International Equity Flows, Monetary Policy, and Time Consistency*

Javier Bianchi
Federal Reserve Bank of Minneapolis

Alejandro Van der Ghote
European Central Bank

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Abstract

This paper studies optimal monetary policy in an open economy with international equity flows. Foreign ownership creates a time-consistency problem: once equity is held abroad, the central bank has an ex post incentive to deviate from the natural allocation, raising real wages, and compressing profits paid to foreign shareholders. Anticipating this discretionary policy response, foreign investors require a discount when purchasing domestic equity, reducing domestic wealth. Because households do not internalize that their collective equity sales exacerbate the central bank's future incentive to compress profits, they over-divest, generating multiple Pareto-ranked equilibria. In the bad equilibrium, equity valuations are depressed and employment is lower. Unlike existing theories of capital-flow management, our model provides a rationale for capital controls on equity inflows.

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1 Introduction

Over the past three decades, international equity flows have expanded markedly, reflecting the increasing depth and integration of global financial markets. As Figure 1 shows, the combined value of foreign direct investment (FDI) and foreign ownership of equity (FOE) has increased from roughly 20% of GDP in 1995 to nearly 80% in 2024. While a common view holds that cross-border equity positions promote risk-sharing and improve welfare, their growing scale raises important questions about their implications for macroeconomic policy and aggregate welfare.

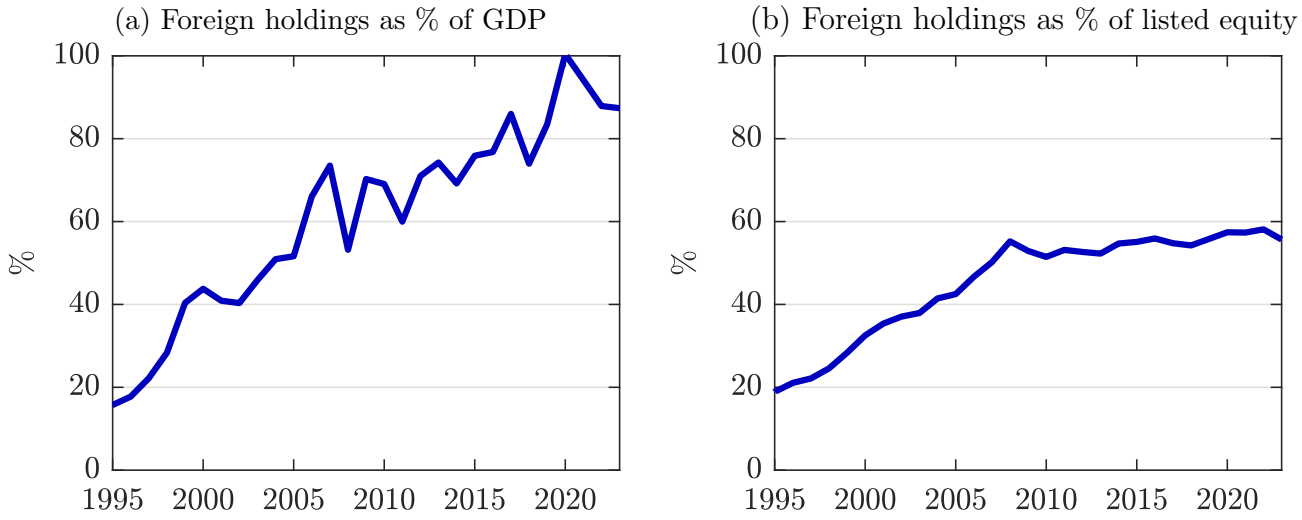

Figure 1: Foreign ownership of domestic equity

Notes: The figure shows the stock of domestic equity owned by foreigners as a share of GDP in panel (a) and as a share of the domestic equity market in panel (b). Foreign ownership of domestic equity is measured as the sum of foreign direct investment (FDI) and foreign ownership of non-financial and bank domestic equity stocks (FOE). The series represent a simple average across the following countries: Austria, Belgium, Brazil, Bulgaria, Canada, Chile, Colombia, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Israel, Italy, Japan, South Korea, Mexico, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Turkey, United Kingdom, and the United States. Data source: External Wealth of Nations (EWN) database (Lane and Milesi-Ferretti, 2018) and OECD National Accounts Statistics.

This paper explores the implications of international equity flows for monetary policy and welfare. We show that foreign ownership of domestic equity introduces a time inconsistency problem for monetary policy, as the central bank has an incentive to depart ex post from the natural allocation in order to reduce firms' profits and erode the value of equity claims held by foreign investors. Moreover, we show that opening to international equity flows exposes the economy to a Pareto-inferior equilibrium in which households sell excessive amounts of domestic equity ex ante. This arises because households do not internalize that greater

foreign ownership exacerbates the central bank's ex-post temptation to reduce profits, which depresses the equity price at which they sell the equity claims.

We formalize these results in a tractable open-economy New Keynesian framework in which households trade domestic equity with foreign investors, in addition to foreign bonds. To transparently illustrate our results, the baseline model abstracts from uncertainty, imperfections in capital markets, and domestic heterogeneity. In the case where households own the entire share of domestic equity, optimal monetary policy attains the natural allocation—equivalently, a zero labor wedge or zero output gap—by targeting a level of employment such that the marginal rate of substitution between consumption and leisure equals the marginal product of labor.

When households own the entire domestic equity stock, an increase in the real wage—holding employment fixed—has no effect on aggregate resources: the induced changes in labor income and profits exactly offset in the representative household's budget constraint. Hence, the split between labor income and profits is irrelevant for allocations. This irrelevance no longer holds when foreign investors own domestic equity. In that case, a higher real wage reduces the profits accruing to foreigners while increasing households' income. Although domestic households also receive less profits per their equity claims, their benefit from higher wages exceeds the loss in equity payouts since they only hold a fraction of the total equity. The split between labor income and profits now matters.

With nominal rigidities, monetary policy can affect real wages; thus, a central bank has an incentive to raise real wages when foreign investors own domestic equity. In our baseline model with nominal wage rigidities, we show that the central bank finds it optimal to over-appreciate the exchange rate relative to the full-employment allocation. The logic is that starting from an allocation with a zero labor wedge, there is a first-order gain from reducing employment because the disutility from working exceeds the marginal utility value of the additional resources, as a share of the output revenue is, in effect, leaked abroad. Accordingly, foreign ownership leads the central bank to appreciate the exchange rate to induce a positive labor wedge, and reallocate resources from foreign investors toward domestic households.

Our key mechanism can be summarized by the central bank's intratemporal optimality condition,

$$-U_h \;=\; \lambda\big(F_h - \theta_1^* \Pi_h\big),$$

where U_h is the marginal disutility of labor, F_h is the marginal product of labor, Π_h is the marginal effect of employment on equilibrium profits, λ is the shadow value of relaxing the country's intertemporal resource constraint, and θ_1^* is the foreign-owned share of domestic equity at the time of the nominal rigidity. With full domestic ownership ($\theta_1^* = 0$), the

condition reduces to the standard efficiency rule that equates the marginal rate of substitution between consumption and leisure to the marginal product of labor. With foreign ownership ($\theta_1^* > 0$), the central bank internalizes that part of the marginal revenue created by higher employment accrues as profits paid abroad. In effect, the domestic marginal benefit of production is reduced by a "leakage" term proportional to foreign equity ownership.

The time-inconsistency problem arises because foreign investors anticipate the central bank's ex-post incentive to erode their profits and therefore purchase equity only at a discount. This lack of commitment reduces the wealth of domestic households. When households sell equity, they fail to internalize that greater foreign ownership intensifies the central bank's incentive to compress future profits, depressing equity valuations today and lowering welfare. As a result, households collectively sell too much equity, generating an ex-post distortion in output without delivering ex-ante benefits.

