Financial Repression and the Currency Market under Sanctions*

Oleg Itskhoki
itskhoki@fas.harvard.edu

Dmitry Mukhin
d.mukhin@lse.ac.uk

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Abstract

Tariffs, trade wars, and financial sanctions have become a common feature of the global economy. In response, many governments consider departing from the Washington Consensus and adding unconventional tools such as foreign exchange interventions, capital controls, and financial repression. This paper asks when, and how, financial repression can be used in the currency market, and how it compares with FX interventions and conventional monetary and fiscal policy. We show that although the use of financial repression is welfare-reducing in response to international shocks even when FX interventions are fully constrained, it can be effectively used for redistributive and fiscal reasons. Greater international financial isolation makes financial repression more potent in extracting fiscal surplus from the private sector.

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1 Introduction

Tariffs, trade wars and financial sanctions have become a common part of the international economic landscape in the last ten years after a period of globalization since the end of the Cold War. To mitigate the effects of these external shocks, governments across the world consider deviating from the Washington Consensus and using unconventional policy tools, including foreign exchange (FX) interventions, capital controls, and financial repression. This raises the question about the welfare and allocative consequences of these policies and their effectiveness in mitigating the effects of external shocks. In this paper, we focus on arguably the most understudied instrument from this toolkit — financial repression in the currency market — and revisit the following questions: What macroeconomic policies can be classified as financial repression? How do they propagate in the economy and what equilibrium allocations can they sustain? Finally and most importantly, what is the optimal use of financial repression: should it be part of a macrostabilization toolkit or is it dominated by other instruments? Can the use of such policies be rationalized by sanctions shocks or other geoeconomic considerations?

This paper aims to answer these questions in a context of a simple analytical model. In particular, we consider a small open economy subject to trade and financial shocks that can be interpreted as sanctions and tariffs. There are two main frictions in the economy — sticky prices and segmented currency market. Households get non-pecuniary benefits from holding foreign currency that give rise to a downward-slopping demand in the currency market. Four policy tools are available to the policymaker: conventional monetary and fiscal policies, FX interventions, and financial repression. The latter is defined as a gap between the interest rates on foreign deposits within the economy and abroad and arises due to the financial market segmentation. Such segmentation can arise both as a result of market frictions and of government policies such as capital controls or international financial sanctions.

We start with the positive analysis and characterize the set of equilibria that can be implemented with these policy instruments. In particular, we show that both FX interventions and financial repression can be used to offset currency demand shocks and affect the path of the real exchange rate. However, the two instruments are not equivalent from the normative perspective: while FX reserves can be used to saturate household demand for foreign-currency deposits, financial repression only suppresses this demand and results in lower welfare. Consequently, the optimal policy mix includes inflation targeting by monetary policy and accommodation of currency demand shocks with FX interventions, but no use of financial repression. The two policy instruments are sufficient to implement the first-best allocation. The result is fairly general and describes the optimal response to any shock including foreign tariffs and sanctions.

Moving beyond the first best, we then consider the case of constrained FX interventions whether due to limited FX reserves or due to international sanctions on the central bank. While

the government can potentially circumvent those constraints by offering synthetic FX deposits that are not backed by holdings of foreign assets, this results in a currency mismatch on its balance sheet. Should financial repression be used to substitute FX policy and offset currency demand shocks? Perhaps surprisingly, we show that this is not the case and financial repression is not warranted even as a second-best tool. Intuitively, in the absence of FX reserves, demand for currency can only be accommodated by accumulating export revenues and temporary cutting spendings on foreign goods. Although there exists an effective trade-off between demand for imported goods and demand for currency as a savings vehicle, it is fully internalized via the equilibrium exchange rate. As a result, there is no externality to be addressed by the government.[1]

Finally, we show that while financial repression is not an effective policy tool from the perspective of aggregate welfare, it does enter the policy mix for redistributive reasons when tax instruments are constrained. In particular, we identify two cases when lump-sum transfers are not available and financial repression becomes a useful tool for redistribution. In particular, such motive arises in a version of our model with heterogeneous agents. Even with the same aggregate response to shocks as in a representative-agent model, the normative implications are quite different when hand-to-mouth households consumer, in part, the imported good and the unconstrained Ricardian households purchase foreign currency mainly as a store of value. Because Ricardian agents do not internalize the effects of their purchases on other households, and the government cannot use lump-sum transfers, repressing demand for currency is generally optimal for a utilitarian planner. This alleviates the depreciation pressure on the domestic currency and increases the purchasing power of the hand-to-mouth agents.

Furthermore, financial repression can be used to shift resources from households to the government when less distortionary taxes are not available. Two channels are at play here. First, facing a downward-slopping household demand for foreign currency, the government can collect seignorage by lowering returns on FX deposits. We characterize the optimal seigniorage policy in the currency market. Second, we show that the government can reduce the amount of financial repression to depreciate the real exchange rate and boost fiscal revenues from the export sector. Interestingly, such policy provides only a temporal relief: because the long-run value of the exchange rate is pinned down by the country's intertemporal budget constraint, variation in the extent of financial repression can only redistribute tax revenues across periods, but does not change their net present value.

Before setting up the model and characterizing optimal policies, we begin in Section 2 with an overview of both theory and practice of financial repression. We start with a comparison of a narrow view of financial repression as a set of policies that compel domestic creditors, especially

[1]This is a rather general results with the underlying assumption being that there is no externalities associated directly with the value of the exchange rate such as, for example, the FX debt overhang of the private sector that leads to inefficient default.

banks, to hold domestic government debt, with the expanded view whereby financial repression extends to other asset markets, and in particular the currency market. We provide a review of the academic literature as well as an account of the policies used in different countries, both in advanced economies and in emerging markets. Our main theoretical results are contained in Sections 3 and 4. Section 5 provides a quantitative history of financial repression in Russia since the invasion of Ukraine in 2022 and the imposition of Western sanctions.

This paper contributes to the growing literature on the economic effects of sanctions and optimal policy responses. The recent theoretical and empirical studies of sanctions include Itskhoki and Mukhin (2025b), Lorenzoni and Werning (2022), Clayton, Maggiori, and Schreger (2023), Broner, Martin, Meyer, and Trebesch (2025), Becko (2024), Egorov, Korovkin, Makarin, and Nigmatulina (2025), Krahnke, Ferrari Minesso, Mehl, and Vansteenkiste (2024) and Mohr and Trebesch (2025). Our analysis is related to recent work on exchange rate policies by Itskhoki and Mukhin (2023b), Basu, Boz, Gopinath, Roch, and Unsal (2020), Kalemli-Özcan (2019), Amador, Bianchi, Bocola, and Perri (2019), Fanelli and Straub (2021), Itskhoki and Mukhin (2025a) and optimal capital controls by Jeanne and Korinek (2010), Bianchi (2011), Costinot, Lorenzoni, and Werning (2014), Farhi and Werning (2016), Schmitt-Grohé and Uribe (2016). Related work on FX interventions, capital controls, and financial repression includes Obstfeld, Shambaugh, and Taylor (2010), Magud, Reinhart, and Rogoff (2018), Chari, Dovis, and Kehoe (2020), Chien, Cole, and Lustig (2025), Schmitt-Grohé and Uribe (2024).

2 Financial Repression: Theory and Practice

Narrow view The main view of *financial repression*, introduced by McKinnon (1973) and Shaw (1973), focuses on a set of policies that compel domestic creditors — specifically banks — to hold domestic government debt. These policies include interest rate ceilings, reserve requirements, bank regulation, and other forms of state influence on banks. The direct effect of these policies is to allow the government to borrow at below-market rates, and the aim of these policies is to redistribute resources away from the private sector and towards the government sector, increasing the government's fiscal capacity and allowing for larger fiscal expenditures and deficits.

Giovannini and de Melo (1993) provide one of the first systematic empirical estimates of how much revenue governments extract through financial repression, treating repression as an implicit form of taxation on domestic financial assets, either via an inflation tax or a wedge on returns. Reinhart and Sbrancia (2015) and Reinhart, Reinhart, and Rogoff (2015) document the ubiquitous use of various forms of financial repression to reduce and restructure large public-debt burdens, in particular by developed countries in the aftermath of the World War II. This year's IMF Mundell-Fleming lecture by Reis (2025) returns focus to such financial repression policies

and its potential use in the current high-debt environment in developed countries.

A natural consequence of such financial repression policies is an underdeveloped or repressed financial system that traps economies in a low-saving, low-investment equilibrium as below-market returns discourage financial intermediation and reduce the size and productivity of the banking system, as well as crowd out the use of savings for productive investment. The central policy implication is that financial liberalization and positive real interest rates promote *financial deepening*, increasing the supply of loanable funds and raising investment and growth.[2]

In recent theoretical work, Chari, Dovis, and Kehoe (2020) argue that financial repression is never optimal under commitment or in normal times, as it crowds out private investment, but it allows governments to credibly issue unusually large amounts of debt in times of crisis. Bassetto and Cui (2024) use a Ramsey framework in which financial distortions act like implicit taxes, showing how optimal policy determines their dynamic behavior in economies with constrained financial markets. Broner, Erce, Martin, and Ventura (2014) show that during periods of sovereign stress, governments rely disproportionately on domestic creditors, who are less able to exit and therefore accept lower expected returns relative to foreign investors. This creditor discrimination crowds out private domestic borrowing and amplifies the domestic financial cycle, making sovereign risk more damaging for the domestic economy.[3]

Expanded view An expanded view of financial repression goes beyond government debt, fiscal deficits, and the banking sector, and focuses on a broader class of related policies that aim to also affect the current account and the currency market. Such policies may repress consumption and encourage, or force, private savings to improve the current account and trade balance and depreciate the real exchange rate. Another set of policies may prevent capital outflows or curb capital inflows, working alongside *capital controls* (see, e.g., Magud, Reinhart, and Rogoff 2018).

