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The Financial Resource Curse*

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Abstract

In this paper, we present a model of the financial resource curse (i.e., episodes of abundant access to foreign capital coupled with weak productivity growth). We study a two-sector (i.e., tradable and non-tradable) small open economy. The tradable sector is the engine of growth, and productivity growth is increasing with the amount of labor employed by firms in the tradable sector. A period of large capital inflows, triggered by a fall in the interest rate, is associated with a consumption boom. While the increase in tradable consumption is financed through foreign borrowing, the increase in non-tradable consumption requires a shift of productive resources toward the non-tradable sector at the expenses of the tradable sector. The result is stagnant productivity growth. We show that capital controls can be welfare-enhancing and can be used as a second-best policy tool to mitigate the misallocation of resources during an episode of financial resource curse.

Keywords: Capital controls; capital flows; endogenous growth
JEL classification: *F*32; *F*34; *F*36; *F*41; *F*43

I. Introduction

In recent years, there has been a growing skepticism toward the beneficial effect that episodes of abundant and unregulated capital inflows have on economic performance. For instance, in the wake of the global financial crisis that started in August 2007, several emerging countries have adopted measures to limit the inflows of foreign capital.[1] Often, these interventions

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[1] One example is Brazil, which, in October 2009, introduced a tax of 2 percent on all capital inflows except foreign direct investment. Another well-known example of controls on capital inflows is the Chilean *encaje* of the 1990s.

are justified on the grounds that a large accumulation of foreign debt can put the economy at risk of a financial crisis in the event of a sudden stop (i.e., an abrupt loss of access to foreign financing).[2] Indeed, a growing body of literature shows how capital controls can improve welfare in economies at risk of a sudden stop.[3]

In this paper, we depart from this perspective and we focus on another channel through which a surge in capital inflows can have a negative impact on economic performance. Periods of sustained current-account deficits might be associated with movements of productive resources toward non-tradable sectors, such as construction, in which the scope for productivity gains is limited. This allocation of resources might prevent the development of a dynamic export sector and hinder the long-run competitiveness of the economy. In fact, this concern is often mentioned by policy-makers as a justification for the imposition of controls on capital flows. Despite the relevance of this channel in policy debates, we do not have a simple model of how capital flows affect the sectoral allocation of productive resources and the long-run growth performance of the economy. The objective of this paper is to fill this gap in the literature.

We argue that episodes of cheap and abundant access to foreign capital can be associated with an inefficient allocation of resources. In fact, in our framework, dynamic productivity gains are sector-specific and concentrated in the tradable sectors. Periods of large capital inflows can be coupled with a rise in the importance of the non-tradable sectors at the expenses of the tradable sectors, which translates into stagnant productivity growth. We refer to the link between cheap and abundant access to foreign capital and weak productivity growth as the financial resource curse.

In our view, Spain represents a case of the financial resource curse. Following the accession to the European Monetary Union in 1999 and until 2007, Spain has financed its external imbalances with low interest rates, and has experienced low financing rates in the mortgage market.[4] The top-left

[2] Magud *et al.* (2011) have reviewed the main motives behind capital controls from a policy-maker's perspective. They list four fears: fear of appreciation, fear of hot money, fear of large inflows, and fear of loss of monetary independence.

[3] See Benigno *et al.* (2012), Bianchi (2011), Bianchi and Mendoza (2010), Jeanne and Korinek (2010), and Korinek (2010). In these papers, welfare gains from capital controls arise because of the presence of collateral constraints, giving rise to pecuniary externalities that make the competitive equilibrium inefficient.

[4] The low interest rates experienced by Spain during these years are part of the process of convergence in interest rates across members of the European Monetary Union, characterizing the period before the adoption of the euro. Many authors have linked the convergence in interest rates with the process of financial integration and harmonization of financial market rules within the European Union, as well as with the elimination of currency risk as a result of the creation of the European Monetary Union. This view is maintained, for instance, by Blanchard and Giavazzi (2002).

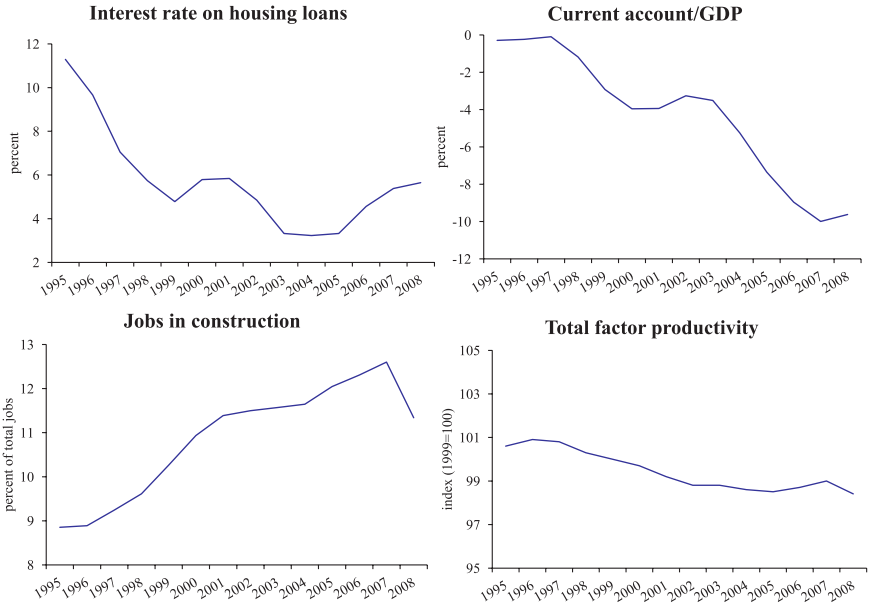

Fig. 1. Motivating facts, Spain 1995–2008
Source: Eurostat.