Moreover, we show that multiple equilibria arise quite naturally. When households sell more assets, this lowers future dividends and reduces the price of equity shares, to the extent that deep-pocket foreign investors take the other side in the market. While individual investors are indifferent between holding or not the equity, collectively, when they sell more equity, these sales reduce domestic wealth. Interestingly, the presence of multiple equilibria is not a result of fire sales and amplification through financial constraints, as it has been explored in the literature.

A key policy implication is that restricting foreign purchases of domestic equity is optimal. When domestic households initially own the entire equity stock, the optimal policy is to shut down all equity flows. This is because any sales of equity result in lower allocative efficiency and financial losses, as investors buy the equity at discounted prices. When foreign investors already hold some equity, there is now a benefit from buying back the equity claims from foreign investors, as this leads to a less distorted economy in period 1. However, as households increase their holdings of domestic equity, this implies they purchase back the equity at a higher price, resulting in a financial loss. The government thus faces a tradeoff between closing the output gap against capital gains accruing to foreigners. At the optimum, the government induces households to repurchase a limited share of the equity held by foreigners.

In one of the extensions of the model, we incorporate non-tradable goods. Our result that monetary policy departs from the natural allocation remains unchanged, but now an important consideration is the impact of the relative price of non-tradables on foreigners' profits. While an appreciation lowers profits in firms in the non-tradable sector in units of domestic currency, the lower output of non-tradables raises its relative price and may increase the profits received by foreign investors in units of tradables. We show that the

implications for monetary policy depend on the elasticity of substitution between tradables and non-tradables. When the elasticity is below one, the increase in the relative price of non-tradables may outweigh the benefits of higher real wages. Therefore, an appreciation is not necessarily optimal. On the other hand, when the elasticity is above one, appreciating the exchange rate remains optimal because the increase in the relative price of non-tradables is small relative to the increase in wages.

Related literature. Our paper belongs to the literature on monetary policy in open economies. A central theme in this literature, as in closed-economy models, is macro-stabilization: when prices are rigid, monetary policy can help align relative prices toward the full-employment or natural allocation (e.g., Friedman, 1953; Mundell, 1960; Schmitt-Grohé and Uribe, 2001). There are also studies that examine channels by which a departure from the natural allocation may be optimal in environments where trade in financial assets is restricted to bonds. One strand of this literature is concerned with terms of trade manipulation. When countries have market power in the tradable goods they produce, central banks can use monetary policy to tilt the terms of trade on their favor (e.g., Obstfeld and Rogoff, 1995 and Corsetti and Pesenti, 2001). Another strand of this literature considers the case when bonds are in domestic currency and analyzes how variations in exchange rates can generate valuation effects on the net foreign asset position. For instance, Fanelli (2023) shows how the optimal monetary policy under commitment balances macro-stabilization and insurance while Ottonello and Perez (2019), Du, Pflueger and Schreger (2020) and Engel and Park (2022) study the resulting inflationary bias when the government cannot commit. In contrast to these contributions, we consider a model with trade in equity claims and show how this gives rise to a novel source of time inconsistency with distinct implications for policy.

Our paper is also related to the literature on international portfolios.[1] A central theme in this literature is understanding the diversification of equity portfolios (e.g., Engel and Matsumoto, 2009; Coeurdacier, Kollmann and Martin, 2010; Kollmann, 2006; Baxter and Jermann, 1997; Devereux and Sutherland, 2006, Tille and Van Wincoop, 2010; Heathcote and Perri, 2013). In contrast to the existing literature, our paper takes a normative perspective and uncovers an aggregate welfare cost from such diversification. In addition, most of these studies are in the context of real models, thus abstracting from the role of monetary policy. A notable exception is Engel and Matsumoto (2009) who show how a portfolio of home and foreign equities and a forward position in foreign exchange can achieve to a first-order the

[1] See, for example, Engel and Matsumoto (2009), Coeurdacier, Kollmann and Martin (2010), Heathcote and Perri (2013); Kollmann (2006); Baxter and Jermann (1997) Devereux and Sutherland (2006), Tille and Van Wincoop (2010).

complete market allocations. However, they do not consider optimal monetary policy.[2]

Our work also relates to recent studies examining the implications of the rise in cross-country asset ownership. Atkeson, Heathcote and Perri (2022) document that the U.S. "exorbitant privilege" from valuation effects largely disappeared post-2007. They show the deterioration is due to the surge in U.S. corporate equity values, driven by a rise in markups. Quadrini and Ríos-Rull (2024) analyze optimal taxation in a setting where multinationals engage in profit shifting. In contrast, our focus is on studying the implications of the rise in cross-country asset ownership for monetary policy.[3]

Our paper is also related to the literature on monetary unions, in particular, those emphasizing how joining a monetary union can deal with time inconsistency problems in monetary policy. In Alesina and Barro (2002), joining a monetary reduces the inflationary bias generated by the time inconsistency problem of monetary policy, as stressed by Barro and Gordon (1983). Fornaro (2022) presents an environment where the central bank has incentives to depreciate the exchange rate to reduce the real value of non-tradable collateral that foreign investors can seize from defaulting firms ex post. Because of this time inconsistency problem, he shows that joining a monetary union can help increase bond inflows. Different from these studies, the time inconsistency problem of monetary policy in this paper is related to international equity flows.

Our paper is also related to the literature on monetary policy with heterogeneous agents in closed economies. Much of the HANK literature assumes an equal share of profits between households or considers setups where equilibrium profits are zero, muting redistributive motives through equity holdings (e.g., Dávila and Schaab, 2023). Broer et al. (2020) analyze the role of the distribution of profits for the transmission mechanism (see also Bilbiie, 2008). Two papers that share a normative focus are Bhandari, Evans, Golosov and Sargent (2021) and Acharya, Challe and Dogra (2020), but examine optimal policy under commitment. Moreover, they assume that fiscal policies are in place that effectively equalize marginal utilities of consumption at the steady state. Thus, while their focus is on how monetary policy can provide insurance against aggregate shocks, we examine a redistribution motive that emerges naturally because the government is unable to tax foreign investors and does not place any weight on their welfare.

We are also related to the literature on capital controls and capital flow management

[2]Of course, models of optimal monetary policy with complete markets implicitly allow trade in equity claims. However, much of this literature (e.g., Clarida et al., 2002; Devereux and Engel, 2003; Obstfeld and Rogoff, 1995; Corsetti et al., 2010) studies optimal policy under commitment and/or limited international cooperation, settings in which the mechanism we highlight is absent.

[3]Empirical contributions include Lane and Milesi-Ferretti (2005); Coppola et al. (2021); Beck et al. (2024).

policies. This literature has developed a rationale for taxes on debt flows based on pecuniary externalities (e.g., Bianchi, 2011) and aggregate demand externalities (e.g., Schmitt-Grohé and Uribe, 2016; Farhi and Werning, 2016). See Bianchi and Lorenzoni (2021) for a review of the literature. In contrast, we provide a rationale for capital controls on equity flows.

Outline. The remainder of the paper is organized as follows. Section 2 introduces the environment. Section 3 studies the optimal exchange rate policy. Section 4 examines the role for capital controls. Section 5 analyzes extensions of the baseline framework. Section 6 concludes.