While capital controls are applied to the cross-border transactions (e.g., capital inflows and outflows driven by either foreign or home agents), financial repression policies focus on savings and investment in the domestic financial market. One particular dimension of the domestic financial market is the currency market, where foreign currency can be scarce or abundant, putting pressure on the exchange rate. Financial repression can alleviate such pressures by encouraging or discouraging domestic private savings in foreign currency — by firms or households — complementing the use of *FX interventions*, which correspond to *public* (dis)saving in foreign currency.

Our analysis focuses on this latter form of financial repression in the domestic currency mar-

[2]This is, of course, relevant when savings are scarce and high-return opportunities are favored by investors over the safety of government debt. Arguably, this has been the case during the periods of financial repression in the 20th century, while the beginning of the 21st century featured a situation of scarcity of and inelastic demand for save assets (see, e.g., Caballero 2015), making financial repression both more potent and less distortionary.

[3]See also Jeanne (2025) for the model of stages of financial repression of banks depending on the amount of sovereign debt outstanding.

ket, sometimes referred to as *currency controls*. This policy overlaps with the two other forms of financial repression: namely, policies aimed at consumption-savings decision and current account, and policies that reallocate resources from the private sector to the government to ease fiscal constraints. We examine when financial repression of the domestic currency market has temporary or permanent fiscal consequences, as well as when it affects trade balance and current account. Finally, the (real) exchange rate may either be an explicit policy target or an endogenous outcome of financial repression in the domestic currency market.

In the related literature, Obstfeld, Shambaugh, and Taylor (2010) consider the risk of a *double drain* scenario where consumers run on domestic banks then exchange their deposits for foreign currency. Such a risk motivates the government to either hold excessive FX reserves to defend the currency or recur to financial repression in the banking sector and/or in the currency markets. Schmitt-Grohé and Uribe (2024) study exchange rate controls in an economy with a black currency market, which can act as a (highly distortionary) source of government revenues in the form of an export tax.

Financial repression around the world We discuss the cases of use of financial repression, and the rationales given by policy makers, in different scenarios around the world. During the post-war period, financial repression was ubiquitous in advanced economies including in the *United States*. For example, the US prohibited interest payments on demand deposits and set limits on the interest rates for savings deposits between 1933 and 1986 under Regulation Q (Gilbert 1986). These ceilings were accompanied by capital controls that prevented consumers from easily moving funds to higher-yield savings abroad. Reinhart and Sbrancia (2015) show that such tools resulted in frequent negative real interest rates that facilitated government deficits, a classic channel of financial repression.

A large recent literature on financial repression has emerged following the *European* debt crisis of 2010-12. Before and during the crisis, banks' sovereign debt holdings were strongly biased towards their home country, especially if the country was more risky or held an ownership stake in the bank (Horváth, Huizinga, and Ioannidou 2015, De Marco and Macchiavelli 2016). Banks were more likely to increase their holdings of government debt when their government needed to roll over maturing debt, a telltale sign of repression (Ongena, Popov, and Van Horen 2019). Moreover, many weakly-capitalized banks used the ECB's lender-of-last-resort facilities to purchase their own sovereign's debt, representing a transfer from strong to weak banks (Drechsler, Drechsel, Marques-Ibanez, and Schnabl 2016). Using lending micro-data, Becker and Ivashina (2018) find that financial repression in the Euro area lead to crowding-out of corporate lending within affected countries. Chien, Jiang, Leombroni, and Lustig (2025) compute the cross-country

transfers that result from unconventional monetary policy in the Eurozone.[4]

Japan, another advanced economy, has historically engaged in direct financial repression policies, but now instead accomplishes the same goal indirectly using the central bank balance sheet and yield curve control policies (Chien, Cole, and Lustig 2025). Taking advantage of strong home bias — arising from low financial literacy and small retail investing penetration — and policies that encourage banks to accumulate reserves at the central bank, the Japanese public sector is able to borrow aggressively in short-term markets at low rates and invest in high-risk long-term assets via investment vehicles such as the Government Pension Investment Fund. This effectively depresses domestic interest rates and results in financial redistribution towards the public sector that uses the funds to finance the expansive social security and pensions systems.

Perhaps a leading emerging market and transition economy example, *China* has long relied on a systematic regime of financial repression to channel household savings toward state priorities, including to state-owned enterprises, and to keep sovereign and bank funding costs low. Core mechanisms include strict capital controls, administrative caps on deposit and lending rates, high and targeted reserve requirements, and tight regulation of banks and institutional investors, which — combined with limited household investment alternatives — create a captive domestic savings base (Prasad and Wei 2010, Hsu and Li 2015). In addition, China has historically combined capital account restrictions with instruments that directly alter the domestic pricing of foreign currency. The impact of these policies is apparent in the persistent spread between onshore and offshore renminbi markets (Funke, Shu, Cheng, and Eraslan 2015, Bahaj and Reis 2024).

Chinese households persistently earned artificially low or negative real returns on bank deposits, while state-owned banks used these low-cost funds to lend preferentially to state-owned enterprises (SOEs) and strategic sectors. Restricted access to foreign assets and the domestic bond market further reinforced this captive-audience structure. This system supported rapid export- and investment-led growth under weak exchange rate, but generated distorted capital allocation, underdeveloped financial markets, and repressed household consumption. Since the mid-2000s, China has gradually liberalized interest rates and expanded financial instruments, but substantial elements of financial repression — especially capital controls and state-directed credit — remain central to the policy framework. Recent academic literature that attempted to model the macroeconomics consequences of such government-controlled financial system include Dooley, Folkerts-Landau, and Garber (2004), Mendoza, Quadrini, and Ríos-Rull (2009) and Song, Storesletten, and Zilibotti (2011).

Among other emerging markets, *Brazil* has actively experimented with capital controls since

[4]More recently, the *United Kingdom* passed a rule that allows the government to force pension funds to allocate a share of their assets towards UK-based securities. By artificially absorbing British sovereign bonds, among other assets, this rule would depress domestic interest rates, acting as a tool of financial repression. According to policymakers, the goal of the policy is to promote British investment and growth.

2009, when it imposed a 2% tax on foreign capital inflows into equities and fixed-income assets, later expanding this coverage to derivatives. These controls were implemented in the wake of the global financial crisis, with the goal of tempering capital inflows and weakening appreciation pressures on the exchange rate. This policy directly raised the required return for foreign investors to enter the Brazilian market and reduced the return available to domestic consumers on foreign capital. Chamon and Garcia (2016) find that these measures successfully created a wedge between foreign and domestic interest rates, segmenting Brazilian and international capital markets and implementing financial repression. These policies also resulted in a persistent depreciation of the exchange rate.

In another example, *Turkey*, in late 2021 and early 2022, introduced a "liraization" strategy that included reserve requirements, securities-maintenance requirements, and rules which penalized banks with low shares of lira deposits. At the same time, the government backed FX-protected deposits that compensated depositors for lira depreciation. These policies steered domestic banks towards lira-based assets and reduced their incentive to intermediate foreign exchange transactions, effectively segmenting the lira and foreign funding markets. In contrast, the FX-protected deposits subsidized lira returns, rather than depressing foreign-currency returns.

Lastly, following the invasion of Ukraine in 2022 and Western financial sanctions, *Russia* has introduced a variety of capital and currency controls, including a 12% fee on purchasing foreign currency, to prevent a developing bank run and a currency crisis. The currency fee directly lowered domestic consumers' effective return on foreign-currency holdings. These measures were later relaxed once large trade surpluses driven by high energy prices relaxed the scarcity of foreign currency in the domestic market. Depreciation pressures resumed in 2023 when the government reintroduced some measure of financial repression including currency controls, namely the requirement for firms to sell foreign currency obtained from export revenues. We return to the timeline of financial repression policies in Russia and provide additional empirical evidence in Section 5 after we describe our theoretical results.[5]

3 Model

In this section, we lay out a simple model of financial repression directed at curbing private demand for foreign-currency holdings. The modeling environment follows the analysis in Itskhoki and Mukhin (2025b). We consider a small open economy that exports commodities and consumes local non-tradable and imported tradable goods. Financial markets are strongly segmented whereby only the government sector can intermediate capital flows across the border, while the household demand for FX holdings must be satisfied in the local currency market.

[5] See also Itskhoki and Ribakova (2024) for a detailed description of the timeline of sanctions and their impact on the Russian economy.

3.1 Setup

Private sector Households choose consumption of the home and import goods C_{Ht} and C_{Ft} according to

$$\max \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left[u(C_{Ht}, C_{Ft}) + v\left(\frac{B^*_{t+1}}{P^*_{t+1}}; \Psi_t \right) \right], \tag{1}$$

subject to

$$P_t C_{Ht} + \mathcal{E}_t P^*_t C_{Ft} + \frac{B_{t+1}}{R_t} + \frac{\mathcal{E}_t B^*_{t+1}}{R^*_{Ht}} \leq B_t + \mathcal{E}_t B^*_t + W_t, \tag{2}$$

where P_t and P^*_t are the prices of home and imported goods in the home and foreign currency, respectively, and W_t is the nominal wage bill for the home households. $\mathcal{E}_t$ is the nominal exchange rate, defined as the units of home currency for one unit of foreign currency; an increase in $\mathcal{E}_t$ corresponds to a home currency devaluation. (B_t, B^*_t) are quantities of home and foreign currency deposits at home-market interest rates (R_t, R^*_{Ht}).

Households are assumed to have the real value of foreign currency deposits B^*_{t+1}/P^*_{t+1} in their utility function $v(\cdot)$. This reflects their liquidity and hedging preferences, e.g., to ensure purchasing power to buy foreign tradables (imports). It also captures in a reduced-form way other precautionary motives and premia (or convenience yields) for holding foreign-currency safe assets. Ψ_t is a shock to the demand for foreign-currency balances.