panel of Figure 1 shows the marked fall in the interest rate on mortgages during the 2000s. As displayed by the top-right panel of Figure 1, this period was also characterized by abundant capital inflows, giving rise to prolonged current-account deficits. In fact, Spain went from an almost balanced current-account position at the inception of the euro to a deficit close to 10 percent of GDP in 2007. The continuous worsening of the Spanish current account was accompanied by a steady rise of employment in the construction sector, and the share of jobs in the construction sector as a percentage of total jobs went from 9 percent in 1995 to almost 13 percent at its peak in 2007 (see the bottom-left panel of Figure 1).[5] During the same period, Spain experienced a declining pattern for total factor

[5] Giavazzi and Spaventa (2010) have highlighted the link between deficits in the current account and booms in the construction sector in countries at the periphery of the euro zone. Moreover, this period was also characterized by a sharp increase in house prices. Because houses represent the most important source of collateral for households, the rise in house prices might have amplified the inflows of capital and the expansion in credit. Coimbra (2010) has provided a model describing this mechanism and has explored empirically the link between house prices, capital inflows, and credit expansion in Spain and Portugal in the aftermath of the creation of the European Monetary Union.

productivity (TFP). The bottom-right panel of Figure 1 shows that TFP fell by around 2 percentage points between 1995 and 2007.[6]

We propose a framework that rationalizes all these facts. We study a two-sector small open economy that is producing tradable and non-tradable consumption goods. The tradable sector is the engine of growth in our economy. First, firms in the tradable sector can reap productivity gains by importing technological knowledge from abroad. In particular, the rate at which foreign knowledge is absorbed is increasing with the amount of labor employed by firms in the tradable sector. Second, technological improvements generate spillovers that are not internalized by atomistic firms. Indeed, in our framework, the non-excludability of knowledge generates externalities, in the spirit of the leading endogenous growth models of Romer (1986,1990), Grossman and Helpman (1991), and Aghion and Howitt (1992). In contrast, the non-tradable sector has no scope for productivity improvements.

We show, not surprisingly, that the amount of labor allocated to the tradable sector is inefficiently low in the competitive equilibrium. The social planner allocates more labor to the tradable sector compared to the competitive equilibrium, because this internalizes the positive impact of labor employed in the production of traded goods on the absorption of foreign knowledge. Indeed, during the transition towards the steady state, an unregulated economy grows at a slower rate and allocates fewer productive resources towards the tradable sector compared to the first-best. A benevolent government can replicate the allocation of the social planner and can attain the first-best by subsidizing firms in the tradable sector.

We then consider an episode of cheap and abundant access to foreign capital, triggered by a fall in the world interest rate. This experiment captures the persistent fall in real interest rates characterizing countries at the periphery of the euro zone in the aftermath of the launch of the euro. A decrease in the world interest rate leads to a consumption boom, affecting both tradable and non-tradable consumption goods. While the increase in tradable consumption is financed with foreign borrowing, the increase in non-tradable consumption occurs through a shift of productive resources toward the non-tradable sector. This reallocation of labor away from the tradable sector slows down the process of foreign technology absorption and generates a period of low productivity growth.

In our framework, not only is a period of large capital inflows associated with stagnant productivity growth, but it could also be costly in welfare terms. In fact, capital inflows exacerbate the externality arising from the non-excludability of knowledge. The result is that if the externality is

[6] The pattern of productivity in Spain during the last two decades has been discussed by Felgueroso and Jiménez-Martín (2009).

sufficiently strong, a drop in the interest rate could have a negative impact on welfare.

From a policy perspective, a benevolent government reacts to low interest rates by increasing the subsidy to firms in the traded sector, so as to counteract the impact of capital inflows on the allocation of labor. If sectoral subsidies are not available, capital controls can be used as a second-best policy tool to mitigate the negative impact of low interest rates on productivity growth. In fact, if the government responds to the fall in the interest rate by imposing a tax on capital inflows, it discourages foreign borrowing, thus limiting the consumption boom, the reallocation of productive resources toward the non-tradable sector, and the consequent fall in productivity growth. In this sense, our model helps to rationalize the use of capital controls to preserve competitiveness in the tradable sector in countries undergoing a period of abundant access to foreign capital.[7]

The rest of the paper is structured as follows. We start by discussing the process of knowledge absorption at the heart of our model and the related body of literature. We introduce the model in Section II. In Section III, we derive the social-planning allocation and show how sectoral subsidies can restore the first-best. We then analyze the properties of the model using numerical simulations. In Section IV, we present the baseline parametrization and compare the transition toward the steady state in the competitive equilibrium and in the social-planning allocation. In Section V, we consider the impact of a period of low interest rates and show that under the competitive equilibrium the effect on welfare can be negative. In Section VI, we discuss the role of capital controls. We conclude in Section VII.

Discussion of Growth Process

Our analysis has both a positive component and a normative component. Our positive analysis rests on one key element: faster productivity growth in the tradable sectors compared to the sectors producing non-tradable goods. Instead, the key assumption behind our normative implications is the presence of stronger externalities in the process of knowledge accumulation in the tradable sectors compared to the non-tradable sectors. Here, we discuss the empirical evidence that underpins these assumptions.

