., 2018; Gopinath & Stein, 2018; Krishnamurthy & Lustig, 2019; Choi et al., 2022; and Mukhin, 2022).
3. The fiscal dimension of the dollar's dominance, stemming from the safe-haven properties of US dollar assets and the associated demand for US government bonds. Owing to this feature, the US government has been able to borrow more

[2] An important caveat is in order regarding this data source. The TIC data assigns securities to the country of custody, not the ultimate owner. The United Kingdom, Luxembourg, Ireland and Belgium (Euroclear), are all global custody hubs, so their reported holdings at least in part reflect global, not just local, developments. For instance, although impossible to support with data, there is some reason to suspect that part of the recent increase in European Treasuries holdings is in fact attributable to Chinese private investors using European custodians. Even so, in our judgment the holdings of Treasuries by European investors must have significantly risen over the past decade and a half, even if not by as much as the TIC data suggest.

than it otherwise would (Bassetto & Cui, 2018; Blanchard, 2019; Brunnermeier et al., 2022a, 2022b; Chen et al., 2023; Cheng & Zhang, 2011; Furman & Summers, 2020; Mehrotra & Sergeyev, 2021; Mian et al., 2021; Reis, 2021; Schuknecht, 2018).[3]

4. The implications of dollar weaponisation on foreign demand for US debt. This recent literature focuses on the impact of financial coercion—through sanctions and asset freezing—on foreign holding of US debt (Bianchi & Sosa-Padilla, 2025; Brunnermeier et al., 2022a, 2022b; Ghironi et al., 2024; Weiss, 2022).

In this paper we do not explicitly model the network properties of the US dollar, but simply assume that these are pervasive enough to motivate the use of the dollar as the global reserve currency. Nor do we explicitly model the investment portfolio decisions that lay behind the choice of US Treasury debt as the global safe asset, and simply assume this asset to fill this role. By contrast, we do model explicitly the fiscal dimension of the exorbitant privilege and the possibility of dollar weaponisation as proposed by the literature, as this is the focus of our paper.

Our model has much in common with Bianchi and Sosa-Padilla (2025). They, like us, model the demand for dollar assets in a two-period and two-country framework. And they, like us, assume that households based in the lender country derive utility ("convenience") from dollar assets, as also proposed by e.g. Jiang (2024) and Cheng and Zhang (2011, 2012). However, in the analysis of Bianchi and Sosa-Padilla (2025) the lender country in question is China, as their focus is on the impact of a risk of confiscation of dollar assets. This relates to the literature on de-dollarization that considers the drivers for some countries, most prominently China, to gradually reduce their holding of US Federal debt, spurred by the increased geopolitical fragmentation to become more independent from and less constrained by the United States (Eichengreen, 2023; Li, 2024). Some observers see this as the prime explanation of the comparatively high level of US yields in recent years (Ahmed & Rebucci, 2025).

Another difference from Bianchi and Sosa-Padilla (2025) is that we focus on a scenario in which dollar reserve assets are subject to partial default, which relaxes the fiscal constraint facing the United States. As a result, while our demand function for dollar assets is basically the same as in Bianchi and Sosa-Padilla (2025)—upward sloping in the return on dollar assets, downward sloping in the return on non-dollar assets and the risk of default (or confiscation)—the supply functions are fundamentally different. In their case, the supply of dollar assets is a function of the yield spread between foreign assets and liabilities, in line with the literature on the US role as the "global banker", which posits that the quasi-monopolistic position of the dollar in

[3] Some strands of this literature raised warnings that US overborrowing could undermine foreign investors' confidence in the ability to repay this debt and avoid a currency devaluation (Despres et al., 1966; Farhi and Maggiori, 2018; Schuknecht, 2018). Others have argued, however, that because of the size of the US economy and its institutional framework a confidence crisis would be unlikely to develop (Bi, 2012; Bi et al., 2016; Blanchard, 2023, 2019; Kose et al., 2017). In a previous paper (Subacchi and Van den Noord, 2023) we show empirically that the rapid build-up of dollar reserves has allowed the US administration to conduct a more expansionary fiscal policy at times of crisis without triggering capital outflows. This is what happened, by contrast, in September 2022 when the UK Prime Minister Liz Truss unveiled a 'mini budget' with GBP 45 billion of unfunded tax cuts, resulting in financial instability and the intervention of the Bank of England to backstop the gilt market.

international finance has allowed the United States to build large gross cross-border positions and long positions in risky securities, financed by dollar-denominated securities at a comparatively favourable yield (Gourinchas & Rey, 2007a, 2016; Milesi-Ferretti, 2021; Atkeson et al., 2023). In our case, in contrast, the supply of dollar assets is essentially a function of US fiscal policy.[4]

Finally, our stylised two-period model assumes that the country issuing the global reserve asset must run a trade surplus in the second period to repay its (public) external debt built up in the first period. Hence the US trade deficit would need to unwind at some stage, as argued by, for instance, Blanchard et al. (2005). This contrasts with approaches where the reserve asset provider could continue to run trade deficits forever, as embedded in models with an infinite time horizon (e.g. Felbermayr et al., 2023) and in static one-period models (Cheng & Zhang, 2012).

3 The Model

We set up a stylised two-by-two (two countries and two periods) dynamic general equilibrium model to study the shock responses of interest rates and the exchange rate.[5] Both countries are simple endowment economies without an explicit role for monetary policy to determine the overall price level. The latter implies that movements in the real exchange rate are not broken down into movements in the nominal exchange rate and the inflation rate and that real interest rates are not broken down into the nominal interest and inflation rates (the model is "real" in that sense). All prices are flexible (no nominal rigidities), and the only asymmetry in the model is that one country derives utility from holding public debt in the other country, but not conversely.

3.1 Basic Assumptions

Each country comprises a representative household and a government sector. The latter issues debt to spend in the first period and raises tax to repay debt in the second period. The first period is denoted as 'period 0' and the second period is 'period 1', with each 'period' best interpreted as a relatively long stretch of time, for instance a decade.