We use the following functional forms:

$$u(C_H, C_F) = (1-\gamma)^{\frac{1}{\theta}} C_H^{\frac{\theta-1}{\theta}} + \gamma^{\frac{1}{\theta}} C_F^{\frac{\theta-1}{\theta}} \quad \text{and} \quad v(b; \Psi) = -\frac{\kappa}{2} \cdot (b - \Psi)^2 \tag{3}$$

where $\theta \geq 1$ is the elasticity of substitution between home and imported goods, $\gamma \in [0, 1)$ is the preference intensity for imported foreign goods, and $\kappa \geq 0$ is the preference intensity for foreign-currency (FX) balances. The FX demand shock Ψ_t is normalized such that $B^*_{t+1}/P^*_{t+1} = \Psi_t$ corresponds to the saturation point for a given value of the shock Ψ_t. This point determines the long-run desired value of private foreign currency holdings which are gradually accumulated over time, as we describe below.[6]

Government sector We combine the government, production and financial sectors into one entity. While being a useful abstraction, this approach is representative of the structure of the Russian economy, where the public sector accounts, directly and indirectly, for a major fraction of employment in both tradable and non-tradable sectors (natural resources, transportation, health-

[6] With (partial) integration of domestic households into the international financial market, the Ψ_t shocks acts as a *UIP premium* shock driving a wedge in returns between home- and foreign-currency funding in the global market (Itskhoki and Mukhin 2021). Here we focus on a segmented domestic currency market (under sanctions or capital controls) such that foreign investors cannot effectively engage in a carry trade.

care and education), as well as in finance and banking. The budget constraint of the government sector is:

$$\mathcal{E}_t\left(\frac{F^*_{t+1}}{R^*_t}-F^*_t\right)-\mathcal{E}_t\left(\frac{B^*_{t+1}}{R^*_{Ht}}-B^*_t\right)-\left(\frac{B_{t+1}}{R_t}-B_t\right)=\mathcal{E}_tQ^*_tY^*_t+P_tY_t\;-\;W_t, \tag{4}$$

where Y_t is the supply of non-tradable home goods and Y^*_t is the quantity of commodity exported at price Q^*_t in foreign currency. We denote with $TR_t\equiv\mathcal{E}_tQ^*_tY^*_t+P_tY_t$ the aggregate national income in home currency. We allow for downward price rigidity with output in non-tradable sector Y_t equal to an exogenous potential level when $P_t\geq P_{t-1}$ and otherwise determined by aggregate demand (see Schmitt-Grohé and Uribe 2016). All main results below generalize to the case of a conventional New Keynesian Phillips curve. W_t is the wage commitment and transfers to the households fixed in nominal terms in local currency.

One can also generalize (4) to include other government expenditures G_t which do not contribute to the household consumer surplus, e.g., military expenditures. The effect of higher G_t on the exchange rate is largely isomorphic to the effect of a lower non-tradable output Y_t.

Finally, F^*_t are the net foreign assets of the country and R^*_t is the world interest rate in foreign currency. The liabilities of the government sector are foreign-currency and local-currency bonds (deposits), B^*_t and B_t, which are held by the households. The set of government policy instruments includes:

1. a standard fiscal choice between borrowing B_t and adjusting expenditure W_t;
2. a conventional monetary policy tool R_t that pins down the path of domestic prices P_t;
3. accumulation (or decumulation) of government holdings of foreign reserves, $A^*_t\equiv F^*_t-B^*_t$;
4. measures of financial repression that depress households' returns on foreign currency savings R^*_{Ht}, which may deviate from the international rate of return R^*_t due to household segmentation from the international asset market (e.g., as modeled in Itskhoki and Mukhin 2023b).

Sanctions Our analysis allows for a variety of sanction shocks that may be imposed separately or combined together. Specifically, sanctions can be imposed in the goods market in the form of taxes or embargo on commodity exports $Q^*_tY^*_t$ in (4) or taxes and quantity restrictions on imports $P^*_tC_{Ft}$ in (2). We discuss the equivalence of these policies (Lerner 1936 symmetry) and circumstances when it fails in Itskhoki and Mukhin (2023a, 2025b). Financial sanctions can be imposed in the form of asset freezes on F^*_t or restrictions on international borrowing and lending that affects R^*_t, as we discuss below.

3.2 Equilibrium

The goods market clearing condition in the non-tradable sector is:

$$C_{Ht} = Y_t. \tag{5}$$

The home-currency nominal interest rate R_t allows the government to control non-tradable inflation P_{t+1}/P_t by choosing the slope of the household Euler equation, $\beta R_t \mathbb{E}_t \left\{ \frac{u_{H,t+1}}{u_{Ht}} \frac{P_t}{P_{t+1}} \right\} = 1$ with $u_{Ht} \equiv \partial u(C_{Ht}, C_{Ft})/\partial C_{Ht}$, which acts as a side equation and does not play a central role in our analysis.

The demand for imports derives from consumer expenditure optimization and can be represented as:

$$C_{Ft} = \frac{\gamma}{1-\gamma} \left(\frac{\mathcal{E}_t P_t^*}{P_t} \right)^{-\theta} C_{Ht}. \tag{6}$$

Condition (6) is our first key equation which ties the equilibrium value of the exchange rate to the relative consumption of imported and domestic goods.

The other two key equilibrium conditions for exchange rate determination are the country budget constraint and the household demand for foreign currency. First, combine the household and government budget constraints (2) and (4) expressed in foreign currency, together with the non-tradable market clearing condition (5), to derive the country budget constraint:

$$\frac{F_{t+1}^*}{R_t^*} - F_t^* = NX_t^* = Q_t^* Y_t^* - P_t^* C_{Ft}, \tag{7}$$

where NX_t^* denotes the country's net exports expressed in foreign currency terms. Note that NX_t^* is also the inflow of new foreign currency (outflow if negative), while F_t^* is the stock of foreign currency held jointly by the households (B_t^*) and the government ($A_t^* = F_t^* - B_t^*$). Note that the gap between world and home FX interest rates R_t^* and R_{Ht}^*, if it exists, does not affect the aggregate country budget constraint (7) because it only results in a transfer between households and the government sector, as captured by (4).

Finally, the household demand for foreign currency B_{t+1}^* must satisfy the following Euler equation:

$$\beta R_{Ht}^* \mathbb{E}_t \left\{ \frac{P_t^*}{P_{t+1}^*} \left[\left(\frac{C_{Ft}}{C_{Ft+1}} \right)^{\frac{1}{\theta}} + \bar{\kappa} C_{Ft}^{\frac{1}{\theta}} \left(\Psi_t - \frac{B_{t+1}^*}{P_{t+1}^*} \right) \right] \right\} = 1, \tag{8}$$

where $\bar{\kappa} \equiv \frac{\theta}{\theta-1} \frac{\kappa}{\beta \gamma^{1/\theta}} \geq 0$. While the country budget constraint (7) features the world interest rate R_t^*, household currency demand depends on their expected return of holding foreign currency R_{Ht}^*, which may be depressed relative to R_t^* in the presence of capital controls and financial repression. In addition to the conventional consumption smoothing motive for savings captured

by the first term in (8), household currency demand is also shaped by the Ψ_t shock which reflects additional precautionary savings motives as well as demand for safe assets. In particular, an increase in Ψ_t above the real value of household FX savings B^*_{t+1}/P^*_{t+1} results in a positive second term in (8), and thus compels the households to increase their holdings of foreign currency bonds despite their, possibly, low expected return R^*_{Ht} and/or at the cost of deviating from the consumption smoothing objective.

Equilibrium definition Taking endowments, international sanctions, and government policies as given, the equilibrium vector $(C_{Ft}, \mathcal{E}_t, B^*_{t+1})$ satisfies import demand (6), the country budget constraint (7), and the household demand for foreign currency (8), given non-tradable goods market clearing (5) and initial net foreign assets F^*_0. International sanctions determine the path of export revenues $Q^*_t Y^*_t$, import prices P^*_t, and the interest rate R^*_t. Government policies determine the path of nominal non-tradable prices P_t implemented by monetary policy R_t, official FX reserves $A^*_{t+1} = F^*_{t+1} - B^*_{t+1}$, and the level of financial repression $R^*_{Ht} \leq R^*_t$ of foreign-currency deposits.

From the equilibrium system (6)–(8), we observe that $\mathcal{E}_t/P_t$ — a measure of the real exchange rate — is determined independently from monetary policy (inflation), and changes in the home-good inflation shift the path of the nominal exchange rate $\mathcal{E}_t$ one-for-one with P_t. Furthermore, in the presence of $\bar{\kappa} > 0$ in (8), Ricardian equivalence does not apply for savings in foreign currency because households cannot costlessly adjust B^*_{t+1} to offset the government asset position. Hence, the choice of government reserves $A^*_{t+1} = F^*_{t+1} - B^*_{t+1}$ affects the equilibrium allocation.

Another observation is that international sanctions operate on the country budget constraint (7) and also possibly on the import demand schedule (6), while financial shocks Ψ_t and financial repression policies operates on the Euler equation (8). This implies that financial repression is a tool that can directly lean against financial shocks Ψ_t, but can only respond to international sanctions indirectly by affecting the equilibrium value of the exchange rate.

4 Optimal Financial Repression

This section discusses the role of financial repression in four steps. We start with the positive analysis and describe what allocations can be implemented with this instrument. We then show that financial repression is a suboptimal policy tool and is not required to implement the first best allocation. Moreover, even when other instruments are not available, the costs of using financial repression outweigh the benefits in the baseline model without externalities. Finally, we extend the model and show that this policy tool can be used to address important distributional effects across households, as well as shift resources between the private and the government sector.