The existing empirical evidence points toward faster productivity growth in the tradable sectors compared to the non-tradable sectors. Using data from OECD countries during the period 1970–1985, De Gregorio *et al.*

[7] To be clear, our notion of competitiveness is based on technical efficiency. The term "competitiveness" could also denote the ability to maintain the price of exports low compared to other countries, a topic on which our analysis is silent.

(1994) have found that TFP grows faster in the tradable goods sector relative to the non-tradable sectors. Duarte and Restuccia (2010) have reached the same conclusion, using data from 29 countries, including both OECD and emerging economies, for the period 1956–2004. They have found that labor productivity grows faster in manufacturing and agriculture, the two sectors that produce the bulk of tradable goods, while productivity growth is smaller in services, the sector traditionally associated with non-tradable goods.[8]

The engine of growth in our model is the absorption of foreign knowledge.[9] Productivity grows faster in the tradable sector because firms in the non-tradable sector do not benefit from foreign knowledge spillovers. This stark assumption simplifies the exposition, but our qualitative results would hold as long as foreign knowledge spillovers are more pronounced in the tradable sectors compared to the non-tradable sectors. In a recent paper, Rodrik (2013) has considered cross-country convergence in productivity at the industry level and has found that this is present only in the manufacturing sectors. Similarly, Duarte and Restuccia (2010) have found that convergence in productivity takes place in agriculture and manufacturing, but not in services. These findings are consistent with the idea that international knowledge spillovers are more intense in the sectors producing tradable goods.[10]

Moreover, there is a body of literature that emphasizes the role of trade in fostering the absorption of foreign knowledge and productivity growth. Coe *et al.* (1997) and Amiti and Konings (2007) have provided empirical evidence in support of a positive impact of imports of foreign intermediate goods on productivity. There is also substantial firm-level empirical

[8] Faster productivity growth in tradable sectors also characterizes Spain between 1999 and 2007. During this period, labor productivity in tradable sectors grew, on average, by 1.4 percent per year, against a -0.4 percent average growth rate for non-tradable sectors. We have computed these statistics using data from Eurostat, and we have defined non-tradable sectors as the aggregate of construction, wholesale, and retail trade, financial services, and public services, while tradable sectors are the aggregate of the residual sectors (i.e., agriculture and industry excluding construction). We thank Nathan Converse for help with the data.

[9] There is a vast body of literature emphasizing the role of cross-country knowledge spillovers. Early theoretical contributions to this body of literature are Grossman and Helpman (1991) and Parente and Prescott (1994). Klenow and Rodriguez-Clare (2005) have concluded that international knowledge spillovers are key in explaining the cross-country growth patterns observed in the data.

[10] In addition, Rodrik (2008) has provided some indirect evidence consistent with the assumption of more intense knowledge accumulation in the tradable sectors. In fact, he has found that real exchange rate depreciations are associated with faster productivity growth in developing countries and that this effect is increasing with the size of the tradable sector. However, as suggested by Woodford (2009), more research is needed to assess the direction of causality.

evidence pointing at a positive effect on productivity from exporting, the so-called learning-by-exporting effect. Learning-by-exporting has been detected by Blalock and Gertler (2004) in Indonesia, by Van Biesebroeck (2005) in sub-Saharan African countries, by De Loecker (2007, 2010) in Slovenia, by Park *et al.* (2010) in China, and by Manjón *et al.* (2013) in Spain.[11] Importantly for our purposes, this body of literature indicates that a well-developed tradable sector stimulates foreign knowledge absorption and productivity growth.[12]

In our model, the absorption of foreign knowledge increases with the amount of labor employed in the tradable sector. This feature of the model links our paper to the body of literature emphasizing the role of human capital in boosting the absorption of foreign technology. This body of literature, pioneered by Nelson and Phelps (1966) and later developed by Benhabib and Spiegel (2005), provides empirical evidence in favor of a role of the stock of human capital in the absorption of foreign knowledge. Different from this body of literature, we emphasize the impact of the sectoral allocation of a productive resource on the ability to absorb foreign knowledge. Indeed, in many cases, episodes of abundant capital inflows ended up financing investment in the construction sector.[13] This is a low-skilled sector and its development can have a negative impact on the stock of human capital and on the absorption of foreign knowledge.[14] Our growth process captures this channel of transmission, albeit in a very stylized form, if the amount of labor employed by the tradable sector is interpreted as a proxy for the stock of human capital.

The key assumption for our normative results is the presence of stronger externalities in the process of knowledge accumulation in the tradable sectors compared to the non-tradable sectors. In our model, externalities arise

[11] De Loecker (2010) has given an excellent discussion of the recent methodological advances that have allowed the identification of learning-by-exporting effects.

[12] The importance of trade for productivity growth is also supported by the empirical analysis of Alcalà and Ciccone (2004), who have found evidence in favor of a positive impact of trade on productivity.

[13] Besides Spain, following its accession to the European Monetary Union, other examples of surges in capital inflows associated with construction booms are Mexico in the early 1990s (Pickering, 2000), Chile in the early 1980s, several East Asian countries in the run-up to the 1997 financial crisis (Hernández and Landerretche, 2011), and Ireland between 1999 and 2007 (Giavazzi and Spaventa, 2010). More broadly, episodes of abundant capital inflows tend to be coupled with rises in the relative importance of non-tradable sectors compared with sectors producing tradable goods, as documented by Tornell and Westermann (2002) and Mendoza and Terrones (2008).