The model is perfectly symmetric across the two countries, except for the role of government bonds issued by the 'Home' country. The Home country provides the global reserve asset. This global reserve status is assumed to arise from the Home country's currency being used to settle international trade in the rest of the world, but this is not explicitly modelled. The other or 'Foreign' country accumulates sovereign debt issued by the Home country in period 0, which is assumed to be liquid and eas-

[4] Technically it should be feasible to merge the two approaches in a single model, but we leave this to future research. Numerous other extensions of the model could be envisaged as well, which are also left to future research. Aside from an explicit role for monetary policy, these might include allowing the supply of goods to vary due to trade-offs between labor and leisure, introducing nominal rigidities that lead to disequilibria in supply and demand, or a distinction between tradable and non-tradable goods.

[5] See for example of such a model Chapter 2 in Uribe and Schmitt-Grohé (2017).

ily convertible in the global currency without exchange rate risk. Foreign households earn a return on this investment, but this is generally lower than the return on debt issued by the Foreign country itself, owing to a 'convenience yield' earned on the Home country's debt.

In each country and period, the representative household chooses the optimal mix of consumption goods supplied domestically and abroad (*intra-temporal allocation*). There is a bias towards goods supplied domestically (home bias), though both countries adjust their basket of imported and domestically produced goods in response to changes in the real exchange rate. At given real exchange rates there is a unique solution for each country and each period where global goods markets are cleared.

The representative households in each country also choose the intertemporal mix of consumption that maximizes utility over both periods (*intertemporal allocation*), with the real interest rates serving as the key adjustment variables. The representative household in the Foreign country also chooses the size of its investment in public debt issued by the Home country, based on the real interest rates and exchange rates as well as the default risk on Home country debt (which is generally low except under extreme conditions). At all times, inter-temporal equilibrium requires that the current account and capital account positions match (balance of payment constraint). Here the real exchange rate in each period is the key adjustment variable.

3.2 Intra-temporal Allocation

Turning to the formal representation of the model, households in each country derive utility from the consumption of Home goods and Foreign goods, based on Cobb–Douglas utility functions. By convention the countries are denoted as *H* and *F* for 'Home' and 'Foreign'. Symbols with an asterisk are occasionally used to refer to the Foreign country as well, while symbols without an asterisk generally refer to the Home country. The utility functions read:

$$C_t = \vartheta C_{Ht}^{\alpha} C_{Ft}^{1-\alpha}, C_t^* = \vartheta {C_{Ht}^*}^{1-\alpha} {C_{Ft}^*}^{\alpha}, \vartheta = \frac{1}{\alpha^{\alpha}} \frac{1}{(1-\alpha)^{1-\alpha}}, \tag{1}$$

where aggregate consumption in the Home and Foreign country are denoted as C_t and C_t^*, while C_{Ht} and C_{Ft} are real consumption of Home-produced and Foreign-produced goods in the Home country, andC_{Ht}^*, C_{Ft}^* are their equivalents for the Foreign country.

The problem is to minimize the costs to achieve given amounts of aggregate consumption C_t and C_t^* subject to the budget identities:

$$C_t P_t = P_{Ht} C_{Ht} + P_{Ft} C_{Ft}, P_t^* C_t^* = P_{Ft}^* C_{Ft}^* + P_{Ht}^* C_{Ht}^*, \tag{2}$$

where P_{Ht}, P_{Ft} and P_t denote the prices of goods produced domestically, imported goods and aggregate consumption in the Home country, and P_{Ht}^*, P_{Ft}^* and P_t^* are their equivalents in the Foreign country. The first order conditions read:

$$C_{Ht} = \alpha \frac{P_t}{P_{Ht}} C_t, C_{Ft} = (1-\alpha) \frac{P_t}{P_{Ft}} C_t,$$

$$C^*_{Ht} = (1-\alpha) \frac{P^*_t}{P^*_{Ht}} C^*_t, C^*_{Ft} = \alpha \frac{P^*_t}{P^*_{Ft}} C^*_t. \tag{3}$$

Incorporating (3) in the utility functions (1) yields the aggregate price levels in each country:

$$P_t = P_{Ht}^{\alpha} P_{Ft}^{1-\alpha}, P^*_t = {P^*_{Ht}}^{1-\alpha} {P^*_{Ft}}^{\alpha}. \tag{4}$$

We assume that the law of one price holds, i.e. after conversion at the nominal exchange e_t each good sell at the same price in both countries, i.e.:

$$e_t = \frac{P^*_{Ht}}{P_{Ht}} = \frac{P^*_{Ft}}{P_{Ft}}, \tag{5}$$

where e_t is the exchange rate of the Foreign currency per unit of the reserve currency. It is convenient to define the terms of trade as:

$$S_t = \frac{P^*_{Ht}}{P^*_{Ft}} = \frac{P_{Ht}}{P_{Ft}}. \tag{6}$$

With Y_t and Y^*_t denoting the (exogenous) production endowments in each country and period, the market clearing conditions read:

$$Y_t = G_t + C_{Ht} + C^*_{Ht}, Y^*_t = G^*_t + C_{Ft} + C^*_{Ft}, \tag{7}$$

where G_t and G^*_t denote government expenditure in each country, assumed to be produced locally. Combining these conditions with (3, 4, 5 and 6) yields for each country and period:

$$Y_t = G_t + \alpha S_t^{-(1-\alpha)} C_t + (1-\alpha) {S_t}^{-\alpha} C^*_t, Y^*_t = G^*_t + (1-\alpha) {S_t}^{\alpha} C_t + \alpha {S_t}^{1-\alpha} C^*_t. \tag{8}$$

From this we can solve aggregate consumption C_t, and C^*_t in each country:

$$C_t = \frac{\alpha {S_t}^{1-\alpha} (Y_t - G_t) - (1-\alpha) {S_t}^{-\alpha} (Y^*_t - G^*_t)}{2\alpha - 1},$$

$$C^*_t = \frac{\alpha S_t^{-(1-\alpha)} (Y^*_t - G^*_t) - (1-\alpha) {S_t}^{\alpha} (Y_t - G_t)}{2\alpha - 1}. \tag{9}$$

With real endowment output Y_t and Y^*_t and government spending G_t and G^*_t given, the system (9) consists of four equations (two for each of the two periods (0 and 1) with six unknowns C_0, C^*_0 C_1, C^*_1, S_0 and S_1. Therefore, when the terms of trade S_t

are known, the aggregate consumption volumes C_t and C_t^* in each country are also known.