4.1 Effects of financial repression

Before proceeding to the normative implications of financial repression, we discuss how this policy instrument affects equilibrium allocation, and in particular the equilibrium exchange rate. We also provide some supportive empirical evidence. In our context, we refer to financial repression as any policy that suppresses the foreign-currency interest rate R^*_{Ht} faced by domestic private sector (households) below the world interest rate R^*_t. Such policies include, in particular, taxes and restrictions on purchases, withdrawals and other uses of foreign currency when it is not allocated directly to paying for import transactions. These policies are only effective when domestic households are segmented from the world financial market, which is a realistic assumption in many circumstances, both in emerging markets and in some advanced economies.

To characterize the effects of financial repression, we note that R^*_{Ht} features only in the Euler equation (8) which characterizes the demand for private foreign-currency holdings B^*_{t+1}. Therefore, any path of the household's foreign-currency holdings B^*_{t+1} can be implemented with a suitable choice of the path of R^*_{Ht}. Following the primal approach, we get the following implementability result by examination of the equilibrium system:

Lemma 1 (Implementability) *Given the path of exogenous shocks, any allocation* $\{C^*_{Ft}, F^*_{t+1}\}$ *and the exchange rate* $\{\mathcal{E}_t/P_t\}$ *that satisfy the intertemporal budget constraint* (7) *and import demand* (6) *can be implemented with an appropriate choice of the financial repression policy* $\{R^*_{Ht}\}$.

Our main application of the implementability result in Lemma 1 is to study the use of financial repression to offset financial shocks Ψ_t with the goal to curb the exchange rate depreciation and the associated reduction in imports. Direct or indirect taxes on purchasing, holding or withdrawing foreign currency, captured in (8) with $R^*_{Ht} < R^*_t$, can discourage the accumulation of foreign-currency holdings B^*_{t+1} even when Ψ_t is high. In other words, financial repression ensures that foreign currency is used to buy imports C_{Ft} rather than for holding (or "hoarding") foreign cash B^*_{t+1}.[7]

Specifically, a path of R^*_{Ht}/R^*_t that declines below 1 with an increase in Ψ_t can ensure that (8) holds for the original $\{C_{Ft}, \mathcal{E}_t, B^*_{t+1}, F^*_{t+1}\}$ allocation, which remains budget feasible and satisfies (7). Therefore, such policy fully offsets the effect of the financial shock Ψ_t on the exchange rate and imports. Indeed, the increased currency demand for savings is curbed by a downward shift along the savings demand curve (8) due to depressed returns on foreign currency savings,

[7] One caveat to the result that imports can remain undistorted relies on the assumption that the financial tax is paid only by agents that purchase foreign currency as a store of value, while importers are exempt from it and can freely obtain foreign currency to pay for foreign goods. This is often the attempted policy in practice (see discussion in Schmitt-Grohé and Uribe 2024). However, if all foreign-currency purchases are subject to a tax, this reduces demand for foreign-currency both for savings and import consumption purposes, and further alleviates the exchange rate depreciation by additionally suppressing import consumption.

thereby eliminating the need for an exchange rate depreciation. While smoothing the path of imports and the exchange rate, such policy intervention results in household welfare losses from distorted foreign currency savings, as captured by $v(B^*_{t+1}/P^*_{t+1}; \Psi_t)$ in the utility (1). We summarize these results in:

Proposition 1 (Financial Repression) *Consider an increase in foreign-currency savings demand, $\Psi_t \uparrow$. There exists a financial repression tax on foreign currency holdings, resulting in $R^*_{Ht} < R^*_t$, which leaves the path of the exchange rate, imports and FX holdings unchanged. However, this results in a household welfare loss from the unaccommodated foreign-currency savings demand, $v(B^*_{t+1}/P^*_{t+1}, \Psi_t)$ in (1).*

This result establishes that financial repression can be used to offset or lean against the exchange rate depreciation pressures from sanctions, capital outflows, and general currency-demand shocks in the domestic financial market. Such policy can be useful if curbing the exchange rate depreciation is a goal in itself, however, it comes with a negative welfare consequences for households that experience the currency demand shock, as we study further below.

Empirical evidence With multiple foreign currencies and differential financial repression across currencies, the domestic-market exchange rates of these currencies should feature a wedge relative to their global exchange rate — assuming effective cross-border arbitrage is not possible under segmented markets or international sanctions.[8] To see this, examine the Euler equation for foreign currency bonds (8) which can be derived for every currency k available for purchase in the domestic market. A repressed R^{k*}_{Ht} for currency k results in a more depreciated exchange rate $\mathcal{E}^k_t$ in the domestic market relative to a currency k' with a less repressed rate of return. The repressed currencies are expected to appreciate over time to compensate for this return differential.

This insight offers a useful way to test the theory using data from Russia, where the Central Bank introduced non-uniform taxes on transactions with different foreign currencies. Specifically, on March 4, 2022 a 12% tax was introduced on purchases of US dollars, euros, and British pounds, but not other currencies. This tax was later eliminated on April 11, 2022. For concreteness, we compare the behavior of the US dollar exchange rate with that of Swiss franc, which was not subject to the tax yet was presumably as safe and, therefore, offered a close substitute to the dollar. In the left panel of Figure 1, we plot the US dollar exchange rate against the Swiss franc at the Moscow Exchange relative to its international value. The gap between the home-market and world-market dollar-franc exchange rates was identically zero before the war, but started to comove closely with the tax during the period when financial repression was imposed on the

[8] If cross-border trades were possible, this would result in an arbitrage opportunity through a short position in currency under repression and a long position in currency without repression, then taking the reverse position in the offshore market.

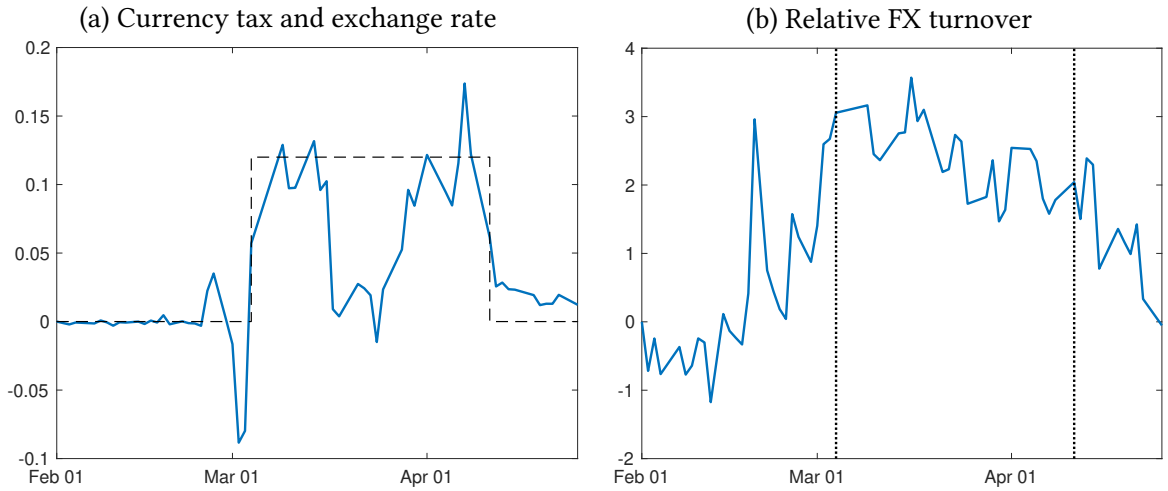

Figure 1: Swiss franc vs US dollar: currency tax, exchange rates and FX turnover

Note: Panel (a) plots the tax on purchasing dollars as dashed line and the (log) dollar exchange rate against the Swiss franc at the Moscow Exchange relative to its international value. Panel (b) shows the (log) turnover of the Swiss franc relative to the dollar turnover at the Moscow Exchange, with the value on February 1, 2022 normalized to zero.

dollar. Specifically, the Swiss franc appreciated sharply on the Moscow Exchange (and not internationally) after the 12% tax was imposed on the dollar on March 4, and then depreciated back after the tax was eliminated on April 11, resulting in the convergence of the Moscow exchange rate to the international value. The right panel of Figure 1 additionally shows that the turnover of Swiss francs on the Moscow Exchange increased dramatically relative to that of the dollar during the same period.

4.2 Optimal policies

We now characterize the optimal government policy response to shocks, first when official FX reserves are unconstrained, and second when FX interventions are limited or ruled out altogether.

First-best policy Suppose that the economy is hit with sanctions shock. How should the government respond given the policy tools at its disposal? While some shocks necessarily have negative welfare implications and cannot be offset by monetary of fiscal policy, the government can still implement the first-best allocation taking the exogenous shocks as given. This corresponds to the allocation of a social planner who is free to choose any consumption and savings plan subject to the resource constraints. In other words, the government can perfectly offset domestic nominal and financial frictions, and as the next proposition shows, each policy instrument plays its own role and cannot be substituted by the other one (proof is standard, see e.g. Itskhoki and Mukhin 2023b)

Proposition 2 (First Best) *The optimal government response to trade and financial sanctions can implement the first-best allocation and requires:*

1. *monetary policy R_t that relaxes nominal rigidities via price targeting, $P_t = P_{-1}$;*
2. *FX interventions that offset foreign-currency demand shocks Ψ_t with the sales of official FX reserves, $A^*_{t+1} = F^*_{t+1} - B^*_{t+1}$, such that $B^*_{t+1}/P^*_{t+1} = \Psi_t$;*
3. *no financial repression, $R^*_{Ht} = R^*_t$.*

Furthermore, fiscal policy and the path of the local-currency debt B_{t+1} is irrelevant due to Ricardian equivalence for local-currency assets and liabilities.