[14] Going back to the case of Spain, Aparicio (2010) has shown that there is a positive link between the rise in employment in the construction sector and the increase in the dropout rate from high school of young Spaniards during the boom in capital inflows following Spain's accession to the euro.

because knowledge is a non-excludable good, and hence it can be used freely by any firm in the economy. This assumption captures the fact that the knowledge accumulated inside a firm can, at least partly, spill over to other firms (e.g., through imitation or through the hiring of workers who embody the technical knowledge developed in a rival firm).[15] Indeed, the assumption that knowledge is only partially excludable is a feature of the most influential endogenous growth frameworks, such as the models developed by Romer (1986, 1990), Grossman and Helpman (1991), and Aghion and Howitt (1992). While, for simplicity, we assume that knowledge is a completely non-excludable good, the mechanism that we describe would still hold in a framework in which knowledge is partially excludable. An open empirical question is whether certain sectors of the economy, notably the ones producing tradable goods, are subject to stronger externalities. Although more research is needed to shed light on this important issue, the existing empirical evidence points toward the presence of externalities in the manufacturing sector (Cingano and Schivardi, 2004; Driver *et al.*, 2006), a sector producing mainly tradable goods.

Related Body of Literature

Our paper is related to different strands of the literature. First, our paper is related to the body of literature on the resource curse, also known as the Dutch disease. This body of literature, surveyed by Frankel (2010) and Van der Ploeg (2011), highlights different channels through which the discovery of natural resources can have a detrimental impact on economic performance or welfare.[16] Our paper is particularly close to models in which the discovery of natural resources negatively affects economic performance because of the presence of learning-by-doing effects in the tradable sector. Krugman (1987) has provided an early formalization of this effect.[17] Different from the existing body of literature, our resource curse does not arise from the discovery of natural resources or because of an exogenous transfer from abroad, but rather because of a period of abundant access to foreign capital. We call this effect the financial resource

[15] Hausmann and Rodrik (2003) have claimed that a fundamental source of externalities in the process of foreign knowledge absorption is the discovery of what a country is good at producing. Their view is that the private incentives for starting the domestic production of goods that were previously produced abroad are too low from a social perspective. This is because discovering the cost of producing a new good domestically is a risky activity, whose fruits can be easily appropriated by others through imitation.

[16] Corden and Neary (1982) have carried out an early theoretical study of the natural resource curse.

[17] See also Matsuyama (1992), who has discussed the impact of a surge in productivity in agriculture in the presence of learning-by-doing in manufacturing.

curse. The distinction is important, because capital inflows are endogenous in our model and hence policy tools, such as capital controls, which have not been studied by the traditional resource-curse body of literature, can play a role in mitigating the financial resource curse.

Our paper is also related to the body of literature concerned with the study of the optimality of capital controls. Capital controls are welfare-enhancing in Bianchi (2011), Jeanne and Korinek (2010) and Korinek (2010) because of a pecuniary externality stemming from the presence of a relative price in the borrowing constraint, However, Benigno *et al.* (2012) have shown that in this context, price support policies are superior to capital controls because they achieve the unconstrained allocation. In Costinot *et al.* (2011) and De Paoli and Lipinska (2012), capital controls can increase welfare by affecting the terms of trade, while Bacchetta *et al.* (2011) show that capital controls can have a positive effect on welfare when the domestic financial sector is underdeveloped. Capital controls might also be desirable if the nominal exchange rate is fixed and nominal wages are downwardly rigid, as discussed by Schmitt-Grohé and Uribe (2012). Instead, we focus on capital controls as a policy tool to correct the inefficient sectoral allocation of productive resources arising from the combination of knowledge spillovers in the tradable sectors and capital flows.

From an empirical point of view, our analysis is inspired by the reading of the euro area experience, in the run-up to the crisis, by Giavazzi and Spaventa (2010). They have emphasized the link between the sectoral allocation of productive resources and external debt sustainability, while we focus on the misallocation of productive resources caused by the interaction between endogenous capital flows and growth externalities.[18] Another channel of resource misallocation has been analyzed theoretically by Aoki *et al.* (2010). There, the misallocation arises from domestic credit frictions that prevent the efficient allocation of resources across firms with different productivity.[19]

Finally, a recent body of literature (Aizenman and Lee, 2007, 2010; Korinek and Servén, 2010; Benigno and Fornaro, 2012) has used models with growth externalities to address the motives behind reserve accumulation. In particular, Aizenman and Lee (2010) consider a model in which a learning-by-doing externality operates in the traded sector only. While we share similar assumptions about the growth process of the economy, our analysis focuses on the role of endogenous capital inflows and capital

[18] In their framework, the sectoral allocation of resources is indeed efficient.

[19] Reis (2013) has used this framework to explain the low growth characterizing Portugal between 2000 and 2007. As discussed by Aoki *et al.* (2009), the misallocation of resources can be amplified if collateral depends on asset prices and surges in capital inflows are associated with boom–bust cycles in asset prices.

controls, abstracting from policy consideration in terms of reserve accumulation.

II. Model

We consider a perfect foresight infinite-horizon small open economy. Time is discrete and indexed by t. The economy is populated by a continuum of mass 1 of identical households and by a large number of firms.