2 The Model

Consider a small open economy (SOE) with time indexed by $t \in \{0, 1, 2, \ldots\}$. The SOE is composed of a continuum of identical households and firms, and a monetary authority. There is an international financial market with a risk-free bond that pays an exogenous real return. Our key departure from the standard framework is that foreign investors may also trade equity claims on domestic firms.

We restrict attention to a deterministic environment where nominal rigidities will be present at $t = 1$. In addition, our baseline model assumes that households do not face any borrowing limits. This will allow us to highlight the key mechanism at play and characterize analytically the equilibrium. We next describe the decision problems of households, firms, and foreign investors before analyzing the competitive equilibrium and optimal policies.

2.1 Firms

There is a unit mass of identical firms that produce a single final good using labor according to a strictly increasing and strictly concave production function, $F(h)$. We assume that the production function satisfies $F(0) = 0, \lim_{h\to 0} F'(h) = \infty$, and $\lim_{h\to\infty} F'(h) = 0$.

We assume that the final good is tradable in the international market and the law of one price holds. Normalizing the foreign-currency price to one implies that the domestic-currency price of the good is $P_t = E_t$, where E_t denotes the nominal exchange rate, defined as the price of foreign currency in terms of domestic currency.

The firms' problem consists of choosing employment to maximize profits:

$$\max_{h_t \geq 0} \left\{ E_t F(h_t) - W_t h_t \right\}, \tag{1}$$

where W_t is the nominal wage in domestic currency.

Profit maximization implies that labor demand satisfies

$$F'(h_t) = w_t \ , \ \forall t \geq 0. \tag{2}$$

where $w_t \equiv W_t/E_t$ is the real wage. We denote by π_t the firms' profits in units of foreign currency.

2.2 Households

There is a continuum of identical households of measure one. Their preferences are represented by

$$\sum_{t=0}^{\infty} \beta^t \left[u(c_t) - v\left(\ell_t\right)\right] ,$$

where $\beta \in (0,1)$ is the discount factor, c_t denotes consumption, ℓ_t denotes hours worked. The utility function $u(\cdot)$ is strictly increasing and strictly concave, and the disutility from working is strictly increasing and convex. We assume the usual Inada conditions: $\lim_{c\to 0} u'(c) = \infty$, $\lim_{c\to\infty} u'(c) = 0$, $\lim_{\ell\to 0} v'(\ell) = 0$, and $\lim_{\ell\to\infty} v'(\ell) = \infty$.

Households receive labor income, consume, and trade domestic firms' shares and bonds in international financial markets.[4] We let $\theta_t \geq 0$ and b_t respectively denote the holdings of firms' shares and bonds carried to period t (chosen at $t-1$). Bonds are assumed to be one-period and denominated in foreign currency, or equivalently, units of consumption. Firms' shares entitle their owner to a fraction of the firm's profits. Given a constant amount of firms' shares, which we normalize to one, a household that owns θ_t units of equity receive $\pi_t\theta_t$ in period t.

Households' budget constraint is given by

$$c_t = w_t\ell_t + (\pi_t + q_t)\theta_t - q_t\theta_{t+1} + (1+r)b_t - b_{t+1} \, , \tag{3}$$

where q_t is the price of equity (in units of foreign currency), and r is the constant interest rate on bonds. We highlight that while r is exogenously given, the price of equity q_t is endogenously determined in equilibrium. Moreover, we index the price by t to capture that aggregate states will fluctuate over time.

[4] Our results would be unchanged if households were to hold foreign equities in addition to bonds. The reason is that a small open economy's policy does not affect outcomes in foreign markets and the fact that absent uncertainty, bonds and foreign equities are perfect substitutes.

For our baseline model, we assume households do not face borrowing limits except for a no-Ponzi game condition:

$$\lim_{t\to\infty} \frac{b_{t+1} + q_t\theta_{t+1}}{(1+r)^t} \geq 0\,.$$

Wage rigidity. In period $t = 1$, the nominal wage W_1 is rigid. We assume that at that period labor is demand-determined, which means that households must supply the hours of labor that firms demand. We focus attention on the case where hours are evenly distributed across households. Using (2), we then have that the number of hours that each household work in equilibrium must be given by

$$\ell_1 = F'^{-1}\left(\frac{\overline{W}_1}{E_1}\right), \tag{4}$$

where $\overline{W}_1$ denotes the exogenous rigid wage.[5]

Household problem. At every period, households choose consumption, asset portfolio, and labor supply (except at period 1, where the number of labor hours is determined by (4)). We let $V_t(b_t, \theta_t)$ denote the value at the beginning of the period for a household with an initial individual asset portfolio (b_t, θ_t), where we index the value function by t because the aggregate portfolio and thus prices vary over time. The households' optimization problem can be represented recursively as follows:

$$V_t\left(b_t, \theta_t\right) = \max_{c_t, \ell_t, b_{t+1}, \theta_{t+1} \geq 0} \left\{u\left(c_t\right) - v\left(\ell_t\right) + \beta V_{t+1}\left(b_{t+1}, \theta_{t+1}\right)\right\}, \tag{5}$$

subject to the budget constraint

$$c_t = w_t\ell_t + (\pi_t + q_t)\theta_t - q_t\theta_{t+1} + (1+r)b_t - b_{t+1}\,,$$

the labor-supply schedule (4) for $t = 1$, and the no-Ponzi game.

Household optimality requires that

$$u'(c_t)w_t = v'(\ell_t)$$

[5]Our modeling of period-1 wage rigidity is motivated by expositional simplicity and can be extended to allow for wage setting in period 0 with differentiated labor, subject to pricing frictions.

for all $t \neq 1$ and the Euler equations

$$u'(c_t) = \beta(1+r)u'(c_{t+1}) \tag{6}$$

$$q_t\, u'(c_t) \geq \beta(\pi_{t+1} + q_{t+1})u'(c_{t+1}) \tag{7}$$

for all $t \geq 0$, where the second condition holds with equality if $\theta_{t+1} > 0$.

2.3 Foreign investors

The key departure from a standard framework is that foreign investors can buy and sell equity of domestic firms. We assume that foreign investors have deep pockets—i.e., they face no binding wealth or borrowing constraints—and that they face a no-short-selling constraint in domestic equity, so their holdings must be non-negative, $\theta^*_{t+1} \geq 0$. It follows from investors' optimality and (6)-(7), that for the market of equity to clear, it must be that the return on bonds equals the return on firms' shares.[6] That is,

$$1 + r = \frac{\pi_{t+1} + q_{t+1}}{q_t}. \tag{8}$$

Equation (8) implies that both households and foreign investors are indifferent about the composition of their portfolios between equity and bonds.

2.4 Competitive Equilibrium

We can now define a competitive equilibrium for a given exchange rate policy. We restrict attention to a symmetric equilibrium, in which all of the households choose the same portfolios.

Definition 1. Given an initial portfolio (b_0, θ_0), a world real interest rate r, a rigid wage $\overline{W}_1$, and an exchange rate policy, $\{E_t\}_{t=0}^{\infty}$, a *competitive equilibrium* is a sequence of allocations $\{c_t, h_t\}_{t=0}^{\infty}$, portfolios $\{b_{t+1}, \theta_{t+1}, \theta^*_{t+1}\}_{t=0}^{\infty}$, profits π_t, and prices $\{W_t, q_t\}_{t=0}^{\infty}$ such that:

(i) Households optimize. That is, consumption, labor, and the portfolios solve problem (5).

(ii) Firms choose employment optimally. That is, (2) holds.

[6] Foreign investor's portfolio condition is $(1+r)q_t \geq (\pi_{t+1} + q_{t+1})$ with equality if $\theta^*_{t+1} > 0$. Likewise (6)-(7) yield $(1+r)q_t \geq (\pi_{t+1} + q_{t+1})$ with equality if $\theta_{t+1} > 0$. For $\theta_{t+1} + \theta^*_{t+1} = 1$, (8) must hold.