As usual, monetary policy is used to address nominal rigidities. Because there is only one sticky price, inflation targeting ensures that prices do not need to adjust at any point in time and this eliminates the output gap — a standard divine coincidence result (Galí and Monacelli 2005). This policy is optimal in a large class of New Keynesian Open-Economy models even when divine coincidence does not hold (Egorov and Mukhin 2023). At the same time, conventional fiscal policy is irrelevant and not uniquely pinned down because of the Ricardian equivalence: a change in B_{t+1} leaves the permanent income of households and their consumption decisions unchanged, as they expect an offsetting adjustment in future income commitments $\{W_{t+j}\}$ which keeps the intertemporal budget constraint unchanged.

In contrast to conventional open-economy models, however, increased household demand for foreign currency Ψ_t should be accommodated with FX interventions by the government to smooth fluctuations in the exchange rate $\mathcal{E}_t$ and imports C_{Ft}. This is due to the segmentation of the international financial market and the resulting failure of Ricardian equivalence for the foreign-currency asset holdings. In particular, the government needs to supply foreign currency in the domestic financial market by selling official reserves to accommodate the increased household FX demand. That is, the provision of official reserves A^*_{t+1} to accommodate a desired increase in B^*_{t+1}, such that $B^*_{t+1}/P^*_{t+1} = \Psi_t$ at all times, allows to satisfy the foreign-currency demand of households without altering the path of the country's net foreign assets $F^*_{t+1} = A^*_{t+1} + B^*_{t+1}$.[9] This ensures that both (8) and (7) are satisfied for the original path of C_{Ft} and $\mathcal{E}_t$ despite the increase in Ψ_t. From the normative perspective, such policy is optimal, at least when the origin of Ψ_t is a "liquidity demand shock" for foreign currency and is not triggered by productivity and other fundamental macroeconomic shocks that require accommodation with trade imbalances (see Itskhoki and Mukhin 2023b).

Conditional on monetary policy eliminating nominal rigidities and FX interventions offsetting FX demand shocks in a segmented currency market, there is no need left for financial repression.

[9]Note that import sanctions that elevate P^*_{t+1} also require a similar FXI accommodation as they increase the demand for nominal FX balances given our utility specification in (1).

Although financial repression can be used to lean against the currency demand shocks, this instrument introduces a distortion — that is, a deviation from the *Friedman rule* — as pointed out in Proposition 1, and it is welfare dominated by FX interventions. Indeed, note that FX is perfectly-elastically supplied in the international market at the rate R_t^*, but it can only be made available to the domestic households that are segmented from the international market via government FX interventions, in cases when they are feasible.

Second-best policy Proposition 2 establishes a useful benchmark which, however, may not always be attainable in practice in view of limited official FX reserves. This is particularly the case under international sanctions on the central bank's foreign asset holdings. Before characterizing second-best policies, we ask whether the government can create synthetic safe assets with economic properties that are identical to foreign currency.

To answer this question, we rewrite the government budget constraint (4) in foreign currency terms as:

$$\frac{F_{t+1}^*}{R_t^*} - F_t^* = Q_t^* Y_t^* + \frac{Y_t - W_t/P_t}{\mathcal{E}_t/P_t} + \left(\frac{B_{t+1}^*}{R_{Ht}^*} - B_t^*\right) + \frac{1}{\mathcal{E}_t}\left(\frac{B_{t+1}}{R_t} - B_t\right).$$

It follows that the increased demand for B_{t+1}^* can be satisfied in two ways. One solution is to back foreign currency liabilities B_{t+1}^* with additional foreign assets F_{t+1}^*. In normal times, this allows the government to balance the currency risk in the banking system. However, financial sanctions and the prospect of future foreign asset freezes may render such accommodation infeasible.

Alternatively, the government can create synthetic foreign-currency deposits B_{t+1}^* that are not backed by foreign assets (e.g., even when $F_{t+1}^* \equiv 0$). Instead, these liabilities can be financed with future consolidated revenues ($Q_t^* Y_t^* + Y_t/\mathcal{E}_t$) or local-currency assets ($B_{t+1} < 0$). However, the resulting currency mismatch means that the value of liabilities (B_{t+1}^*) increases relative to the value of assets ($-B_t/\mathcal{E}_t$) when the national currency depreciates ($\mathcal{E}_t \uparrow$), e.g., in response to a financial shock Ψ_t. The government then faces a trade-off between its commitment to the workers W_t/P_t and to savers B_t^* with monetary inflation ($P_t \uparrow$) used to redistribute resources from the former to the latter to ensure repayment.[10] Therefore, the ability of the government to create synthetic FX deposits unbacked by official FX reserves is limited in practice.

Is it then optimal for the government to use some degree of financial repression when FX reserves are limited? Perhaps, surprisingly from the perspective of the second-best logic, the answer to this question is an unqualified "no".

[10] Such redistribution is further complicated by the fact that higher inflation amplifies demand for foreign-currency deposits. Moreover, large unbacked FX liabilities can undermine the credibility of the government leading to a bank run with large FX deposit withdrawals, a mechanism reminiscent of Krugman (1979)'s balance-of-payments crisis.

Proposition 3 (Second Best) *In the absence of official FX reserves, $F_t^* = B_t^*$, the use of any amount of financial repression, $R_{Ht}^* < R_t^*$, to offset the foreign currency demand shock, $\Psi_t \uparrow$, necessarily reduces welfare in a representative-agent economy relative to laissez-faire.*

Why is zero amount of financial repression optimal in this case despite the sub-optimality of the resulting allocation? In particular, why the extra currency depreciation resulting from a Ψ_t shock unaccommodated by FX interventions (Propositions 2) shall not be corrected with some amount of financial repression (Proposition 1)?

To provide intuition for our answer contained in Proposition 3, we note that an unaccommodated currency demand shock Ψ_t generates a trade-off between sustaining the original level of imports C_{Ft} and accumulating foreign currency to satisfy FX savings demand B_{t+1}^*. In a representative agent economy, there is no externality in this trade-off, and the household allocates efficiently the scarce supply of foreign currency from exports between import purchases and savings (FX accumulation). Put differently, the equilibrium exchange rate reflects the opportunity costs associated with this trade-off so that individual agents can fully internalize the *pecuniary* externality that emerges from their choices. Absent spare official FX reserves, there is no room for a welfare-improving government intervention in the currency market.

We note that matter may be different if exchange rate dynamics (in levels or changes) are associated with additional external effects beyond the consumption-savings trade-off emphasized in our baseline model. For example, this can be the case in the presence of private foreign-currency debt overhang with inefficient default. We discuss this case in Section 4.5.

4.3 Heterogenous agents and redistribution

We have established that the use of financial repression to curb private FX demand is welfare-reducing in a representative-agent economy. Nevertheless, we show next that financial repression may be an important policy instrument for the purposes of redistribution in economies with heterogeneous agents. In such economies, the exchange rate plays an important allocative role even under financial autarky and financial repression. We illustrate these points in an extension of our model that features two types of households — unconstrained Ricardian agents and constrained hand-to-mouth households.

Consider hand-to-mouth agents who work in the domestic non-tradable sector and receive a fixed share α of non-tradable revenues, $\alpha P_t Y_t$, as wages. These agents split their income to consume home and imported goods, maximizing $u(C_{Ht}, C_{Ft})$, but do not hold any savings and, in particular, do not have foreign currency deposits. The rest of the income in the economy, $(1-\alpha)P_t Y_t + \mathcal{E}_t Q_t^* Y_t^*$, is received by the unconstrained Ricardian agents who have access to savings, and in particular can hold foreign-currency deposits B_{t+1}^*, but are still segmented from

the international financial market. These agents are also subject to the foreign-currency savings demand shock Ψ_t as described in (1). Note that when $\alpha = 0$, this economy is equivalent to the baseline economy with Ricardian households only.

Under Cobb-Douglas preferences, with $\theta = 1$ in (3), the aggregate equilibrium quantities in the heterogeneous-agent economy are the same as in a representative-agent economy, and are independent of the domestic income share α earned by the hand-to-mouth households.[11] In particular, sanctions that reduce export revenues $Q_t^* Y_t^*$ have no direct effect on income of the constrained households but lead to a depreciation of the exchange rate, $\mathcal{E}_t \uparrow$, which raises import prices $\mathcal{E}_t P_t^*$ and reduces their welfare. The same logic applies for sanctions on international savings (reducing R_t^*) or foreign asset freezes (on F_t^*) which also depreciate the exchange rate by tightening the inter-temporal budget constraint of the country (7), as we characterize in Itskhoki and Mukhin (2025b).

The extension of the model with heterogenous households shows the robustness of the existing results on the impact of international sanctions and sheds new light on their distributional consequences, as well as on the distributional effects of financial repression that is used to counter the exchange rate response to sanctions. We prove in Appendix A the following result:

Proposition 4 (Redistribution) *Assume $\theta = 1$. Then the aggregate dynamics of the economy do not depend on the share α of non-tradable income received by the hand-to-mouth households. In the absence of official FX reserves, $F_t^* = B_t^*$, the use of financial repression, $R_{Ht}^* < R_t^*$, to offset the foreign-currency demand shock, $\Psi_t \uparrow$, increases utilitarian welfare by redistributing from Ricardian to hand-to-mouth agents, provided the fraction of Ricardian households is sufficiently small.*

The intuition behind this result is that financial repression, $R_{Ht}^* < R_t^*$, in a heterogeneous-agent economy limits foreign-currency savings by the unconstrained Ricardian agents and leaves a greater portion of foreign currency supply in the economy to be allocated to the purchases of imports. Formally, recall from Proposition 1 that financial repression leans against the effect of the currency demand shock Ψ_t on the exchange rate, offsetting (part of) the depreciation. This makes a greater quantity of imports affordable to the constrained hand-to-mouth agents given that their incomes are in home currency terms, $C_{Ft}^C = \gamma \frac{\alpha P_t Y_t}{\mathcal{E}_t P_t^*}$. The unconstrained Ricardian agents also increase their consumption of imports, but less than proportionally because part of their revenues are from exports, $C_{Ft}^R = \gamma \frac{(1-\alpha) P_t Y_t + \mathcal{E}_t Q_t^* Y_t^*}{\mathcal{E}_t P_t^*}$. The unconstrained agents additionally lose from financial repression which curbs their foreign-currency savings. Therefore, such a policy redistributes welfare away from the unconstrained (and presumably richer) agents towards the constrained (and presumably poorer) hand-to-mouth agents, limiting their welfare

[11] This result extends the logic from Werning (2015) and Auclert, Rognlie, Souchier, and Straub (2021) to an open economy with a rich set of shocks.

losses from sanctions.[12] In other words, the same pecuniary exchange-rate externality as before has distributional consequences under household heterogeneity, and thus can rationalize the use of financial repression as a tool of redistribution.