Households

The representative household derives utility from consumption and supplies inelastically L units of labor each period. The household's lifetime utility is given by

$$\sum_{t=0}^{\infty} \beta^t \log(C_t). \tag{1}$$

In this expression, $\beta < 1$ is the subjective discount factor and C_t denotes the consumption of a composite good. C_t is defined as a Cobb–Douglas aggregator of tradable C_t^{T} and non-tradable C_t^{N} consumption goods

$$C_t = \left(C_t^T\right)^{\omega}\left(C_t^{\mathrm{N}}\right)^{1-\omega}, \tag{2}$$

where $0 < \omega < 1$ denotes the share of expenditure in consumption that the household assigns to the tradable good.[20]

The budget constraint of the household is

$$C_t^{\mathrm{T}} + P_t^{\mathrm{N}} C_t^{\mathrm{N}} + \frac{B_{t+1}}{R_t} = W_t L + B_t + \Pi_t. \tag{3}$$

The budget constraint is expressed in units of the tradable good, whose price is constant and normalized to 1. The left-hand side represents the household's expenditure. We define P_t^{N} as the relative price of the non-tradable good in terms of the tradable good, so $C_t^{\mathrm{T}} + P_t^{\mathrm{N}} C_t^{\mathrm{N}}$ is the household's consumption expenditure expressed in units of the tradable good. Here, B_{t+1} is the stock of one-period risk-free bonds purchased by the household at price $1/R_t$, and R_t is the gross world interest rate, which is exogenous from the perspective of the small open economy.

The right-hand side represents the income of the household. Throughout the paper, we focus on equilibria in which firms in both sectors produce.[21]

[20] The assumption of a Cobb–Douglas aggregator of tradable and non-tradable consumption goods ensures the existence of a balanced growth path. See footnote 28 online for further discussion.

[21] This is always the case in the numerical simulations presented in the following.

This means that firms in both sectors pay the same wage W_t, and so $W_t L$ is the labor income received by the household. Here, B_t is the gross return on the stock of bonds purchased by the household at time $t-1$. Finally, domestic firms in both sectors are wholly owned by domestic households and Π_t denotes the profits received from firms by the representative household.

Each period, the representative household chooses C_t^{T}, C_t^{N}, and B_{t+1} to maximize utility (1) subject to the budget constraint (3). The first-order conditions are

$$\frac{\omega}{C_t^{\mathrm{T}}} = \lambda_t \tag{4}$$

$$\frac{1-\omega}{C_t^{\mathrm{N}}} = \lambda_t P_t^{\mathrm{N}} \tag{5}$$

$$\lambda_t = \beta R_t \lambda_{t+1}, \tag{6}$$

where λ_t denotes the Lagrange multiplier associated with the budget constraint (i.e., the household's marginal utility of wealth). By combining the optimality conditions (4) and (5), we obtain the standard intratemporal equilibrium condition that links the relative price of non-tradable goods to the marginal rate of substitution between tradable and non-tradable goods:

$$P_t^{\mathrm{N}} = \frac{1-\omega}{\omega}\frac{C_t^{\mathrm{T}}}{C_t^{\mathrm{N}}}.$$

According to this expression, P_t^{N} is increasing with C_t^{T} and decreasing with C_t^{N}. In what follows, we use P_t^{N} as a proxy for the real exchange rate.

The last first-order condition (6) is the standard Euler equation, which determines the intertemporal allocation of tradable consumption between a generic period t and the subsequent period $t+1$.

Firms

Firms operate in two sectors: one sector produces the tradable good and the other sector produces the non-tradable good.

Tradable Sector. In the tradable sector, there are a large number of firms that produce using labor L_t^{T} and the stock of knowledge A_t, according to the production function

$$Y_t^{\mathrm{T}} = A_t L_t^{\mathrm{T}}, \tag{7}$$

where Y_t^{T} is the amount of tradable goods produced in period t.

Knowledge is non-rival and non-excludable and so it can be freely used by firms producing tradable goods. Hence, the only production cost incurred by firms in the tradable sector is the wage bill $W_t L_t^{\mathrm{T}}$. Profits can then be written as

$$\Pi_t^{\mathrm{T}} = Y_t^{\mathrm{T}} - W_t L_t^{\mathrm{T}},$$

and profit maximization implies that

$$A_t = W_t.$$

This expression says that at the optimum, firms equalize the marginal profit from an increase in labor (i.e., the left-hand side of the expression) to the marginal cost (i.e., the right-hand side).

Knowledge Accumulation. The key feature of our small open economy is the endogenous process of knowledge accumulation. In particular, the stock of knowledge available to firms in the tradable sector evolves according to

$$A_{t+1} = A_t \left[1 + c L_t^{\mathrm{T}} \left(1 - \frac{A_t}{A_t^*} \right) \right], \tag{8}$$

where $c > 0$ is a parameter determining the impact of the sectoral labor allocation on productivity growth, and A_t^* denotes the stock of knowledge of the world technological leader, which grows at the constant rate g^*.[22]

The stock of knowledge in a generic period t depends not only on past knowledge, but also on the amount of labor employed in the tradable sector. This formulation captures the idea that human capital contributes to the absorption of foreign knowledge, as in Nelson and Phelps (1966) and Benhabib and Spiegel (2005). Moreover, in our model the tradable sector is the source of convergence in productivity, in the spirit of the empirical findings of Duarte and Restuccia (2010) and Rodrik (2013).

Let us start by considering the implications for the steady state. In the steady state, both A and A^* grow at the common rate g^*. If we denote by $a_t = A_t / A_t^*$ the proximity of the country to the world technological frontier, we find that in the steady state

$$\bar{a} = 1 - \frac{g^*}{c \bar{L}^{\mathrm{T}}},$$

where an upper bar denotes the steady-state value of the corresponding variable. This equation implies that in the steady state, the proximity of the

[22] The assumption of an exogenous world technological frontier means that the economy under consideration is too small to have an impact on the evolution of the world's stock of knowledge.

economy to the world technological frontier is increasing with the stock of workers employed in the tradable sector.[23]

Moreover, the allocation of labor across the two sectors also influences the transition toward the steady state. In particular, in the numerical simulations, we consider the case of a country that starts below its steady-state proximity to the frontier (i.e., $a_0 < \bar{a}$). In this case, during the transition to the steady state, the stock of knowledge of the economy grows at a rate higher than that of the world technological frontier. As we show, a higher amount of labor employed in the tradable sector implies faster convergence toward the steady state.