(iii) The price for firms' shares satisfies condition (8) and $\theta_{t+1} + \theta^*_{t+1} = 1$.

Profits, GNI, and balance of payment accounting. A key equilibrium variable in our analysis is firms' profits. Combining (1) and (2), equilibrium profits are a function of aggregate employment only:

$$\pi_t = F(h_t) - F'(h_t)h_t \equiv \Pi(h_t),$$

where the profit function $\Pi(\cdot)$ satisfies $\Pi(0) = 0$ and $\Pi'(h) = -F''(h)h > 0$ for $h > 0$.

Following the standard balance of payment accounting, we define gross national income (GNI), the current account (CA), and the net foreign asset position (NFA) as

$$\begin{aligned} GNI_t &\equiv F(h_t) + rb_t - \theta^*_t \Pi(h_t), \\ CA_t &\equiv GNI_t - c_t, \\ NFA_t &\equiv b_t - q_t \theta^*_t. \end{aligned}$$

GNI is the income accruing to domestic residents: $F(h_t)$ is domestic output, $\theta^*_t \Pi(h_t)$ is profit income paid out to foreign shareholders, and rb_t is interest received on the country's net foreign bond position.[7] The CA measures the economy's net saving vis-a-vis the rest of the world—income accruing to residents minus domestic absorption. The NFA position is the value of foreign assets b_t net of the market value $q_t\theta^*_t$ of domestic equity held by foreigners, which represents a liability for the small open economy.

Using the household budget constraint, market clearing for equity claims $\theta^*_t = 1 - \theta_t$, and the expression for GNI yields the balance of payment condition: a current-account deficit must be financed either by reducing bond holdings b_t or by issuing additional domestic equity to foreign investors (raising θ^*_t):

$$CA_t = (b_{t+1} - b_t) - q_t(\theta^*_{t+1} - \theta^*_t).$$

[7] Notice that we can write the GNI equivalently as

$$GNI_t = \theta_t F(h_t) + (1 - \theta_t)F'(h_t)h_t + rb_t,$$

an average of total output and labor income (weighted by the fraction of equity owned by domestic households) plus interest on foreign bond holdings.

Given this expression, our definition of the NFA, we can express its evolution as

$$NFA_t - NFA_{t-1} = CA_t - \theta_t^*(q_t - q_{t-1}).$$

That is, the change in the NFA position equals the current account plus a valuation term $-\theta_t^*(q_t - q_{t-1})$, which captures capital gains and losses on the outstanding stock of equity claims held by foreign investors.

3 International Equity Flows and Exchange Rate Policy

In this section, we characterize equilibria and analyze the implications of international equity flows for the optimal exchange rate policy. To streamline the analysis, we assume $\beta(1+r) = 1$, so the real interest rate equals the households' discount rate and consumption is constant.

Roadmap. We proceed with our analysis as follows: First, we characterize the steady-state equilibrium for $t \geq 2$. Second, we analyze the competitive equilibrium at $t = 1$ and the optimal exchange rate policy. Finally, we study the scope for capital controls in period $t = 0$.

3.1 Steady-state equilibrium for $t \geq 2$

The assumption that nominal wages are flexible after $t \geq 2$ ensures monetary neutrality in this continuation equilibrium. Moreover, given that $\beta(1 + r) = 1$, we have that all allocations are constant. We use the variables c and h to denote steady-state values. Lemma 1 characterizes this continuation equilibrium for any given exchange rate policy and for any initial portfolio of assets and liabilities that characterizes the economy's NFA position (b_2, θ_2^*).

Lemma 1 (Steady-state equilibrium)**.** *Given an initial portfolio (b_2, θ_2^*), the continuation equilibrium for $t \geq 2$ features constant consumption and labor. In particular, the steady-state values, h and c, are given by*

$$\frac{v'(h)}{u'(c)} = F'(h)\,, \tag{9}$$

$$c = F(h) + rb_2 - \Pi(h)\theta_2^*\,, \tag{10}$$

and the sequence of portfolios $\left\{b_{t+1}, \theta_{t+1}^*\right\}_{t\geq 2}$ and the steady-state price of equity, q, satisfy

$$b_{t+1} - q\,\theta^*_{t+1} = b_2 - q\,\theta^*_2 \tag{11}$$

and

$$q = \frac{F(h) - F'(h)h}{r}. \tag{12}$$

Proof. In Appendix A.1. □

Condition (9) is the standard condition equating the marginal rate of substitution between consumption and labor to the marginal product. For the analysis that follows, it will be useful to define $h = \mathcal{H}(c)$, as the level of employment consistent with (9), where $\mathcal{H}' < 0$, reflecting the standard wealth effect on labor supply.[8]

Condition (10) says that in steady state—when the current account is balanced—consumption equals gross national income (GNI). Condition (11) states that any portfolio of bonds and domestic equity that keeps the NFA constant is consistent with equilibrium, reflecting that households are indifferent across portfolios that deliver the same level of consumption. Condition (12) states the asset price equals the present discounted value of profits.

3.2 Continuation equilibrium at period $t = 1$

In this section, we characterize the equilibrium starting from $t = 1$, given an initial portfolio (b_1, θ^*_1). Using the employment function $\mathcal{H}(\cdot)$ defined above, the following lemma characterizes the equilibrium outcome in period 1 for any given exchange rate E_1 and initial portfolio (b_1, θ^*_1).

Lemma 2 (Equilibrium for $t \geq 1$)**.** *Given an initial portfolio (b_1, θ^*_1), a rigid wage $\overline{W}_1$, an exchange rate E_1, the equilibrium for $t \geq 1$ is such that*

i) h_1 is given by

$$\frac{\overline{W}_1}{E_1} = F'(h_1) \tag{13}$$

ii) $h_t = \mathcal{H}(c)$ for $t > 1$, and $c_t = c$ for $t \geq 1$, with c given by

[8] To see that $\mathcal{H}'(c) < 0$, we differentiate $v'(\mathcal{H}(c)) = F'(\mathcal{H}(c))u'(c)$ and obtain

$$\mathcal{H}'(c) = \frac{u''(c)F'(\mathcal{H}(c))}{v''(\mathcal{H}(c)) - u'(c)F''(\mathcal{H}(c))} < 0,$$

where the inequality follows from $u'' < 0, F'' < 0, v'' > 0$.

$$c = \frac{r}{1+r}\Big[F(h_1) + rb_1 - \Pi(h_1)\theta_1^*\Big] + \frac{1}{1+r}\Big[F\big(\mathcal{H}(c)\big) + rb_1 - \Pi(\mathcal{H}(c))\theta_1^*\Big] \quad (14)$$

iii) $q_t = q$ *with* q *given by* (12) *and the sequence of portfolios are such that*

$$(b_2 - q\,\theta_2^*) \;=\; (b_1 - q\,\theta_1^*) + \frac{F(h_1) - \Pi(h_1)\theta_1^* - \big[F\left(\mathcal{H}(c)\right) - \Pi\left(\mathcal{H}(c)\right)\theta_1^*\big]}{1+r} \quad (15)$$

and $\left\{b_{t+1}, \theta_{t+1}^*\right\}_{t\geq 2}$ *satisfy* (11).