3.3 Intertemporal Allocation

We assume government expenditure to take place in period 0 only, such that $G_0 = G$, $G_1 = 0$, $G_0^* = G^*$ and $G_1^* = 0$. In period 0 each country's government issues real debt D and D^*, respectively, to fund its real public expenditure G and G^*. In period 1 the governments raise a real tax T and T^*, respectively, used to repay the real debt at a gross real rate of return R and R^*. A crucial assumption is that the government of the Home country has the power to default on its foreign-held debt. The period 0 and period 1 budget identities for the government sectors then read:

$$G\frac{P_{H0}}{P_0} = D, R\left(D - \lambda D_F\right) = T, G^*\frac{P_{F0}^*}{P_0^*} = D^*, R^*D^* = T^*. \tag{10}$$

where D_F is debt held by households in the Foreign country and λ is a stochastic shock variable that is nil with a probability $1 - p$ and equal to a fixed positive number with a probability p. The shock variable λ has a similar interpretation as in the model proposed by Bianchi and Sosa-Padilla (2025), except that in their case it refers to 'confiscation' of foreign-held debt (sanctions), while in our case it refers to default, meaning that it, *ceteris paribus*, allows the tax take to be smaller.

Making use of the definition of the terms of trade S_t in (5), it is convenient to reformulate the dynamic budget constraints in (10) as:

$$G{S_0}^{1-\alpha} = D, R\left(D - \lambda D_F\right) = T, G^*{S_0}^{-(1-\alpha)} = D^*, R^*D^* = T^*. \tag{11}$$

We assume that households in both countries derive utility U and U^* from consumption in both periods, while households in the Foreign country also derive utility from the convenience of holding sovereign bonds of the Home country:

$$U = \sum_{t=0,1} \beta^t \frac{{C_t}^{1-\sigma}}{1-\sigma}, U^* = \sum_{t=0,1} \beta^t \frac{{C_t^*}^{1-\sigma}}{1-\sigma} + \gamma\frac{{D_F}^{1-\eta}}{1-\eta}, \tag{12}$$

where utility is captured by two-period CRRA (Constant Relative Risk Aversion) utility functions, and $1/\beta > 1$ is the pure rate of time preference. The parameters σ and η are the coefficients of relative risk aversion and $1/\sigma$ and $1/\eta$ are the elasticities of intra-temporal substitution. If $0 < \sigma < 1$ and $0 < \eta < 1$ the law of diminishing marginal utility of present and future consumption and holding Home country debt applies.

Households in each country face the dynamic budget constraints:

$$\frac{P_{H0}}{P_0}Y_0 = C_0 + D_H, \frac{P_{H1}}{P_1}Y_1 + RD_H - T = C_1,$$

$$\frac{P^*_{F0}}{P^*_0}Y^*_0 = C^*_0 + e_0\frac{P_0}{P^*_0}D_F + D^*_F, \frac{P^*_{F1}}{P^*_1}Y^*_1 + e_1\frac{P_1}{P^*_1}RD_F\left(1-\lambda\right) + R^*D^*_F - T^* = C^*_1. \quad (13)$$

Note that the representative household in the Foreign country allocates some its savings to debt issued by the Home country in period 0, with the gross return on this debt in period 1 is subject to the default risk factor λ.

The first order conditions for maximum utility subject to (13), yield the usual Euler equations determining the real interest rates R and R^* and a demand equation for the holdings of Home country debt in the Foreign country D_F:

$$R = \frac{1}{\beta}\left(\frac{C_1}{C_0}\right)^{\sigma}, R^* = \frac{1}{\beta}\left(\frac{C^*_1}{C^*_0}\right)^{\sigma}, {D_F}^{\eta} = \frac{\gamma {C^*_0}^{\sigma}}{{S_0}^{2\alpha-1}\left[1-\left(\frac{S_1}{S_0}\right)^{2\alpha-1}\frac{R(1-\lambda)}{R^*}\right]}. \quad (14)$$

Note that the demand for Home country debt D_F increases with the evolution in the terms of trade S_1/S_0 (which represents a real capital gain) and the yield spread R/R^* , and falls with the default risk factor λ. Note also that ${S_0}^{2\alpha-1}$ and ${S_1}^{2\alpha-1}$ are the *real exchange rates* of the Home country against the Foreign country in each period, which serve to convert the latter's investment in the Home country's debt to local currency, i.e.:

$$e_0\frac{P_0}{P^*_0} = {S_0}^{2\alpha-1}, e_1\frac{P_1}{P^*_1} = {S_1}^{2\alpha-1}. \quad (15)$$

This demand for Home country debt D_F is the basic source of asymmetry in the model. If $\gamma = 0$ (no convenience yield on Home country debt), $D_F = 0$ and equilibrium is symmetric, but not if $\gamma > 0$. Note also that increases in the risk factor λ raises the sensitivity of the demand for the reserve asset (Home debt); see for recent empirical evidence Yang and Wang (2024).

Intertemporal equilibrium requires that the following bond market clearing conditions must hold:

$$D = D_H + D_F, D^* = D^*_F, \quad (16)$$

meaning that total debt issued by the Home country D consists of Home country debt held at Home D_H and abroad D_F whereas Foreign country debt D^* is held only by households in the Foreign country (D^*_F).

Consolidating the dynamic budget identities for the government (10) and for households (13) with the bond market clearing conditions (16) yields the balance of payment constraints:

$$D_F = C_0 - \frac{P_{H0}}{P_0}\left(Y_0 - G\right), RD_F\left(1-\lambda\right) = \frac{P_{H1}}{P_1}Y_1 - C_1,$$

$$e_0 \frac{P_0}{P_0^*} D_F = \frac{P_{F0}^*}{P_0^*} \left(Y_0^* - G^*\right) - C_0^*, e_1 \frac{P_1}{P_1^*} R D_F \left(1 - \lambda\right) = C_1^* - \frac{P_{F1}^*}{P_1^*} Y_1^*. \quad (17)$$

This implies that cross-border capital flows must match the current account positions in each period and for each country. Making use of (4, 5 and 6) it is again convenient to restate this balance of payment constraints as:

$$D_F = C_0 - {S_0}^{1-\alpha} \left(Y_0 - G\right), R D_F \left(1 - \lambda\right) = {S_1}^{1-\alpha} Y_1 - C_1,$$

$${S_0}^{2\alpha-1} D_F = {S_0}^{-(1-\alpha)} \left(Y_0^* - G^*\right) - C_0^*, {S_1}^{2\alpha-1} R D_F \left(1 - \lambda\right) = C_1^* - {S_1}^{-(1-\alpha)} Y_1^*. (18)$$

According to (18) there are four balances of payment constraints (two countries $\times$ two periods). However, owing to Walras' Law one pair of these constraints is redundant (we have chosen this to be the pair of constraints for the Foreign country, see Appendix). Given that C_t and C_t^* are determined by the subsystem (9), the set of thirteen equations of equations in (11, 12, 14, 16 and 18) can be solved for the thirteen dependent variables, S_0, S_1, R, R^*, D, D^*, T, T^*, U, U^*, D_F^*, D_F and D_H.