As mentioned above, we assume that knowledge is a non-rival and non-excludable good. This assumption, combined with the presence of a large number of firms in the tradable sector, implies that firms do not internalize the impact of their actions on the evolution of the economy's stock of knowledge. This is a typical growth externality: firms do not internalize the social value of allocating labor to the tradable sector, because they do not consider the impact of their actions on the growth rate of aggregate productivity.

Non-Tradable Sector. The non-tradable good is produced using labor only, according to the production function $Y_t^{\mathrm{N}} = L_t^{\mathrm{N}}$. Here, Y_t^{N} is the output of the non-tradable good, while L_t^{N} is the amount of labor employed by firms in the non-tradable sector. Profits in the non-tradable sector are

$$\Pi_t^{\mathrm{N}} = P_t^{\mathrm{N}} Y_t^{\mathrm{N}} - W_t L_t^{\mathrm{N}}.$$

The condition for profit maximization in the non-tradable sector is $W_t^{\mathrm{N}} = P_t^{\mathrm{N}}$.

If we combine the optimality conditions of the firms in the two sectors, we obtain

$$P_t^{\mathrm{N}} = A_t. \tag{9}$$

Equation (9) highlights the fact that, in the model, productivity advances in the tradable sector correspond to real exchange rate appreciations. This is the classic Balassa–Samuelson effect. In fact, the real exchange rate is just a function of relative productivities, and it does not depend directly on the intratemporal allocation of consumption.[24] This is important because in

[23] This equation also tells us that in order to have a positive productivity in the steady state, c has to satisfy the condition $c > g^*/\bar{L}^{\mathrm{T}}$. We limit the analysis to values of c such that this condition holds.

[24] See Jeanne (2012) for a discussion of capital account policies in a model in which the real exchange rate is determined by the sectoral allocation of consumption.

our model the inefficient allocation of resources does not translate into a misaligned real exchange rate.[25]

Market Clearing and Competitive Equilibrium

Market clearing for the non-tradable good requires that the amount consumed is equal to the amount produced:

$$C_t^{\mathrm{N}} = L_t^{\mathrm{N}}. \tag{10}$$

Combining equation (10) with the households' budget constraint (3), the equations for firms' profits, and the equilibrium condition $\Pi_t = \Pi_t^{\mathrm{T}} + \Pi_t^{\mathrm{N}}$, we obtain the market clearing condition for the tradable good:

$$C_t^{\mathrm{T}} = Y_t^{\mathrm{T}} - \frac{B_{t+1}}{R_t} + B_t. \tag{11}$$

Equation (11) can be rearranged to derive the current account. In fact, the end-of-period net foreign asset position of the country is equal to the end-of-period holdings of bonds of the representative household divided by the world interest rate[26]

$$NFA_t = \frac{B_{t+1}}{R_t}.$$

The market clearing condition for the tradable good can then be rearranged to obtain the law of motion for the stock of net foreign assets, that is, the current account

$$NFA_t - NFA_{t-1} = CA_t = Y_t^{\mathrm{T}} - C_t^{\mathrm{T}} + B_t\left(1 - \frac{1}{R_{t-1}}\right),$$

The current account is given by net exports, $Y_t^{\mathrm{T}} - C_t^{\mathrm{T}}$, plus net interest payments on the stock of net foreign assets owned by the country at the start of the period, $B_t(1 - 1/R_{t-1})$.

Finally, in equilibrium, labor supply by households must equal labor demand from firms

$$L = L_t^{\mathrm{T}} + L_t^{\mathrm{N}}. \tag{12}$$

We are now ready to define a perfect-foresight equilibrium as a set of processes $\{C_t, C_t^{\mathrm{T}}, C_t^{\mathrm{N}}, P_t^{\mathrm{N}}, B_{t+1}, \lambda_t, Y_t^{\mathrm{T}}, L_t^{\mathrm{T}}, A_{t+1}, L_t^{\mathrm{N}}\}_{t=0}^{\infty}$ satisfying equations (2) and (4)–(12), given the exogenous processes $\{R_t, A_t^*\}_{t=0}^{\infty}$ and initial conditions B_0 and A_0.

[25] Of course, the literature has not yet converged on a clear definition of exchange rate misalignment. Here, we refer to a misalignment of the real exchange rate as a deviation of the real exchange rate from the trend implied by the Balassa–Samuelson effect, as done, for example, by Rodrik (2008) in his empirical analysis.

[26] We follow the convention of netting interest payments out of the net foreign asset position.

III. Social Planner and Optimal Policy

Because firms do not internalize the effect of their labor choice on the stock of knowledge, the competitive equilibrium allocation is not efficient. It is then useful to study first the allocation of the social planner in order to understand the implications of the growth externality present in the model.

The social planner chooses $\{C_t^{\mathrm{N}}, C_t^{\mathrm{T}}, L_t^{\mathrm{T}}, L_t^{\mathrm{N}}, B_{t+1}, A_{t+1}\}_{t=0}^{\infty}$ to maximize households' expected utility (1), subject to the economy-wide resource constraints (7), (10), (11), and (12). Importantly, the social planner takes into account the effect that the allocation of labor has on the accumulation of knowledge. Thus, the equation describing the evolution of the stock of knowledge (8) also enters as a constraint in the planner's problem.