Proof. In Appendix A.4. □

Condition (13) captures that when the nominal wage is preset, the exchange rate pins down the real wage, and employment is determined by firms' demand at that real wage. Condition (14) reflects that consumption must be constant over time, given that $\beta(1+r) = 1$ and that preferences between consumption and labor are separable. The expression for consumption follows from the intertemporal budget constraint: the two terms are the annuity value of period-1 GNI and of future GNI, respectively. Recall that returns on bonds and equity are equal in equilibrium, which implies that households are indifferent across any portfolio of bonds and domestic equity that supports the equilibrium level of consumption.[9] Condition (15) describes the evolution of the NFA. Notice that because in general period-1 GNI differs from the future GNI, the current account in period 1 is not necessarily balanced, hence the NFA varies between periods 1 and 2.

3.3 Optimal exchange rate policy

We now study the problem of a central bank that chooses monetary policy in period 1 to maximize households' welfare in the competitive equilibrium. Notice that by setting the period-1 exchange rate, the central bank can effectively choose labor in period 1. Using Lemma 3, this problem can be formulated as choosing a period-1 level of employment, h_1, a constant level of consumption, c, and an associated steady-state level of employment, $\mathcal{H}(c)$,

[9] Moreover, this also implies that the future GNI can also be expressed as $F(\mathcal{H}(c)) + rNFA_1$.

subject to a country budget constraint. That is, the optimal policy problem is

$$V_1(b_1, \theta_1^*) = \max_{c,h_1} \left\{ u(c) - v(h_1) + \frac{u(c) - v\left(\mathcal{H}(c)\right)}{r} \right\}, \tag{16}$$

subject to

$$\left(\frac{1+r}{r}\right) c = F(h_1) + rb_1 - \Pi(h_1)\theta_1^* + \frac{F\left(\mathcal{H}(c)\right) + rb_1 - \Pi\left(\mathcal{H}(c)\right)\theta_1^*}{r}. \tag{17}$$

Denoting by $\lambda > 0$ the Lagrange multiplier on the intertemporal country budget constraint (14), we have the following optimality condition with respect to period-1 employment h_1:

$$v'(h_1) = \lambda \left[F'(h_1) - \Pi'(h_1)\theta_1^* \right]. \tag{18}$$

Condition (18) equates the marginal disutility of working an additional unit of time in period to the marginal benefits, which are given by the additional period-1 resources times the marginal benefit of relaxing the country budget constraint. Crucially, the change in period-1 resources from a marginal increase in employment is the increase in *output net of the rise in profits*, that is $F'(h_1) - \theta_1^* \Pi'(h_1)$. The latter term captures the additional profits accruing to foreign shareholders, and its effect on domestic resources is

$$-\theta_1^* \Pi'(h_1) = \theta_1^* F''(h_1) h_1 \leq 0,$$

where the inequality is strict whenever $\theta_1^* > 0$ because the production function is strictly concave, $F''(h) < 0$. That is, higher employment raises output but lowers wages—as the central bank needs to depreciate the exchange rate to stimulate labor demand—and thus increases firms' profits. Because a share θ_1^* of firms' profits accrue abroad, a more stimulative policy generates an increase in the effective liabilities that the SOE faces. This is why stimulating employment carries a higher marginal cost compared to the case without foreign ownership.

The optimality condition with respect to consumption c yields

$$u'(c) + \frac{1}{1+r}\Big[- v'\big(\mathcal{H}(c)\big) + \lambda\big(F'\big(\mathcal{H}(c)\big) - \Pi'\big(\mathcal{H}(c)\big)\theta_1^*\big)\Big]\mathcal{H}'(c) = \lambda. \tag{19}$$

Equation (19) states that the marginal benefit of increasing consumption must equal the shadow cost of the additional resources required to finance it. The first term on the left-hand side is the direct marginal utility of an additional permanent unit of consumption. The second term captures the indirect effect of higher consumption on welfare through its impact

on steady-state employment: because $\mathcal{H}'(c) < 0$, an increase in c reduces future hours, which in turn lowers both the marginal disutility from working, $v'\big(\mathcal{H}(c)\big)$, and the marginal annuity value of future output and profits, $F'\left(\mathcal{H}(c)\right) - \Pi'\left(\mathcal{H}(c)\right)\theta_1^*$.

Combining optimality conditions (18) and (19), we obtain

$$\underbrace{F'(h_1)u'(c) - v'(h_1)}_{\text{Labor wedge}} = \left(\frac{\Pi'(h_1)u'(c) - \frac{1}{1+r}\left[\Pi'(h_1)\, v'\big(\mathcal{H}(c)\big) - \Pi'(\mathcal{H}(c))\, v'(h_1)\right] \mathcal{H}'(c)}{1 - \frac{1}{1+r}F'(\mathcal{H}(c))\mathcal{H}'(c)} \right) \theta_1^* \,. \tag{20}$$

The left-hand side of (20) represents the labor wedge. When foreign investors do not own equity claims on domestic firms, $\theta_1^* = 0$, the right-hand side of (20) is zero and the central bank sets the wedge to zero, replicating the flexible-wage (natural) allocation. By contrast, when $\theta_1^* > 0$, the right-hand side of (20) is generally different from zero, so the optimal policy features a non-zero labor wedge and the central bank finds it optimal to depart from the natural allocation. The intuition is that the central bank uses the exchange rate to compress profits accruing to foreign shareholders, thereby reducing the value of the economy's foreign liabilities. As discussed above, a reduction in period-1 employment h_1 reduces contemporaneous profits, which induces the central bank to generate a positive labor wedge, as shown by the first term of the numerator on the right side. However, at the same time, a lower h_1 reduces period-1 total income and the net foreign asset position, which generates a negative wealth effect that induces households to supply more labor in steady state, raising long-run profits. Under the conditions stated in the proposition below, this indirect effect is dominated by the contemporaneous benefit of higher wages in period-1, implying that the right-hand side of (20) is positive and that the optimal labor wedge is strictly positive whenever $\theta_1^* > 0$.

Let the induced labor wedge under optimal exchange rate policy be given by

$$\zeta_1(b_1, \theta_1^*) \equiv u'(c(b_1, \theta_1^*))F'(h_1(b_1, \theta_1^*)) - v'(h_1(b_1, \theta_1^*))$$

where consumption $c(b_1, \theta_1^*)$ and period-1 employment $h_1(b_1, \theta_1^*)$ are determined by (17) and (20), given international portfolio (b_1, θ_1^*). The proposition below establishes conditions under which $\zeta_1(b_1, \theta_1^*) > 0$ whenever $\theta_1^* > 0$.

We make the following assumption

Assumption 1. *The functions $u(\cdot)$, $v(\cdot)$, and $F(\cdot)$ satisfy either one of the following two assumptions:*

(i) Small wealth elasticity of labor: there exists $\varepsilon > 0$ such that

$$\left| \frac{\partial \log \mathcal{H}(c)}{\partial \log c} \right| = \left| \frac{c}{\mathcal{H}(c)} \mathcal{H}'(c) \right| \leq \varepsilon \quad \forall c > 0.$$

(ii) $u(\cdot)$, $v(\cdot)$, and $F(\cdot)$ are isoelastic

Proposition 1 (Positive labor wedge)**.** *Suppose that Assumption 1 holds. Then, $\zeta_1(b_1, \theta_1^*) \geq 0$, with strict inequality if $\theta_1^* > 0$.*

Proof. In Appendix A.2 □

Under (i), wealth effects on labor supply are arbitrarily small. This implies that the change in the net foreign asset position in period 1 does not affect future wages, and hence (20) becomes static and given by

$$F'(h_1)u'(c) - v'(h_1) = \theta_1^* \Pi'(h_1)u'(c) \geq 0\,.$$

That is, the optimal labor wedge is solely determined by the contemporaneous effect of period-1 employment on the share of firm profits accrued by foreigners. Given that $\Pi' > 0$, it follows that the labor wedge is strictly positive for any $\theta_1^* > 0$.