3.4 Calibration and Baseline Solution

The parameters in the system are calibrated as follows. First, the elasticities of intertemporal substitution $1/\sigma$ and $1/\eta$ are fixed at 4 as proposed by Barro (2009) (see also Havranek et al., 2014). In line with the convention for computable general equilibrium models and in accordance with findings from studies by Meyer (2013) and Yao et al (2012) we fix the discount factor β at 0.90. We fix the degree of Home bias α at $\frac{2}{3}$ in line with estimates for the import shares of final expenditure for a large sample of countries reported by the WTO (see Auboin & Borino, 2022). For real endowments we assume that $Y_t = Y_t^* = 1$.

In symmetric equilibrium the weight of the demand for the Home country's debt in utility of Foreign households is $\gamma = 0$, which implies that $D_F = 0$. If the levels of real government expenditure G and G^* are fixed at 0.25 (which means that each government runs a cumulative budget deficit of 25% of output in period 0), we find that $R = R^* = 1.194$, $S_0 = S_1 = 1$, $T = T^* = 0.298$, $D = D^* = 0.25$, $C_0 = C_0^* = 0.75$, $C_1 = C_1^* = 1$.

Shock experiments conducted with two-by-two models are typically assessed against symmetric equilibrium. However, in our case the appropriate baseline is fundamentally asymmetric, with one country providing the global currency and reserve asset in which the Foreign country invests. Therefore, we need to construct an appropriate baseline in which Foreign households derive utility from holding Home country debt ($\gamma > 0$ and $D_F > 0$). While the assumption that $\gamma > 0$ adds significant complexity to the model, it can still be solved numerically without a need to resort to log-linear approximations (see Appendix I).

In Fig. 3 we report the results for $\gamma = 0.1$ in terms of differences from symmetric equilibrium, from which the following can be inferred:

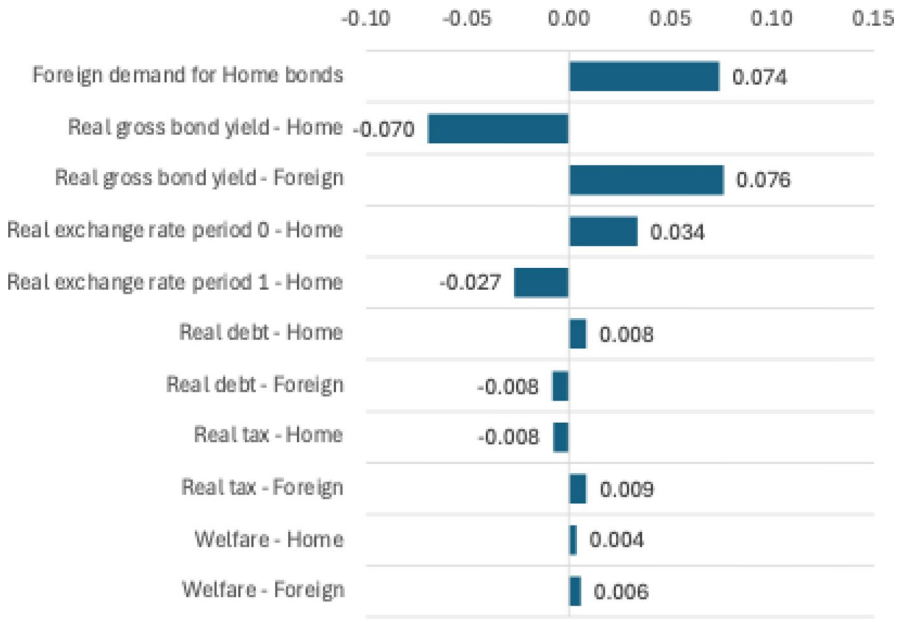

Fig. 3 Baseline—deviations from symmetric equilibrium. Source: Authors' computations using the model in the Appendix

1. The Foreign demand for Home country debt D_F would be around one-quarter of total debt issued by the Home country D;
2. The spread between real yields in the Foreign (R^*) and Home (R) countries amounts to around 15 percent-points, which—if each period is assumed to span a decade—would be equivalent to roughly 1½ percentage-point per annum. The Home country's real exchange rate gauged by Eq. (15) appreciates by over 3% in period 0 and depreciates by slightly less in period 1. All this is in the ballpark of findings in the mainstream literature (see for instance Habib, 2010);
3. Importantly, welfare in both the Home (U) and Foreign (U^*) country increases. This is essentially the result of a transfer of consumption from the future to the present in the Home country, owing to the lower real interest rate, and the convenience yield on Home country debt absorbed by the Foreign country. This is again in the ballpark of findings in the mainstream literature (see for instance Kannan, 2009).

4 Shock Experiments

The shock experiments reported in this section are evaluated against the baseline developed in the previous section. Therefore, all impact responses should be read as changes relative to this baseline. Three experiments are conducted: *(i)* a combination of fiscal stimulus and faster economic growth in the Home country; *(ii)* geo-economic

fragmentation reflected in stronger home bias of consumption in both countries; and *(iii)* a default on foreign-held public debt issued by the Home country.

4.1 Fiscal Exuberance and Buoyant Growth in the Home Country

According to our baseline, the reserve currency issuer (the Home country) enjoys a lower real interest rate than the lender country does, due to the transfer of capital from the latter to the former. However, this outcome is somewhat at odds with actual developments in real interest rate since the mid-2010s, when measures of the "natural" rate in the United States have exceeded those in Europe.[6] We think this is attributable to a combination of two stylised developments: *(i)* the more rapid (realised or expected) economic growth in the United States due to a favourable productivity shock (e.g. the emergence of Big Tech), and *(ii)* the ability of the United States to run expansionary fiscal policies without triggering an adverse reaction of foreign lenders (see Subacchi & Van den Noord, 2023 for empirical evidence).