4.4 Fiscal revenues and inflation

Perhaps the most common use of financial repression in practice concerns public finances (Reis 2025). We now study the fiscal implications of financial repression focusing on its redistributive potential between the households and the government in a representative agent economy. Even if less commonly used in normal times, such policies may emerge as a natural response in economies under financial sanctions and strained by capital outflows and foreign-currency demand shocks.

Long-run seignorage We consider a long-run equilibrium environment. Given endowments and sanctions, the long-run equilibrium is characterized by the interaction of the country budget constraint (7) and its import demand schedule (6). The steady state versions of these conditions can be written as:

$$\bar{C}_F = \frac{(1-\beta)\bar{F}^* + \bar{Q}^*\bar{Y}^*}{\bar{P}^*} \qquad \text{and} \qquad \frac{\mathcal{E}}{P} = \bar{P}^* \left(\frac{\gamma}{1-\gamma} \frac{\bar{Y}}{\bar{C}_F} \right)^{1/\theta}, \tag{9}$$

where in steady state $\bar{R} = \bar{R}^* = 1/\beta$ and international financial sanctions are captured with a reduction in $\bar{F}^*$. Note that import sanctions that increase $\bar{P}^*$ or export and financial sanctions that reduce $(1-\beta)\bar{F}^* + \bar{Q}^*\bar{Y}^*$ have an identical effect on the allocation reducing import consumption $\bar{C}_F$, but a differential effect on the exchange rate $\mathcal{E}/P$ (see Lorenzoni and Werning 2022, Itskhoki and Mukhin 2025b). The government under sanctions can choose inflation P and the nominal exchange rate $\mathcal{E}$, but not the value of the long-run real exchange rate $\mathcal{E}/P$, even when financial repression tool is available. We return to this discussion below when we study transition dynamics.

What can financial repression achieve in a steady state? We still have the optimal household foreign-currency holdings demand condition (8), which does not affect steady-state imports $\bar{C}_F$, but determines foreign-currency balances B^* of the households as a function of $R_H^* \leq 1/\beta$. We write the steady-state version of this condition as follows:

$$\beta R_H^* \left[1 + \bar{\kappa} \bar{C}_F^{\frac{1}{\theta}} \left(\bar{\Psi} - \frac{B^*}{\bar{P}^*} \right) \right] = 1, \tag{10}$$

[12] A related case for FX interventions is examined by Fanelli and Straub (2021). Similar motivation may arise when the exchange is directly in the objective of the policymaker.

which determines the steady-state FX demand schedule $B^*(R_H^*)$ given the demand shifter $\bar{\Psi}$ and steady-state value of import quantities $\bar{C}_F$ and import prices $\bar{P}^*$. Given this demand schedule, the government can act as a monopolist that supplies foreign currency deposits to the households and extract the maximum amount of surplus (seignorage) from the households.

To characterize the optimal seignorage, we rewrite the government budget constraint (4) in steady state as follows:

$$\left[\bar{Q}^*\bar{Y}^* + \frac{\bar{Y} - W/P - (1-\beta)B/P}{\mathcal{E}/P}\right] + (1-\beta)\bar{F}^* - \left(1 - \frac{1}{R_H^*}\right) B^* = 0. \tag{11}$$

The first term in the square parenthesis collects the primary surplus of the government budget and the interest rate service costs of the domestic-currency government debt. The last two terms reflect the surplus that the government can extract by supplying foreign-currency balances to the households.

The financial repression that maximizes seigniorage revenues solves

$$\min_{R_H^*} \left(1 - \frac{1}{R_H^*}\right) B^*(R_H^*) \propto \left(1 - \frac{1}{R_H^*}\right)\left(1 - \frac{1}{\beta R_H^*} + \bar{\kappa}\bar{C}_F^{1/\theta}\bar{\Psi}\right),$$

where we substituted in the $B^*(R_H^*)$ schedule implied by (10). This results in the following seigniorage-maximizing level of financial repression:

$$R_H^* = \frac{2}{1 + \beta + \beta\bar{\kappa}\bar{C}_F^{1/\theta}\bar{\Psi}} < \frac{1}{\beta},$$

assuming that $\bar{\Psi} > 0$. Note that R_H^* is decreasing in $\bar{\Psi}$ as a higher foreign-currency demand shock allows the government to collect higher seignorage revenues by lowering the return on foreign-currency deposits. Of course, this is a distortionary tax (transfer) as the welfare-maximizing allocation follows the Friedman rule (Proposition 2) with $B^* = \bar{F}^* = \bar{P}^*\bar{\Psi}$ and $R_H^* = 1/\beta$ setting the last two terms in the government budget constraint (11) to zero.

Proposition 5 (Seignorage) *In a steady state under international sanctions, the seignorage-maximizing financial repression features $R_H^* < R^* = 1/\beta$ with this gap and the amount of seigniorage increasing in the foreign-currency demand shock $\bar{\Psi}$.*

Financial sanctions that increase segmentation of households from the international financial market and increase private demand for foreign-currency deposits may have an unindented consequences of increasing the scope (monopoly rents) for the government seignorage revenues from supplying FX in the domestic currency market. These revenues, however, come as a result of distorting the domestic currency market and should be weighed against other forms of distortionary taxes (Caravello and Werning 2024).

Short-run dynamics The analysis of the long run suggests that the government has no control over the level of the real exchange rate which is determined at the intersection of the intertemporal budget constraint and the import demand schedule given by (9). The government can choose only the rate of nominal devaluation equal to the rate of monetary inflation. It can also use the repression of household foreign-currency demand by limiting the supply of FX reserves to the domestic currency market and collect the associated seigniorage revenues.

These insights are still true on average along the entire transition path, however, the government can additionally manipulate the transitory dynamics of the real exchange rate around this long-run average level, and therefore affect the path of domestic inflation and fiscal revenues with this unconventional tool. We write the approximate expressions for nominal fiscal revenues and the consumer price inflation as follows (see formal derivation in Itskhoki and Mukhin 2025b):

$$\mathrm{d}\log TR_t = p_t + y_t + \chi\big[(e_t - p_t) + (q_t^* + y_t^* - y_t)\big], \tag{12}$$

$$\mathrm{d}\log CPI_t = p_t + \gamma\big[(e_t - p_t) + p_t^*\big], \tag{13}$$

where small letters denote log deviations for the corresponding variables, χ is the steady-state share of government revenues from exports in total government revenues, and γ is the consumer expenditure share on imports.

First, we note that both monetary inflation p_t and the real exchange rate $e_t - p_t$ show up in both expressions. Monetary policy controls the former, while FX interventions and financial repression has the capacity to shift the dynamic path of the latter (recall Proposition 1). Indeed, financial repression that leans against the exchange rate depreciation caused by export and financial sanctions can limit the pressure on consumer prices, however, it reduces fiscal revenues expressed in local currency, resulting in a trade-off for the government. Furthermore, such policies are necessarily temporary, as over time the pressure from the inter-temporal budget constraint will reverse the sign of the short-run real exchange rate movement.[13] Therefore, the government can choose to either tighten financial repression or loosen it in the short-run depending on whether the inflation or fiscal revenues concerns are more pressing in the moment.

Proposition 6 (Timing of fiscal revenues) *Relaxing financial repression of the local currency market, $R_{Ht}^*/R_t^* \uparrow$, depreciates the real exchange rate and boosts the government fiscal revenues in local currency in the short run at the cost of greater consumer price inflation; and vice versa. This policy has no first-order effect on the present discounted sum of fiscal revenues.*

[13] First-order approximation to the country budget constraint implies that $f_0^* + \sum_{t=0}^{\infty} \beta^t (q_t^* + y_t^* - p_t^* - c_{Ft}) = 0$, while the import demand schedule is $c_{Ft} = y_t - \theta(p_t^* + e_t - p_t)$. Combined together, these conditions pin down the average value of the real exchange rate, $\sum_{t=0}^{\infty} \beta^t \theta (e_t - p_t) = -f_0^* - \sum_{t=0}^{\infty} \beta^t (q_t^* + y_t^* + (\theta - 1) p_t^* - y_t)$. Note that this excludes the possibility of the government burning, or withholding indefinitely, resources from the combined intertemporal country budget constraint; in contrast, changing the present value of resources available for consumption has a permanent level effect on the exchange rate.

Leaving aside seigniorage, the present discounted value of government revenues is exogenous to FX interventions and financial repression of the currency market, and it cannot be changed by manipulating the dynamic path of the real exchange rate. Financial repression can be combined with FX interventions to extract financial surplus more effectively, as we discuss in Itskhoki and Mukhin (2023b). We leave for future research the Ramsey problem of financing an exogenous government expenditure target while creating the minimum distortion for households when the two policy instruments are available (e.g., as in Chari, Nicolini, and Teles 2023).

4.5 Currency crisis and debt overhang

We conclude this section with a brief discussion of the ability of financial repression to limit the foreign-currency deposit run and the debt overhang that constrain the production capacity of the economy. This is particularly relevant for the economies with a significant dollarization of domestic borrowing and lending. Indeed, financial repression of the domestic currency market can lean against the depreciation pressures, at least temporarily, and thus limit the foreign-currency deposit run and the debt overhang constraint in the domestic economy (see e.g. Bianchi 2011, Eggertsson and Krugman 2012).