The first-order conditions of the planner's problem can be written as

$$\frac{(1-\omega)}{C_t^{\mathrm{N}}} = \hat{\lambda}_t^{\mathrm{N}}$$

$$\frac{\omega}{C_t^{\mathrm{T}}} = \hat{\lambda}_t^{\mathrm{T}}$$

$$A_t[\hat{\lambda}_t^{\mathrm{T}} + c(1-a_t)\gamma_t] = \hat{\lambda}_t^{\mathrm{N}}$$

$$\hat{\lambda}_t^{\mathrm{T}} = \beta R_t \hat{\lambda}_{t+1}^{\mathrm{T}}$$

$$\gamma_t = \beta\gamma_{t+1}[1 + cL_{t+1}^{\mathrm{T}}(1-2a_{t+1})] + \beta\hat{\lambda}_{t+1}L_{t+1}^{\mathrm{T}}. \tag{13}$$

Here, $\hat{\lambda}_t^{\mathrm{N}}$, $\hat{\lambda}_t^{\mathrm{T}}$, and γ_t are the Lagrange multipliers on constraints (10), (11), and (8), respectively.

As we can see in the numerical experiments presented in the following, the social planner allocates more labor to the tradable sector compared to the competitive equilibrium. To gain intuition about this result, it is useful to consider the first-order condition determining the social planner's allocation of labor:

$$A_t[\hat{\lambda}_t^{\mathrm{T}} + \underbrace{c(1-a_t)\gamma_t}_{\text{externality}}] = \hat{\lambda}_t^{\mathrm{N}}.$$

If the labor allocation has no impact on productivity growth, then $c = 0$. By defining $P_t^{\mathrm{N}} = \hat{\lambda}_t^{\mathrm{N}}/\hat{\lambda}_t^{\mathrm{T}}$, it is easy to see that the social-planning allocation and the competitive equilibrium coincide. Instead, whenever $c > 0$, we find that $\hat{\lambda}_t^{\mathrm{N}}/\hat{\lambda}_t^{\mathrm{T}} > \lambda_t^{\mathrm{N}}/\lambda_t^{\mathrm{T}}$, which implies that the consumption of the non-traded good, and so the amount of labor allocated to the non-traded sector, is lower in the social-planning allocation compared to the competitive equilibrium. This happens because the social planner internalizes the fact that an increase in the amount of labor employed in the tradable sector generates a rise in productivity growth. This effect is increasing with

Table 1. *Parameters*

Parameter	Symbol	Value
Growth rate of the technological frontier	g^*	0.015
World interest rate	R	1.04
Discount factor	β	0.976
Endowment of labor	L	1
Initial NFA	B_0	0
Initial TFP of the technological leader	A_0^*	6.4405
Initial TFP	A_0	4.1384
Constant in knowledge accumulation process	c	0.167
Share of tradable goods in consumption	ω	0.414

the Lagrange multiplier γ_t. The multiplier γ_t, defined by equation (13), captures the marginal value that the planner attaches to an increase in productivity.

There are a number of ways in which the social-planning allocation can be decentralized in the competitive equilibrium. For instance, the social-planning allocation can be decentralized by subsidizing employment in the tradable sector. Suppose that the government provides each firm in the tradable sector with a subsidy to production $\sigma_t A_t L_t^{\mathrm{T}}$, financed through lump-sum taxes. Profits of firms in the tradable sector are then given by

$$\Pi_t^{\mathrm{T}} = (1+\sigma_t) A_t L_t^{\mathrm{T}} - W_t L_t^{\mathrm{T}} - T_t,$$

where $T_t = \sigma_t A_t L_t^{\mathrm{T}}$ is a lump-sum tax used by the government to finance the subsidy. Then, the first-best allocation can be replicated by setting

$$\sigma_t = \frac{c(1-a_t)\gamma_t}{\hat{\lambda}_t^{\mathrm{T}}}. \tag{14}$$

Everything else held equal, this expression implies that the stronger the impact of labor allocation on productivity growth (i.e., the higher c is), then the higher the subsidy given to firms in the tradable sector must be in order to attain the first-best.

IV. Numerical Experiments

Parameters

We study the properties of the model using numerical simulations. We solve the model using a standard shooting algorithm.[27] Our framework is too simple to lend itself to a careful calibration exercise. Hence, our

[27] More precisely, we estimate the path of consumption of the traded good. Using this estimate, we solve the model and check whether the intertemporal resource constraint of the

strategy consists in choosing reasonable values for the parameters in order to illustrate the model's properties, while we leave the study of a more realistic framework for future research.

A period in the model corresponds to one year. We set the growth rate of the technological frontier to $g^* = 0.015$, to match the average annual growth rate of TFP in the US between 1960 and 1995, as computed by Benhabib and Spiegel (2005). In the benchmark parametrization, the world interest rate is assumed to be constant and to be equal to $R = 1.04$. The discount factor is set to $\beta = 0.976$, so that in the steady state, consumption of tradable goods grows at the same rate as the world technological frontier. This essentially means that the economy shares the same discount factor as the rest of the world. The endowment of labor is normalized to $L = 1$. We assume that the economy starts with zero net foreign assets and we set $B_0 = 0$.

The initial values for the stock of knowledge of the home country and of the world technological leader are chosen following the TFP estimates reported by Benhabib and Spiegel (2005). In particular, we set the initial stock of knowledge of the technological leader to $A_0^* = 6.4405$, which corresponds to TFP in the US in 1995. The initial stock of knowledge in the home country is set to $A_0 = 4.1384$, which corresponds to TFP in Spain in 1995. This calibration implies an initial proximity to the frontier equal to $a_0 = 0.6426$.