To mimic this possibility, we have run a shock scenario whereby the Home country government raises expenditure by 0.05 (from $G = 0.25$ in the baseline, so an increase of 20%) while output in period 1 is raised by 0.1 (from $Y_1 = 1$ in the base-

[6] The natural interest rate is the real interest rate consistent with the economy being in equilibrium and in the absence of monetary policy stimulus or restraint – see for empirical estimates IMF (2023).

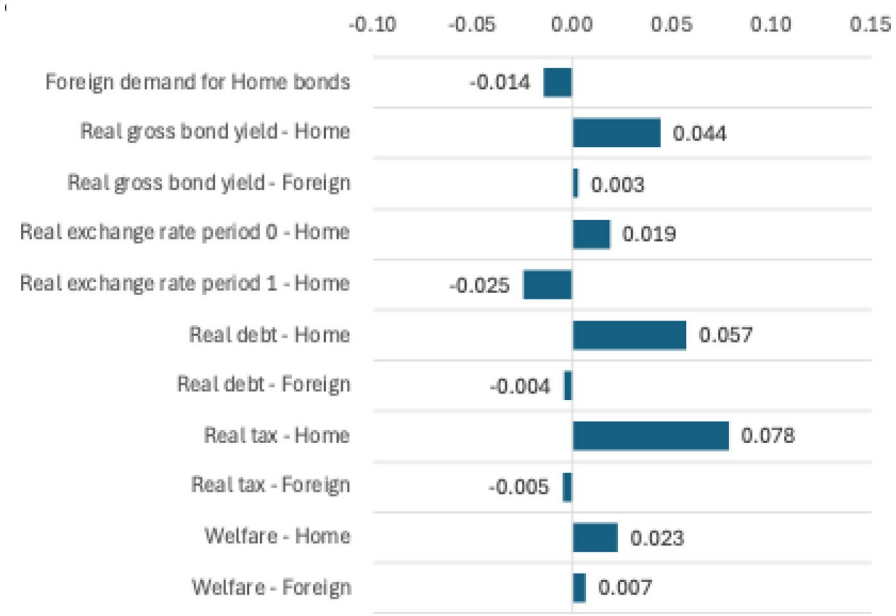

Fig. 4 Shock experiment 1—Buoyant growth and fiscal exuberance in the Home country. Source: Authors' computations using the model in the Appendix

line, hence a 10% increase). From the impact responses reported in Fig. 4 the following can be inferred:

1. Most of the fall in real yields attributed to the Home country issuing the reserve asset is reversed, with virtually all its fiscal space (including that created by faster economic growth) being 'consumed';
2. The Home country's real exchange rate strengthens in period 0, necessary to squeeze endowments now being allocated to the demand for goods by the government. Its real exchange rate weakens in period 1, however, as foreign-held debt is repaid at a larger gross rate of return, even if the foreign demand for this debt is somewhat smaller compared to baseline.
3. Both countries see their welfare increase further, essentially because the positive supply shock in the Home country enables households in both countries to increase their consumption levels.

4.2 Trade Barriers and Geo-economic Fragmentation

Numerous factors have been pushing the world economy towards geo-economic fragmentation in response to disruptions in supply chains and security considerations, including the global financial crisis of 2007–2009, trade policies during the first Trump administration, and the COVID-19 pandemic (Subacchi & Van den Noord, 2025a).

With the global economy thus headed for more geo-economic fragmentation, we use the model to examine what this might imply for the main global reserve asset and its repercussions for real interest rates and exchange rates. We gauge geo-economic fragmentation in the model by increasing the degree of home bias in the intra-temporal utility functions from $\alpha = \frac{2}{3}$ to $\alpha = \frac{4}{5}$. The shock responses are depicted in Fig. 5, from which can be inferred that:

1. Foreign demand for Home bonds (D_F) shrinks considerably, more than halving compared to baseline. This is due primarily to a much more unfavorable development of the Home country's real exchange rate (a stronger appreciation in period 0 followed by a stronger depreciation in period 1), which represent a valuation loss on these bonds for foreign investors. This stronger appreciation in period 0 is necessary since the Home country's trade deficit has become less sensitive to changes in the real exchange rate—and conversely for the trade surplus and depreciation in period 1.
2. This exchange rate effect is strong enough to more than offset the impact of the more favorable real interest rate on Home country debt relative to that of the Foreign country on the attractiveness of the reserve asset for foreign investors. This explains the combination of higher comparative yields on the reserve asset ($R > R^*$), a weaker time profile of the Home country's real exchange rate (S_1/S_0 falls more strongly), and a weaker demand for the reserve asset (D_F falling relative to baseline).
3. The Foreign country now suffers a welfare loss relative to baseline, essentially due to a combination of lower consumption, notably in period 1 when it earns a lower

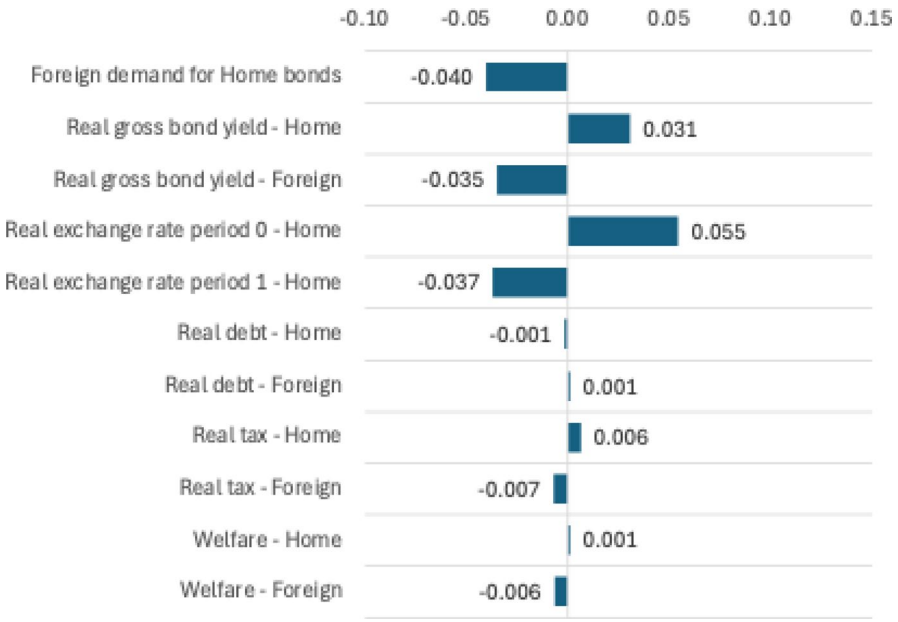

Fig. 5 Shock experiment 2—Trade barriers and geo-economic fragmentation. Source: Authors' computations using the model in the Appendix

gross return on its foreign assets, and a smaller convenience yield on these assets. The Home country would enjoy a (small) welfare gain in this shock scenario, though a robustness check (see below) raises doubts about this effect.