For example, consider an economy where domestic output depends negatively on the gross real debt: $Y_t = Y\left(\frac{D_t+\mathcal{E}_t D_t^*}{P_t}\right)$ with $Y'(\cdot) < 0$, where D_t and D_t^* are gross amounts of debt denominated in local and foreign currency respectively. It follows that sanctions that depreciate the real exchange rate, $\mathcal{E}_t/P_t \uparrow$, are more damaging as they increase debt burden and lower output (Itskhoki and Mukhin 2023a). This effect is stronger in economies with a more dollarized credit market, when D_t^* is large relative to D_t. The economy now features a *non-pecuniary* production externality that is linked to the value of the exchange rate with a depreciation resulting in a lower productivity in the economy in the presence of foreign-currency debt.

Under these circumstances, government interventions that redistribute wealth from savers to borrowers can mitigate the negative effect of export sanctions on local output when it is constrained by the debt overhang. This includes partially inflating away or defaulting all gross debt positions, a temporary freeze of debt repayment (e.g., a bank holiday), and direct government bailouts. In addition, FX interventions, capital controls, and financial repression of the domestic currency market can also play a role by curbing the short-run depreciation of the currency. We leave to future research whether and when such policies can stave off a bank-run equilibrium altogether, as well as the optimal mix of such policies in a production economy with financing frictions.

5 Quantitative History of Financial Repression in Russia

This section describes the quantitative model of sanctions and policy response in Russia in the aftermath of the invasion of Ukraine in February 2022. We use this model to describe the various policy regimes between February 2022 and September 2024 in response to the sanctions and other financial shocks with a particular focus on the dynamics of the exchange rate and the timeline of financial repression policies used.

Quantification We use the linearized version of the model from Section 3, and solve it using a first-order perturbation around a non-stochastic steady state under perfect foresight (for details, see Itskhoki and Mukhin 2025b). We calibrate the model parameters and shocks with the aim of matching salient features of the Russian economy which is large in the global commodity market, but small in the global financial market. We infer structural shocks from the observed macroeconomic dynamics and, by construction, reproduce the path of observables including the exchange rate.

In particular, we capture the fact that about half (or $300 billion) of Russian foreign assets were frozen in the first week of the invasion which corresponds to a permanent decrease in F_0^* by 12 months worth of imports. We match the path of official FX reserves A_t^* that are reported by the Bank of Russia. Monetary shocks are inverted from the path of consumer prices P_t, and domestic output Y_t is proxied with the path of the real GDP. The Russian commodity output Y_t^* is the difference between observable export revenues and commodity prices Q_t^*. Russian import prices P_t^* are inferred using the import demand schedule to match the path of import expenditure.

The war and sanctions were associated with a sharp increase in uncertainty, demand for FX safe assets, and in capital outflows. These was partly addressed with FX interventions and with financial repression of the currency market. The former are inferred from the Bank of Russia data on official FX reserves. Finally, we recover the currency demand shock Ψ_t as a residual, upon including all other shocks, that allows to perfectly fit the observed path of the exchange rate. We interpret the resulting Ψ_t series as the net FX demand shocks partially offset by financial repression. We verify that the resulting path of Ψ_t tracks closely the dynamics of capital flows out of Russia captured by the collapse in external liabilities: in particular, there is a spike in capital outflows after the start of the war which slowly reverts over the next year.

The exchange rate This quantification allows us to decompose the dynamics of the exchange rate into contributions of various shocks and policies. Figure 2 plots the results with the black line corresponding to the observed paths of the exchange rate and the colored bars showing the contributions of various shocks to these overall dynamics. The role of shocks changes significantly over time. In particular, we find that capital outflows driven by the financial shock Ψ_t

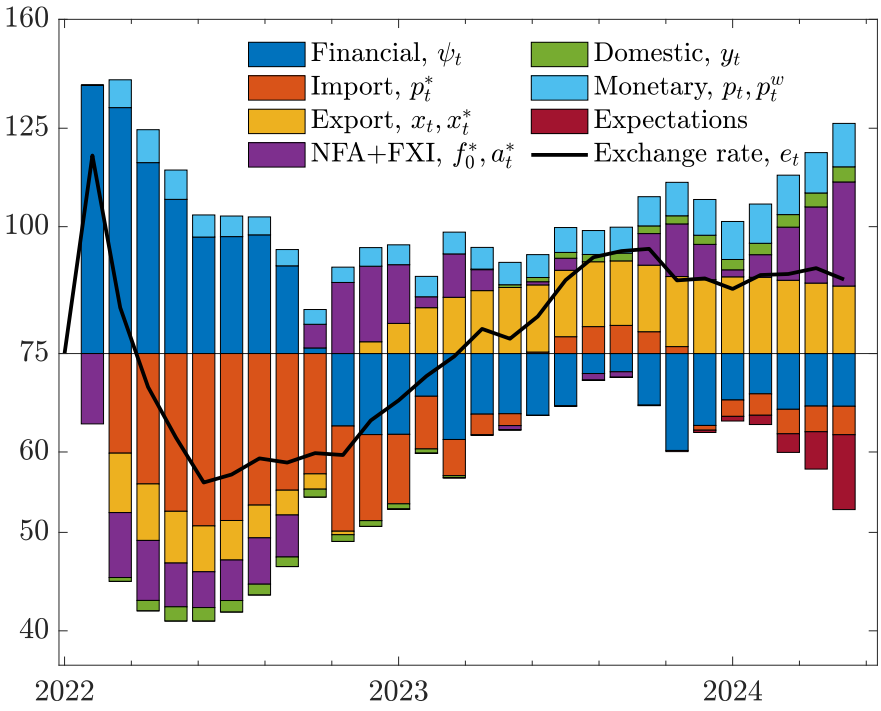

Figure 2: Exchange rate dynamics: contribution of shocks and policies

Note: The figure shows with solid black line the observed path of the ruble exchange rate against the US dollar which matched exactly by the quantified model; the colored bars display the contributions of invidual shocks and policies according to the model. Source: Itskhoki and Mukhin (2025b).

were the key driver behind the sharp 50% depreciation of the ruble in the first weeks of the war, and the depreciation of the exchange rate would have been 20% larger if the central bank did not sell foreign reserves to satisfy the increased demand for foreign currency. In contrast, despite the large amount of FX reserves frozen by sanctions, the impact of this freeze on the value of the exchange rate was small (albeit very persistent) generating a permanent 3% depreciation.[14] Nonetheless, the FX freeze and sanctions on the Central Bank likely constrained its ability to fully accommodate the financial shock with unrestricted FX interventions, which would have been a part of the unconstrained optimal policy response (Proposition 2).

One month out, trade shocks begin to dominate the dynamics of the exchange rate. First, trade restrictions that result in higher effective import prices P_t^* and the resulting decline in import quantities curb demand for foreign currency and act as a major ruble appreciation force in summer 2022. Second, the increase in energy prices Q_t^* and hence Russian export revenues in the first months after the invasion increase supply of foreign currency and also contribute to the appreciation of the currency. Finally, a small contraction in domestic consumption also reduces import demand and contributes to the strengthening of the ruble. All in all, the combined effect

[14]Indeed, a permanent income loss from an asset freeze worth 100% of annual exports corresponds to a permanent reduction of export flows of about 4%, i.e., the annual rate of interest.

neutralizes the surge in financial demand for foreign currency and explains the appreciation of the ruble from the third month onward.

Over time, import prices mean revert and import quantities recover as parallel imports and new trade linkages are established, resulting in a rebound in foreign-currency demand and an exchange rate depreciation. At the same time, the inflow of foreign currency contracts as commodity export revenues decline. Combined together, these forces bring the exchange rate back to the pre-war level about one year after the start of the war with a continued gradual depreciation thereafter. This depreciation trend is amplified by the government policy to rebuild FX reserves starting in the end of 2022. The eventual decline in export revenues dominates over time, and the ruble ultimately depreciates by around 20% relative to its pre-war level. Finally, note the contribution of monetary accommodation (inflation) which results in additional nominal depreciation, albeit small, but increasing towards the second half of 2024.

Timeline of financial repression Itskhoki and Ribakova (2024) provide a timeline of Western sanctions imposed on Russia, both before 2022 and after the start of the war in February 2022. We complement this timeline with the account of the Russian policy responses.

A central open question is why the barrage of financial and trade sanctions was short of inflicting a full-scale financial and currency crisis in the Russian economy after making a significant dent in the early days of the war. One hypothesis is that sanctions were insufficient and the particular sanctions mix imposed on the Russian economy was suboptimal. The alternative hypothesis is that the state of the Russian economy — which entered the war with significant fiscal and trade surpluses, large and diversified FX reserves, little dollarization of the domestic financial market, and extensive controls over the financial system (altogether referred to as "Economic Fortress Russia") — combined with the immediate policy response to sanctions managed to stave off the financial crisis sufficiently until export revenues kicked in and stabilized the economy. Under this alternative hypothesis, there did not exist a combination of sanctions that could have tipped Russian economy into a full-scale financial crisis absent a significant policy blunder.

Western financial sanctions were imposed almost instantly upon the Russian invasion of Ukraine on February 22, 2022. This triggered a sharp sudden stop and a capital outflow from Russia, as well as a bank run on ruble deposits inside the country. The Russian Central Bank responded with a battery of policies to avoid the bank run and the currency crisis, including strict capital controls and a hike in the interest rate from 9.5% to 20% overnight, on February 28, as well as an export-revenue FX-repatriation requirement. A freeze on withdrawals of currency deposits was implemented soon after, in early March, and a 12% tax on purchases of foreign currency were added on March 4 (see Figure 1 in Section 4). These measures of financial repression were directed at households attempting to liquidate their ruble deposits and convert their savings into dollars and euros. This coincided with a sell-off of Russian assets by foreign companies and investors and

an attempt to convert and expatriate the proceeds. Additional measures of capital controls and financial repression were directed to limit such capital outflows. This early period corresponds to the time of the sharp depreciation of the ruble and the subsequent reversal towards a sharp appreciation in Figure 2.