Under (ii) isoelastic functional forms guarantee that the future effects of wealth on future wages are second-order starting from an allocation with a zero labor wedge. It then follows that the central bank chooses to implement an allocation with a strictly positive labor wedge as long as $\theta_1^* > 0$.

Comparative statics. Next, we study how the labor wedge responds to marginal changes in the share of equity owned by foreigners. Naturally, everything else fixed, changes in foreign equity ownership affect the wealth of the SOE and through a resulting wealth effect they affect also the labor wedge. To control for these wealth effects, we restrict attention to perturbations to the overall international portfolio that, absent changes in the price of domestic equities, keep the NFA fixed. Formally, let $q_0(b_1, \theta_1^*)$ denote the equilibrium price of

domestic equities in period 0 given international portfolio (b_1, θ_1^*). This price is given by

$$q_0(b_1, \theta_1^*) = \frac{1}{1+r}\left[\Pi(h_1(b_1, \theta_1^*)) + \frac{1}{r}\,\Pi(\mathcal{H}(c(b_1, \theta_1^*)))\right]. \tag{21}$$

We then consider perturbations of the portfolios such that

$$\hat{\theta}_1^* = \theta_1^* + \hat{\varepsilon} \quad \text{and} \quad \hat{b}_1 = b_1 + q_0\left(b_1, \theta_1^*\right)\hat{\varepsilon}$$

where $\hat{\varepsilon} > 0$.[10]

We have the following proposition

Proposition 2 (Increasing labor wedge)**.** *Suppose that the functions $u(\cdot)$, $v(\cdot)$, and $F(\cdot)$ satisfy the small wealth elasticity of labor of Assumption 1 and F is isoelastic, or that $u(\cdot)$, $v(\cdot)$, and $F(\cdot)$ are isoelastic.*
Then,

$$\left.\frac{dh_1(\hat{b}_1, \hat{\theta}_1^*)}{d\hat{\varepsilon}}\right|_{\hat{\varepsilon}=0} < 0, \quad \left.\frac{dc(\hat{b}_1, \hat{\theta}_1^*)}{d\hat{\varepsilon}}\right|_{\hat{\varepsilon}=0} < 0, \quad \left.\frac{d\zeta_1(\hat{b}_1, \hat{\theta}_1^*)}{d\hat{\varepsilon}}\right|_{\hat{\varepsilon}=0} > 0\,.$$

Proof. In Appendix A.3 □

The proposition shows that an increase in foreign equity leads the central bank to induce lower employment and consumption and a higher labor wedge. That is, keeping wealth constant, higher holdings of domestic equity claims by foreign investors, lead the central bank to follow a tighter monetary policy to reduce payments to foreign investors. We note that assumptions (i)-(ii) are sufficient to guarantee the result, but not necessary.

Foreign equity as a negative productivity shock. To further illustrate the comparative statics, consider the special case where the production function is isoelastic, $F(h) = h^\alpha$ with $\alpha \in (0, 1)$. In this case, GNI_t can be expressed as

$$GNI_t = \left[1 - (1-\alpha)\theta_t^*\right] F\left(h_t\right) + r b_t\,,$$

The factor $(1-\alpha)\theta_t^*$ captures the wedge between domestic production and domestic income induced by foreign equity ownership. Because the monetary authority internalizes that a fraction of firms' profits is repatriated abroad, it behaves as if the economy's effective

[10] Note that $NFA_1 = \hat{b}_1 - q_0\left(b_1, \theta_1^*\right)\hat{\theta}_1^* = b_1 - q_0\left(b_1, \theta_1^*\right)\theta_1^*$ for any $\hat{\varepsilon}$, implying that the NFA would remain constant if equity was evaluated at the original price.

productivity were lower when choosing employment. If the bond position b_t adjusts to keep aggregate wealth constant, this mechanism leads the authority to select a lower level of employment.

3.4 Quantitative results

In this section, we provide a simple quantification to assess the role of international equity flows in shaping the optimal exchange rate policy and the welfare implications. We parametrize $\{u(\cdot), v(\cdot), F(\cdot)\}$ using isoelastic functional forms:

$$u(c) = \frac{1}{1-\frac{1}{\sigma}} c^{1-\frac{1}{\sigma}}, \quad v(\ell) = \chi \frac{1}{1+\psi} \ell^{1+\psi}, \quad F(h) = h^{\alpha},$$

with $\sigma > 0$, $\chi > 0$, $\psi > 0$ and $\alpha \in (0,1)$.

The time period is a year. We set the intertemporal elasticity of substitution to $\sigma = 1$, the inverse labor supply elasticity to $\psi = 1$, the labor share to $\alpha = 0.65$, and the gross interest rate $R = 1.04$. These values are standard in the literature. We also normalize the disutility from labor χ so that output equals 1 under flexible prices.

We set the initial NFA to -60% of output, roughly the U.S. value in 2025. A reference value for θ, following Figure 1, is $\theta = 0.5$. In the simulations below, we consider values for $\theta \in [0,1]$ and adjust the initial bond holdings so that the net foreign asset position remain constant in the flexible price allocation. In particular, we vary b_1 so that $b_1 - \tilde{q}\,\theta_1^* = -60\%$, where $\tilde{q}$ denotes the price of equity under flexible wages.

Figure 2 presents the results for the optimal exchange rate policy at $t = 1$. The top panels plot employment, the labor wedge, and the welfare gains over the natural allocation; the bottom panels display the exchange rate, consumption, and profits. All of these variables are expressed in percentage deviation from an economy without foreign equity ownership (or equivalently flexible prices), except for the labor wedge which is expressed in levels.[11]

When $\theta_1^* = 0$, the optimal policy sets the labor wedge to zero (panel b), reproducing the flexible-wage allocation. As foreign holdings increase, the central bank appreciates the exchange rate (panel [e]), and this leads to lower employment (panel [a]), profits (panel [c]), and consumption (panel [d]). We can see that the deviations from the flexible-price allocation are sizable. For $\theta_1^* = 0.5$, the monetary authority appreciates the exchange rate by 4%, employment falls by about 10%, and consumption declines 0.15% relative to the case without foreign equity ownership.

[11] We normalize the labor wedge by $u'(c)F'(h)$ so that it can be interpreted as a labor income tax.