4.3 Default on Home Country Foreign-Held Debt

Owing to network effects the risk of a sudden global shift away from US debt is low. But this stability presupposes that confidence in US public debt is preserved. In the current context of sharply rising political and institutional uncertainty, this is hardly a foregone conclusion (see Subacchi & Van den Noord, 2025b). Holding this debt could become less attractive if this entails a larger risk of default.[7] Reductions in reserve asset holdings could push their yield higher, weaken the US exchange rate, and, ultimately, threaten the stability of the international financial system. If investors abandon US debt altogether, the status as the world's leading reserve currency would be in jeopardy (though the currency might still be used for international trade transactions).

To incorporate these possible developments in our model, we have introduced the risk factorλ. So far, we have assumed that$\lambda = 0$, but in this shock experiment we raise it to $\frac{1}{5}$ (we leave it open whether this means that the Home country fully defaults on its foreign-held debt with a probability $p = \frac{1}{5}$ or that it applies a haircut of $\frac{1}{5}$ with

[7] Under this risk we include the arbitrary extension of the maturity of foreign-held US government debt as well as the arbitrary withholding tax on such debt, as suggested in the Mar-a-Lago Accord.

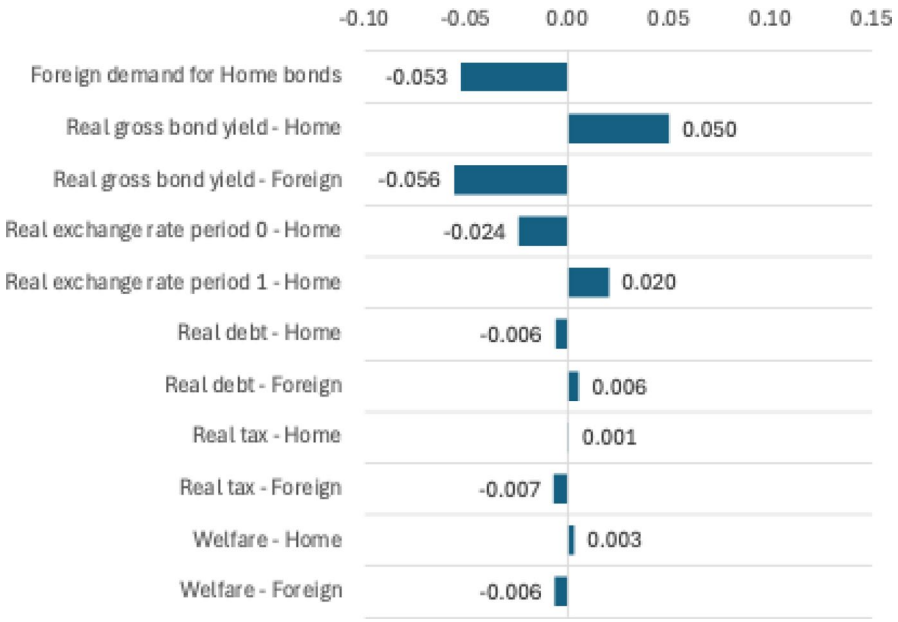

Fig. 6 Shock experiment 3—Default on home country foreign-held debt. Source: Authors' computations using the model in the Appendix

a probability $p = 1$, or any other combination of probability and loss given default). The shock responses are depicted in Fig. 6, from which we infer that:

1. Foreign demand for Home country debt (D_F) again shrinks considerably, but unlike the previous simulation, this is coupled with a real depreciation of the reserve currency in period 0 and an appreciation in period 1 (relative to baseline). Again, the real yield on Home country debt increases relative to Foreign country debt. This combination of outcomes is what one normally finds in case of a capital flight from the debtor country (in this case the Home country), even if itis unusual for the reserve currency issuer experiencing capital flight.
2. Not that surprisingly, in this case the Foreign country suffers a welfare loss which is essentially due to the loss of convenience yield as holdings of the reserve asset shrink. The Home country would enjoy a welfare gain, though this is smaller than the welfare loss in the Foreign country. It is worth noting, however, that this positive welfare effects is likely to disappear if the direct cost of default (such as reputational loss), is included (Borensztein & Panizza, 2008). Moreover, the robustness checks reported below suggest that also in our model the sign of this welfare effect turns negative for larger default shocks. This broadly concurs with Bianchi and Sosa-Padilla (2025) who find negative welfare effects of sanctions on both the debtor and creditor country.

4.4 Robustness Checks

So far, we have relied on a numerical calibration to establish our results, and therefore a robustness check is necessary to verify that the qualitative results hold more generally. In Appendix II we report the results of a Monte Carlo experiment in which we randomly draw thirty sets of parameter values within their plausible ranges and run the model for each draw. We then compute the mean and standard deviation for each endogenous variable and check if the order of magnitude remains in the ball bark and if the risk of the sign switching is significant.

The results indicate that the magnitudes and directions of the impact responses remain largely in line with the calibrated model, except for the welfare effects on the Home country in shock experiment 2 (trade barriers and geo-economic fragmentation), which may be negative while the calibrated version of the model indicates that it would be positive. This is an important finding in the sense that there would be a significant risk that the Home country inflicts damage onto itself through its trade policy.

The simulations with the calibrated parameters suggest that a default on foreign debt of the Home country (shock experiment 3) would have a beneficial effect on its welfare. However, this looks at odds with the finding of Bianchi and Sosa-Padilla (2025) that sanctions would have a negative welfare effect on the United States. We have checked whether our result holds also for larger values of the default risk parameter λ. This turns out not to be the case: for larger values of λ (higher risk of default) the sign switches and hence the welfare effect on the Home country turns negative, in line with the findings of Bianchi and Sosa-Padilla (2025).