The large trade surplus in the spring and summer of 2022 driven by high world energy prices and steady demand for Russian commodities has largely replenished the foreign currency supply from frozen official reserves. The inflow of foreign exchange from trade surpluses into the domestic currency market alleviated pressures on the ruble exchange rate and eliminated the scarcity of the hard currency. As a result, the ruble appreciated by 20% above the pre-war level. The Central Bank rolled back most measures of financial repression by mid-May 2022 and gradually reduced the policy rate by June 2022, as the strong ruble became a major factor contributing to the mounting fiscal deficit. This roll-back contained the appreciation of the ruble despite the persistent trade surpluses, which jointly alleviated the fiscal pressures in the summer of 2022 during a period of relaxed financial repression (*cf.* Proposition 6). Furthermore, the government started rebuilding official FX reserves from large trade surpluses in the fall of 2022. Capital controls and restrictions on cross-border capital outflows remained in place throughout this period. This period corresponds to the portion of Figure 2 with the value of the ruble appreciated above the pre-war level (namely, less than 75 rubles per dollar).

The reversion in import expenditure to pre-war levels by late 2022 and the erosion of export revenues that started in the last months of 2022 — driven by declining world energy prices, the European energy embargo, and the export price cap[15] — contributed jointly to a steep depreciation of the ruble from the fall of 2022 and through the end of summer 2023, during which period the ruble lost half its value. Late 2023 is also the beginning of considerable aggregate-demand-driven inflation, when monetary policy could no longer contain fiscal pressures from increasing military expenditure that reached nearly 10% of GDP. The policy rate was increased multiple times during late 2023 and throughout 2024 until it reached the level of 21%.

By September 2023, the ruble had reached a psychological barrier of 100 rubles per dollar. This marked the beginning of the second wave of financial repressions, now mostly targeted at the exporting firms. The government gradually increased the requirement to repatriate and sell foreign currency obtained from exporting until this requirement exceeded 90% of all export revenues. This allowed to first slow down the depreciation and later stabilize the value of the ruble just below the mark of 100 rubles per dollar, where it stayed throughout 2024. Russia continued running trade surpluses during this period and the capital outflows very curbed with continued measures of capital controls and financial repression of demand for foreign currency.

[15] Babina, Hilgenstock, Itskhoki, Mironov, Ribakova, and Shapoval (2025) provide a decomposition of the effect of these factors on the decline in the overall trade surplus.

6 Conclusion

Our analysis shows that while financial repression and FX interventions can both manipulate the real exchange rate by counteracting shocks to household currency demand, their welfare properties differ sharply. FX interventions expand local supply of foreign currency and thus accommodate the respective household demand, whereas financial repression suppresses demand by lowering liquidity and effective returns on foreign deposits. As a result, when standard monetary and fiscal tools are available, the optimal policy mix features inflation targeting combined with FX interventions and excludes financial repression. These two instruments suffice to implement the first-best allocation in response to both domestic disturbances and foreign geoeconomic shocks such as tariffs and sanctions. Even when FX reserves are scarce or frozen, financial repression remains unwarranted: without reserves, the exchange rate already internalizes the relevant trade-off between imports and currency demand, leaving no externality for financial repression to correct.

However, financial repression re-emerges as a potentially valuable tool when the government faces binding fiscal constraints that prevent the use of lump-sum transfers. In environments with heterogeneous agents, financial repression helps correct distributional externalities that arise because Ricardian households do not internalize the effects of their FX purchases on hand-to-mouth households. Likewise, when conventional taxation is limited, financial repression can redistribute income towards the government through two channels: by collecting seigniorage from downward-sloping currency demand, and by temporarily boosting fiscal revenues from the export sector via an exchange-rate depreciation induced by relaxed constraints on private purchases of foreign exchange. This later fiscal motive operates only intertemporally and does not alter the long-run resource constraint of the government. Thus, financial repression is neither part of the optimal stabilization toolkit nor a substitute for FX policy, but rather a narrowly targeted instrument that becomes relevant only under specific fiscal and distributional constraints, or in the presence of externalities or objectives linked directly to the equilibrium value of the exchange rate.

APPENDIX

A Model with Heterogeneous Households

We follow the recent open-economy literature with heterogenous agents (De Ferra, Mitman, and Romei 2020, Guo, Ottonello, and Perez 2020, Auclert, Rognlie, Souchier, and Straub 2021) and consider a simple extension of the baseline model that allows us to disentangle the role of exchange rates in goods and asset markets. In particular, assume two types of agents – the hand-to-mouth (constrained) households and (unconstrained) households with access to asset markets. The former agents work mostly in the non-tradable sector and receive a constant fraction of home output $\alpha P_t Y_t$. These households make no savings or borrowing, enjoy no utility from holding assets, and are subject to the budget constraint

$$P_t C_{Ht}^C + \mathcal{E}_t P_t^* C_{Ft}^C = \alpha P_t Y_t.$$

In contrast, the unconstrained agents can borrow and save and receive the rest of national income:

$$P_t C_{Ht}^R + \mathcal{E}_t P_t^* C_{Ft}^R + \frac{\mathcal{E}_t B_{t+1}^*}{R_t^*} = \mathcal{E}_t B_t^* + (1-\alpha) P_t Y_t + \mathcal{E}_t Q_t^* Y_t^*.$$

The Euler equation (8) still holds, but only for the unconstrained agents.

The Cobb-Douglas preferences $\theta = 1$ imply that constrained households spend a constant fraction of their income on home and foreign goods:

$$C_{Ht}^C = (1-\gamma)\frac{\alpha P_t Y_t}{P_t} = (1-\gamma)\alpha Y_t, \qquad C_{Ft}^C = \gamma\alpha \frac{P_t Y_t}{\mathcal{E}_t P_t^*}.$$

Given the market clearing condition for local goods

$$C_{Ht}^C + C_{Ht}^R = Y_t,$$

consumption of non-tradables by unconstrained agents is equal

$$C_{Ht}^R = \big[1 - (1-\gamma)\alpha\big] Y_t.$$

Combine this expression with the optimality condition for unconstrained households

$$\frac{C_{Ft}^R}{C_{Ht}^R} = \frac{\gamma}{1-\gamma}\frac{P_t}{\mathcal{E}_t P_t^*},$$

to solve for their demand for foreign goods:

$$C_{Ft}^R = \frac{\gamma}{1-\gamma}\big[1-(1-\gamma)\alpha\big]\frac{P_t Y_t}{\mathcal{E}_t P_t^*}.$$

It follows that $C_{Ft} = C_{Ft}^C + C_{Ft}^R = \gamma \frac{P_t Y_t}{\mathcal{E}_t P_t^*}$ and the unconstrained households account for a fixed fraction of total imports

$$C_{Ft}^R = \left[\frac{1}{1-\gamma} - \alpha\right] C_{Ft}.$$

Substitute this expression into the Euler equation (8) for unconstrained households to rewrite it in terms of the aggregate variables. The equilibrium system for $C_{Ft}, \mathcal{E}_t, B_{t+1}^*$ is then isomorphic to the Euler equation, country's budget constraint, and optimal demand (6) in the baseline model and does not depend on α (up to a renormalization of parameter κ).

To prove the second part of the proposition, consider the problem of the planner with the Pareto weight ω on constrained agents, which corresponds to their share in population in the utilitarian case:

$$\begin{aligned}
\max \quad & \mathbb{E}\sum_{t=0}^{\infty}\beta^t\left\{\omega\log C_{Ft}^C + (1-\omega)\left[\log C_{Ft}^R - \frac{\kappa}{2}\left(\frac{B_{t+1}^*}{P_{t+1}^*} - \Psi_t\right)^2\right]\right\} \\
\text{subject to} \quad & C_{Ft}^C = \gamma\alpha\frac{P_t Y_t}{\mathcal{E}_t P_t^*}, \qquad C_{Ft}^R = \gamma\left[\frac{1}{1-\gamma} - \alpha\right]\frac{P_t Y_t}{\mathcal{E}_t P_t^*} \\
& \frac{B_{t+1}^*}{R_t^*} = B_t^* + Q_t^* Y_t^* - P_t^*\big(C_{Ft}^C + C_{Ft}^R\big),
\end{aligned}$$

where we used the fact that consumption of non-tradables is effectively exogenous and the Euler equation (8) is a side equation that pins down the level of financial repression that is necessary to implement the desired allocation. Substitute for C_{Ft}^C and C_{Ft}^R to simplify the planner's objective:

$$\begin{aligned}
\max \quad & \mathbb{E}\sum_{t=0}^{\infty}\beta^t\left\{\log\frac{P_t}{\mathcal{E}_t} - \frac{(1-\omega)\kappa}{2}\left(\frac{B_{t+1}^*}{P_{t+1}^*} - \Psi_t\right)^2\right\} \\
\text{s.t.} \quad & \frac{B_{t+1}^*}{R_t^*} = B_t^* + Q_t^* Y_t^* - \frac{\gamma}{1-\gamma}\frac{P_t Y_t}{\mathcal{E}_t}
\end{aligned}$$

In a model with a representative household $\omega = 0$, we get the same optimality condition (8) as in the laissez-faire equilibrium with $R_{Ht}^* = R_t^*$, i.e., it is suboptimal to use financial repression. On the other hand, in a model with two types of agents, the social losses from suboptimal savings $\frac{(1-\omega)\kappa}{2}$ are lower than the private ones. As a result, the optimal intervention requires setting $R_{Ht}^* < R_t^*$, with the financial repression wedge increasing in ω.

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