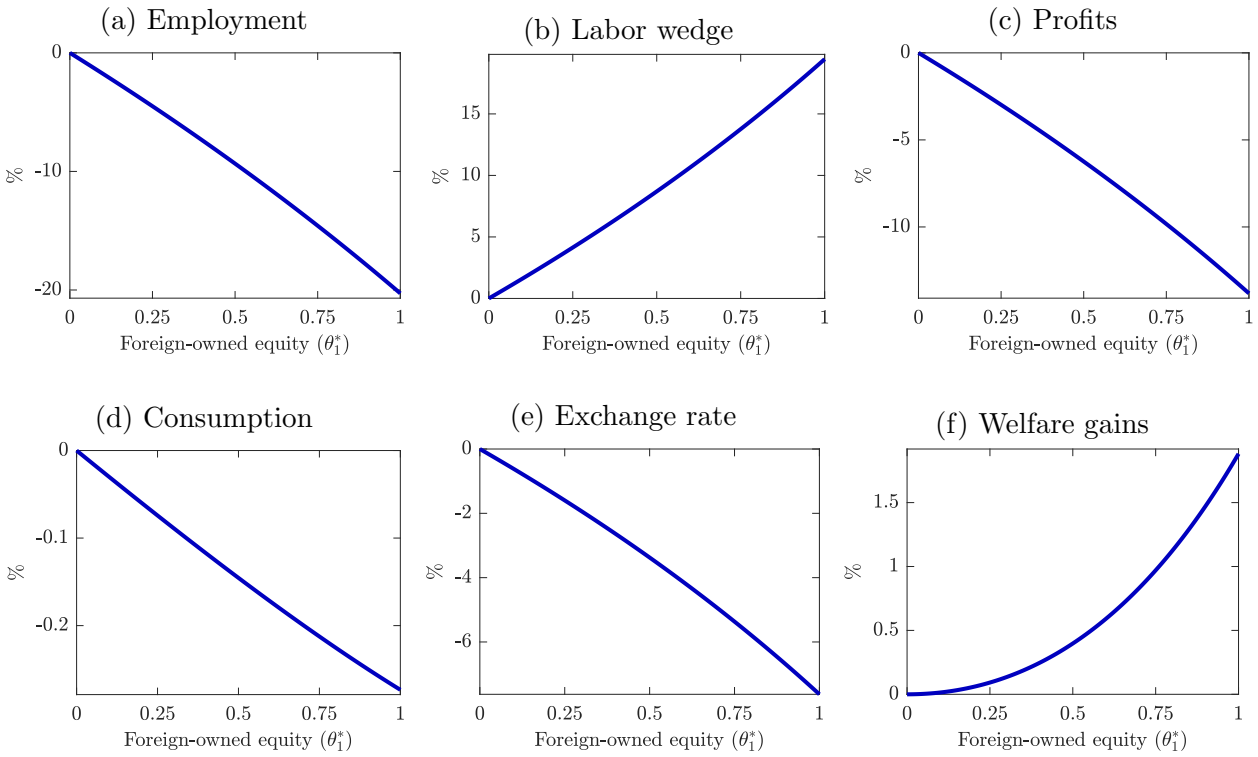

Figure 2: Continuation equilibrium at period $t = 1$ under the optimal exchange rate

Notes: The figure plots the continuation equilibrium at period $t = 1$ under the optimal exchange rate as a function of the foreign-owned fraction of domestic firms' shares. For any given θ_1^* external debt is such that $b_1 = \tilde{q}\,\theta_1^*$, where $\tilde{q}$ is the price of equity under flexible wages. All of the variables except the labor wedge are expressed as deviations from a continuation equilibrium with flexible nominal wages. The labor wedge is instead expressed in percentage points. Welfare gains are computed relative to a policy that keeps the labor wedge at zero. They are represented in terms of period-1 consumption equivalence.

Panel (f) reports the consumption-equivalent welfare gains from adopting the optimal exchange rate policy relative to a benchmark that maintains a zero labor wedge (i.e., the natural allocation). The figure indicates substantial gains from departing from the natural allocation. In the limiting case in which foreign investors own 100% of firms, households would be willing to forgo 1.75% of period-1 consumption to switch to the optimal policy.

Takeaway. This section highlighted the implications of foreign equity ownership for the determination of the optimal exchange rate. The key insight is that when foreigners own equity the central bank has incentives to appreciate the exchange rate beyond the natural allocation to boost real wages and reduce firm profits.

4 International Equity Flows and Capital Controls

We now turn to the determination of the initial portfolio $\{b_1, \theta_1^*\}$ and explore the implications of foreign equity ownership for the desirability of capital controls.

4.1 Equilibria for $t \geq 0$

We study the equilibrium for $t \geq 0$ when the monetary authority is expected to follow at period 1 the optimal exchange rate policy $E_1(b_1, \theta_1^*)$. The lemma below shows that there is a continuum of equilibria with different allocations and welfare implications.

Lemma 3 (Equilibrium)**.** *Given (b_0, θ_0^*) and the period-1 optimal exchange rate policy $E_1(b_1, \theta_1^*)$, there exists a continuum of Pareto ranked competitive equilibria indexed by (b_1, θ_1^*), where the set of possible equilibrium values for (b_1, θ_1^*) is characterized by*

$$c(b_1, \theta_1^*) = F(\mathcal{H}(c(b_1, \theta_1^*))) - \Pi(\mathcal{H}(c(b_1, \theta_1^*)))\theta_0^* + q_0(b_1, \theta_1^*)\,(\theta_1^* - \theta_0^*) + (1+r)b_0 - b_1\,. \quad (22)$$

where q_0 is given by (21).

Proof. In Appendix A.5. □

As in the continuation equilibria in Section 3, households are indifferent among any portfolio of bonds and equity shares that implement the same level of permanent consumption. However, while the indeterminacy in the portfolio was inconsequential in the continuation equilibria, the indeterminacy at period 0 gives rise to multiple equilibria with different prices and allocations. This happens because the portfolio chosen in period 0 influences the period-1 optimal exchange rate, which in turn influences the period-0 equity price and the country-budget constraint (22). In particular, following Proposition 2, when households choose to sell more of their equity claims, the central bank chooses in period 1 a more appreciated exchange rate, lowers firm profits. Since investors perfectly anticipate the central bank decision, they are only willing to buy the equity claims at a lower price, which ultimately erodes the wealth of the SOE as well as it tightens the country-budget constraint.

Figure 3 illustrates the multiplicity of equilibria for the isoelastic case, where we use the same parameter values as in subsection 3.4, and assume that $\theta_0^* = 0$. Panels (a) and (b) respectively present the equity price and consumption in period 0 as a function of the equity claims that households choose to sell in equilibrium. Panel (c) presents the welfare losses relative to the equilibrium where households continue to hold all the equity, in terms of period

0 consumption. The worst equilibrium is the one where households sell the entire equity where the welfare losses are about -2%. In that case, as the figure illustrates, the equity price falls by about 0.4% and consumption falls by roughly 0.3%. This, in turn, significantly reduces consumption and welfare.

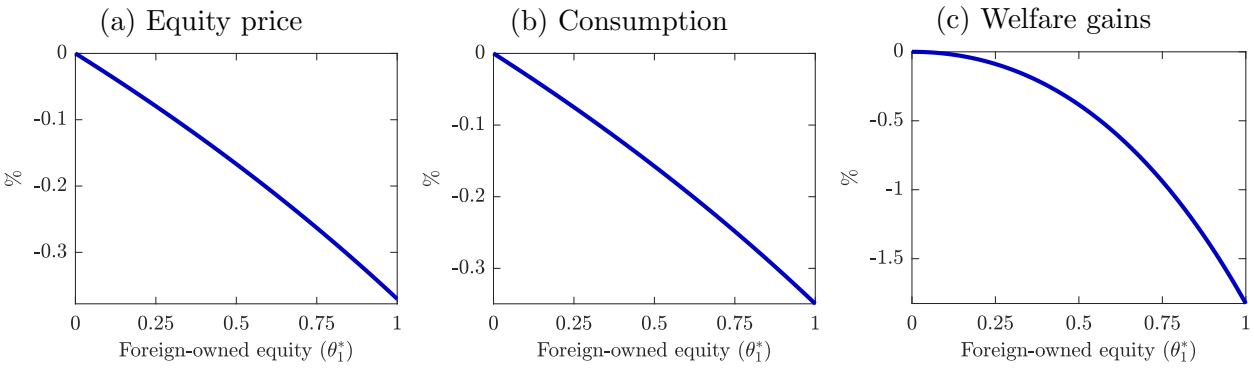

Figure 3: Equilibrium at period $t = 0$ as a function of the capital control

Notes: The figure plots the equilibrium at period $t = 0$ as a function of θ_1^*. The initial bond holdings are such that $b_0 = \theta_0^* \tilde{q}$. The initial foreign ownership is set to $\theta_0^* = 0$.