4.5 Discussion

Since a combination of shocks of the kind we have modelled has occurred or may occur, it may be useful to examine what their comparative impact might be on key macroeconomic variables. Table 1 compares the various shocks along with the baseline, whereby 'comparatively large' effects are indicated by −− or ++ and 'comparatively small' effects by – or +. If the robustness checks suggest that the impact is ambiguous, this is indicated by ±.

The key result of interest relates to the demand for reserve assets by the Foreign country, which indicates that likely the bulk of the demand for these assets would be erased by the shocks we have examined, though for different reasons. Fiscal exuberance in the Home country and geo-economic fragmentation both produce an adverse development of the reserve currency's real exchange rate (appreciation in period 0 and depreciation in period 1) which weigh heavily on the convenience yield of holding reserves. By contrast, a risk of default on the reserve asset for foreign holders affects the demand adversely for these assets more directly, more than offsetting the capital gain on these holdings due to the real exchange rate depreciating in period 0 and appreciating in period 1. Meanwhile, in all shock scenarios the Home country's real interest rate increases, thus reversing some or all the 'exorbitant privilege' effect.

In terms of welfare, only in shock experiment 1 both countries unambiguously benefit. In the trade restraint scenario 2 and in the default risk scenario 3 the Foreign

Table 1 Summary of results

	Baseline[a]	Shock experiments[b]		
		Buoyant growth/fis-cal expansion Home	Home bias in trade both countries	Default on Foreign-held debt Home
Foreign demand Home debt (D_F)	++	−	−	−
Real interest rate Home (R)	−	++	++	++
Real interest rate Foreign (R^*)	++	+	−	−
Real exch. rate period 0 (${S_0}^{2\alpha-1}$)	++	++	++	−
Real exch. rate period 1 (${S_1}^{2\alpha-1}$)	−	−	−	++
Welfare Home (U)	+	++	±	±
Welfare Foreign (U^*)	+	+	−	−

Source: Authors' computations using the model in Appendix I

Notes: *a)* changes from symmetric equilibrium; *b)* changes from baseline

country suffers a welfare loss mostly because of the loss of convenience yield. By contrast, there would be a welfare gain in the Home country in those scenarios. This results from the reduction in foreign debt and the associated expansion of consumption in period 1. In the final shock scenario (default on foreign-held debt) this is essentially the result of the forced transfer of resources from Foreign to Home in period 1. However, the robustness checks conducted give rise to doubt about this positive welfare effect.

5 Conclusions

The paper examines possible triggers that could undermine the (asymmetric) equilibrium of the international monetary system, by eroding the global role of the dollar and the associated "exorbitant privilege". Using a two-period, two-country general equilibrium model, we analyze three potential shocks: fiscal expansion combined with productivity growth in the United States, increased trade barriers and geo-economic fragmentation, and heightened default risk on foreign-held US sovereign debt.

Our analysis shows that a combination of trade restrictions and default risk could largely erase European demand for US Treasuries. Applied to the current context, these results have important policy implications for whether US Treasuries continue to function as store of value for European investors. This question is particularly relevant given the new risks arising from the Trump administration's fiscal and trade policies, including the possibility of default or partial default on the US foreign lia-

bilities—as suggested by Stephen Miran (2024), a Trump-appointed Member of the Federal Reserve Board of Governors.

These policies pose direct challenges to the "steady disequilibrium" on which the international monetary system rests (Subacchi & Vines, 2023). As the paper argues, this system is underpinned by the fundamental asymmetry that comes from the dollar—a currency issued by a sovereign state bound to its domestic priorities—as the main provider of liquidity and safe assets. The dollar's "exorbitant privilege", whereby the US can borrow cheaper than the rest of the world, epitomizes this asymmetry.

This asymmetry remains manageable as long as the rest of the world continues to buy US Treasuries, allowing the rollover of US federal debt. China's diversification away from dollar holdings has so far had limited impact, partly because European investors have picked up the slack.[8] However, as China continues to diversify its dollar holdings for both financial and geopolitical reasons, an important question arises, that is whether European dollar holders should maintain their exposure or reduce their flows into the US Treasury market in step with China.

If indeed European investors reduce their exposure to US Treasuries, this may be an opportunity for Europe to provide alternative safe assets and encourage domestic investors to hold European debt. Whether this opportunity can be seized, however, depends on conditions that Europe has yet to meet. The dollar's reserve status rests not merely on the size of the US economy but on the depth, homogeneity and unquestioned convertibility of the asset that backs it. For the euro to assume an analogous role, the European Union would need to issue debt that is liquid, deep and easily convertible into the global currency without exchange-rate or redenomination risk—that is, a genuinely common safe asset, in sufficient scale, supported by integrated repo and derivatives markets, and underwritten by a credible fiscal backstop (see e.g. Darvas et al., 2025). Fragmented national debt markets, even taken together, cannot perform this function: they are priced at heterogeneous spreads and remain exposed to country-specific risk.

Until these conditions are met, there is no real alternative to the US-provided safe asset, and the convenience yield modelled in this paper will continue to accrue to US Treasuries by default. The implication is that the shocks we have examined are more likely to manifest, in the first instance, as higher US real yields and a weaker dollar–a partial reversal of the exorbitant privilege—than as an outright reallocation of European savings into euro-denominated reserves. The asymmetry of the international monetary system may lose its sharp edges; in the absence of a credible euro safe asset, it is not yet being replaced.

Appendix I—The Full Model

After some rearrangement and removal of redundancies the full model reads as follows.