Time inconsistency and multiple equilibria. The multiplicity of Pareto-ranked equilibria reflects a coordination problem among domestic households. Individually, households are indifferent between holding equity and bonds because both assets deliver the same return in equilibrium. Collectively, however, larger equity sales raise foreign ownership, which exacerbates the central bank's *ex post* incentive to compress profits. Anticipating lower future profits, foreign investors are only willing to purchase domestic equity at a lower price in period 0. This price decline reduces domestic wealth and lowers welfare. At the heart of the coordination failure is limited commitment: once domestic equity is held abroad, the central bank finds it optimal *ex post* to reduce profits, and this validates the lower equity valuation *ex ante*.

On the other hand, if the central bank were instead able to commit, the competitive equilibrium would feature unique values of consumption and labor in all periods, regardless of the portfolio composition chosen by households in period 0. The proposition below formalizes this result, and shows additionally that if $\theta_0^* = 0$, the equilibrium corresponds to the natural allocation.

Proposition 3 (Equilibrium under commitment)**.** *Suppose that the central bank at $t = 0$ can commit to a period-1 exchange rate E_1. Then, given international portfolio*

(b_0, θ_0^*), the competitive equilibrium under the optimal exchange rate features unique values of consumption and labor in all periods. Moreover, if $\theta_0^* = 0$, the optimal period-1 exchange rate policy implements the natural allocation in period 1.

Proof. In Appendix A.6. □

The coordination failure suggests that limiting foreign equity ownership could be desirable, a point we turn next.

4.2 Capital controls on international equity flows

We consider a benevolent domestic financial regulatory authority that can set capital controls on international equity flows in period 0 to maximize the welfare of the households in the SOE. Crucially, the regulatory authority takes into account that monetary policy, in period 1, is set in a time-consistent manner. We assume that in period 0, the regulatory authority chooses the portfolio position directly on behalf of households, and let households choose consumption, labor, and bonds.[12]

The problem of the regulatory authority can then be expressed as

$$V_0(b_0, \theta_0^*) = \max_{c_0, b_1, \theta_1^*} \left\{ u(c_0) - v(\mathcal{H}(c_0)) + \frac{1}{1+r} V_1(b_1, \theta_1^*) \right\}, \tag{23}$$

subject to:

$$c_0 = F(\mathcal{H}(c_0)) - \Pi(\mathcal{H}(c_0))\theta_0^* + q_0(b_1, \theta_1^*)\,(\theta_1^* - \theta_0^*) + (1+r)b_0 - b_1\,,$$

$$c_0 = c(b_1, \theta_1^*)$$

where the budget constraint corresponds to (22), which incorporates that the price at which households sell depend on the endogenous portfolio. The second constraint reflects that because in the initial period households can choose their bond holdings b_1, for any policy $\theta_1^* = 1 - \theta_1$, perfect consumption smoothing must hold in equilibrium.

The proposition below characterizes the optimal capital controls on foreign purchases of domestic equity.[13]

[12] Without loss of generality, we assume that the regulatory authority does not intervene in future periods.

[13] If the regulatory authority could also set on behalf of households their bonding holdings b_1, restricting international equity inflows would be optimal as well. In that case, the problem of the regulatory authority would be given by (23) but without constraint $c_0 = c(b_1, \theta_1^*)$, and the solution to the problem would feature $\theta_1^* = \theta_0^*$.

Proposition 4 (Positive capital controls)**.** *Suppose that either one of the two conditions specified in Proposition 2 holds. Then, the solution to problem (23) is such that*

$$\theta_1^* = \begin{cases} 0 & \text{if } \theta_0^* = 0, \\ \in (0, \theta_0^*) & \text{if } \theta_0^* > 0, \end{cases}$$

Proof. In Appendix A.7. □

Consider first the case with $\theta_0^* = 0$. When initially households own all of the equity shares, the regulatory authority restricts households from selling any equity claims. The reason is as follows. Keeping the same portfolio induces the monetary authority to implement the natural allocation. Moreover, any sales of equity claims would lead the monetary authority to depart from the natural allocation and reduce profits. However, because the reduction in profits is priced ex ante, this implies a financial loss for households. Any sales of equity claims, therefore, result in a distorted allocation and a financial loss.

When $\theta_0^* > 0$, the regulatory authority finds it optimal to induce *equity outflows*. Like in the case with $\theta_0^* = 0$, allowing households to sell domestic equity claims are detrimental because the economy end up with more distorted allocations and with financial losses. Moreover, now there is a benefit from buying back the equity claims from foreign investors, as this leads to a higher allocative efficiency in period 1. However, as households buy more equity, this raises the price of their purchases, leading again to a financial loss. In other words, as households buyback more equity from foreign investors, the foreign investors appropriate in effect part of the higher allocative efficiency gains. At the optimum, the regulatory authority therefore induces a limited amount of buybacks, with $\theta_1^* \in (0, \theta_0^*)$.[14]

5 Extensions

In this section, we extend the theory in two directions. First, we allow for binding financial constraints. Second, we incorporate a non-tradable good in the model.

[14] In our analysis, we have assumed that the regulatory authority only controls equity flows. If the regulatory authority also chooses households' bond position b_1, in addition to equity holdings, the consumption-smoothing constraint $c_0 = c(b_1, \theta_1^*)$ no longer applies. We can show that the optimal policy then leaves foreign equity holdings unchanged, $\theta_1^* = \theta_0^*$ (no equity repurchases or sales), and sets higher initial consumption, $c_0 > c(b_1, \theta_1^*)$. This higher c_0 generates a positive wealth effect that shifts period-0 labor supply inward, raising real wages $w_0 = F'(\mathcal{H}(c_0))$ and reducing firm profits $\Pi(\mathcal{H}(c_0))$. In other words, controls of bond and equity flows allows the SOE to avoid any financial losses, but the period-1 allocation remains distorted as this allows to extract resources from the initial investors.

[....]

6 Conclusion

In this paper, we have examined the implications of international equity flows for monetary policy in a small open economy. We develop a tractable New Keynesian framework in which foreign investors can hold domestic equity claims and the central bank sets the exchange rate under nominal wage rigidity. We show that when foreign investors own domestic equity, the central bank has an incentive to deviate from the natural allocation by appreciating the exchange rate, raising real wages, and compressing the profits that accrue to foreign investors. In effect, foreign ownership acts like a reduction in productivity: from the perspective of the domestic planner, a share of the output leaks in the form of dividends paid to foreigners, and the central bank responds by choosing lower employment than in the flexible-wage allocation.

Foreign ownership creates a novel source of time inconsistency for monetary policy. Anticipating lower returns, foreign investors purchase equity at discounted prices, reducing domestic households' wealth and giving rise to multiple Pareto-ranked equilibria in which the bad equilibrium features larger equity inflows, depressed asset prices, and higher unemployment. To mitigate this time inconsistency problem, we show that it is optimal to manage equity flows. In particular, it is optimal to limit equity inflows ex ante, to reduce the temptation of the central bank to over-appreciate the exchange rate relative to the natural allocation ex post.

Taken together, our results highlight that the globalization of equity portfolios has important implications for monetary policy and for capital flow management. To highlight the key mechanisms at play, we have presented a parsimonious model without risk, frictions on financial intermediaries, heterogeneity, and with a simple temporary nominal rigidity. For future work, it would be valuable to extend the framework along these dimensions and to confront it with data, in order to further analyze the normative implications of foreign equity ownership.

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