Intra-temporal allocation:

[8] With the caveat we address in note 2.

$$C_0 = \frac{\alpha {S_0}^{1-\alpha} (Y_0 - G) - (1-\alpha) {S_0}^{-\alpha} (Y_0^* - G^*)}{2\alpha - 1}, C_1 = \frac{\alpha {S_1}^{1-\alpha} Y_1 - (1-\alpha) {S_1}^{-\alpha} Y_1^*}{2\alpha - 1},$$

$$C_0^* = \frac{\alpha {S_0}^{-(1-\alpha)} (Y_0^* - G^*) - (1-\alpha) {S_0}^{\alpha} (Y_0 - G)}{2\alpha - 1}, C_1^* = \frac{\alpha {S_1}^{-(1-\alpha)} Y_1^* - (1-\alpha) {S_1}^{\alpha} Y_1}{2\alpha - 1},$$

Intertemporal allocation:
Household sectors:

$$R = \frac{1}{\beta}\left(\frac{C_1}{C_0}\right)^{\sigma}, R^* = \frac{1}{\beta}\left(\frac{C_1^*}{C_0^*}\right)^{\sigma}, D_F = \frac{\gamma^{\frac{1}{\eta}} C_0^{*\frac{\sigma}{\eta}}}{{S_0}^{\frac{2\alpha-1}{\eta}} \left[1 - \left(\frac{S_1}{S_0}\right)^{2\alpha-1} \frac{R(1-\lambda)}{R^*}\right]^{\frac{1}{\eta}}},$$

Government sectors:

$$D = G{S_0}^{1-\alpha}, T = R(D - \lambda D_F), D^* = G^* {S_0}^{-(1-\alpha)}, T^* = R^* D^*, D_H = D - D_F,$$

External sector:

$$\overline{D}_F = C_0 - {S_0}^{1-\alpha}(Y_0 - G), \overline{\overline{D}}_F = \frac{{S_1}^{1-\alpha} Y_1 - C_1}{R(1-\lambda)},$$

$$e_0 \frac{P_0}{P_0^*} = {S_0}^{2\alpha-1}, e_1 \frac{P_1}{P_1^*} = {S_1}^{2\alpha-1}.$$

Welfare:

$$U = \sum_{t=0,1} \beta^t \frac{{C_t}^{1-\sigma}}{1-\sigma}, U^* = \sum_{t=0,1} \beta^t \frac{{C_t^*}^{1-\sigma}}{1-\sigma} + \gamma \frac{{D_F}^{1-\eta}}{1-\eta}.$$

To solve this system, we treat S_0 and S_1 as quasi-exogenous instruments (which renders the system recursive), and iterate until $D_F - \overline{D}_F$ and $D_F - \overline{\overline{D}}_F$ have converged to zero.

Appendix II—Robustness Checks

We check the impact of random changes to the key parameters α, β, γ, σ and η. We draw random numbers for each parameter from a range of $\pm 1.5 \times$ the calibrated value in the cases of γ, σ and η and a range of $\pm 1.1 \times$ the calibrated value in the cases of α , and the calibrated value ± 0.05 in the case of β. In the case of shock experiment 2 the increase in α is proportional to the increase of α in the original shock experiment using the calibrated model. There are thirty sets of random values within these ranges selected and for each set the baseline simulation and shock experiments are run. For

each endogenous variable in the model the mean and standard deviation for these thirty simulations are computed, which are reported in Table 2 for the variables D_F, R, R^*, ${S_0}^{2\alpha-1}$, ${S_1}^{2\alpha-1}$, U and U^*. If 0 lies within one standard deviation below or above the mean, we conclude that there is a significant risk that the impact-response switches sign. This turns out to be never the case except for the welfare in the home country of the trade shock (shock experiment 2)—i.e. there is a significant risk that welfare in the Home country suffers from trade restraint.

We also check whether the impact-response of welfare in the Home country switches sign if we assume the default risk λ to be larger than the assumption that $\lambda = 0.2$. As reported in Table 3, if $\lambda = 0.3$ the welfare effect on the Home country is nil while for larger values of λ this welfare effect is negative.

Table 2 Robustness check parameter values

	Baseline[a]	Shock experiments[b]		
		Buoyant growth/ fis-cal expansion Home	Home bias in trade both countries	Default on Foreign-held debt Home
Foreign demand Home debt (D_F)				
Calibrated	0.074	−0.014	−0.040	−0.053
Random—Mean	0.079	−0.014	−0.042	−0.056
Random—Standard deviation	0.029	0.003	0.016	0.022
Real interest rate Home (R)				
Calibrated	−0.070	0.044	0.031	0.050
Random—Mean	−0.072	0.045	0.030	0.052
Random—Standard deviation	0.023	0.011	0.008	0.018
Real interest rate Foreign (R^*)				
Calibrated	0.076	0.003	−0.035	−0.056
Random—Mean	0.080	0.005	−0.035	−0.059
Random—Standard deviation	0.028	0.006	0.010	0.021
Real exch. rate period 0 (${S_0}^{2\alpha-1}$)				
Calibrated	0.034	0.019	0.055	−0.024
Random—Mean	0.036	0.018	0.059	−0.027
Random—Standard deviation	0.019	0.003	0.024	0.014
Real exch. rate period 1 (${S_1}^{2\alpha-1}$)				
Calibrated	−0.027	−0.025	−0.037	0.020
Random—Mean	−0.028	−0.024	−0.040	0.022
Random—Standard deviation	0.013	0.004	0.012	0.010
Welfare Home (U)				
Calibrated	0.004	0.023	0.001	0.003
Random—Mean	0.005	0.021	−0.002	0.002
Random—Standard deviation	0.004	0.003	0.001	0.004
Welfare Foreign (U^*)				
Calibrated	0.006	0.007	−0.006	−0.006
Random—Mean	0.007	0.009	−0.005	−0.006
Random—Standard deviation	0.005	0.002	0.004	0.004

Source: Authors' computations using the model in Appendix I

Notes: *a)* changes from symmetric equilibrium; *b)* changes from baseline

Table 3 Robustness check of the impact of default in the Home country[a]

$\lambda =$	0.2	0.3	0.4	0.5
Foreign demand Home debt (D_F)	−0.053	−0.066	−0.071	−0.073
Real interest rate Home (R)	0.050	0.063	0.067	0.069
Real interest rate Foreign (R^*)	−0.056	−0.069	−0.074	−0.075
Real exch. rate period 0 (${S_0}^{2\alpha-1}$)	−0.024	−0.030	−0.032	−0.033
Real exch. rate period 1 (${S_1}^{2\alpha-1}$)	0.020	0.025	0.026	0.027
Welfare Home (U)	0.003	0.000	−0.002	−0.002
Welfare Foreign (U^*)	−0.006	−0.006	−0.006	−0.006

Source: Authors' computations using the model in Appendix I

Notes: *a)* changes from baseline

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Declarations

Conflict of interest Not applicable.

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