We set c and ω to match two historical statistics for Spain: the evolution of TFP between 1960 and 1995 and the ratio of non-tradable-to-tradable GDP in 1986. We simulate the model using as initial conditions $A_0 = 1.8502$ and $A_0^* = 3.7648$, the estimates of TFP in 1960 in Spain and the US, respectively, provided by Benhabib and Spiegel (2005). We set $c = 0.167$, so that after 35 periods the model reproduces the TFP observed in Spain in 1995. The share of tradable goods in consumption is chosen to be equal to $\omega = 0.414$, so that after 26 years the ratio $P_t^{\mathrm{N}} Y_t^{\mathrm{N}} / Y_t^{\mathrm{T}}$ equals 1.69, the ratio of non-tradable-to-tradable GDP in Spain in 1986, as estimated by de Córdoba and Kehoe (2000).

Transition toward the Steady State

Here, we compare the transition toward the steady state in the competitive equilibrium without policy intervention and in the social-planning allocation. This comparison is useful to understand the dynamics of the model and the impact of the growth externality.

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economy is satisfied. If this is not the case, we update the estimate of the consumption of the traded good.

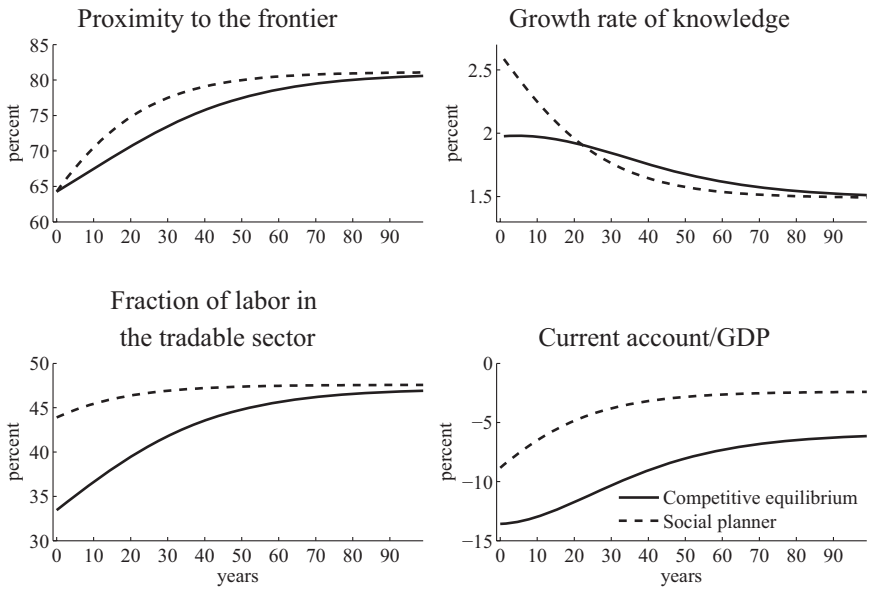

Fig. 2. Transition toward the steady state

The solid lines in Figure 2 show the transition toward the steady state of the economy without policy intervention. The economy starts below its steady-state proximity to the frontier, so during the transition, the stock of knowledge grows faster than the growth rate of the world technological frontier, and the economy experiences a period of technological catch-up. Indeed, initially, annual productivity growth is close to 2 percent, 0.5 percentage points higher than in the steady state.

Moreover, while the economy approaches the steady state, the fraction of labor allocated to the tradable sector rises. In fact, in the steady state, the fraction of labor allocated to the tradable sector is around 10 percentage points higher compared to the start of the transition. This occurs because as the stock of knowledge available for the production of tradable goods increases, it becomes more profitable to employ labor in the tradable sector. As labor flows toward the tradable sector, the production and consumption of non-tradable goods decrease and the relative price of non-tradable goods rises, increasing the profitability of employing labor in the non-tradable sector. In the steady state, this second effect counteracts the first effect and the share of labor allocated to the tradable sector is constant.[28]

[28] In reality, the development process is characterized by a progressive shift of employment toward services, a sector producing mainly non-tradable goods (Duarte and Restuccia, 2010). To reconcile our model with this fact, we could follow the literature on structural change

Finally, during the transition, the economy runs current-account deficits. Initially, the current-account-to-GDP ratio is close to −15 percent, while in the steady state the ratio is close to −7 percent. The deficits in the current account are due to the fact that during the convergence process, the output of tradable goods grows at a faster rate than in the steady state. Because, in the benchmark economy, consumption of tradables grows at the same rate as the world technological frontier, households want to frontload part of their consumption stream. Hence, households borrow from foreign investors, generating deficits in the current account.

The transition in the social-planning allocation, shown by the dashed lines in Figure 2, is qualitatively similar to the one in the competitive equilibrium. The main difference is that the speed of convergence toward the steady state is higher in the social-planning allocation. In fact, in the competitive equilibrium, the fraction of labor allocated to the tradable sector, and hence the rate at which foreign knowledge is absorbed, is systematically lower along the transition path. The differences in the sectoral allocation of labor are because the social planner internalizes the process of knowledge accumulation. Moreover, the social planner runs smaller current-account deficits compared to the competitive equilibrium during the transition, because the social planner finances the consumption of traded goods relatively more through production than imports, compared to the competitive equilibrium.

V. Low Interest Rates and the Financial Resource Curse

In this section, we consider an episode of abundant capital inflows triggered by a temporary fall in the world interest rate. In particular, we assume that the world interest rate falls to 1 percent for 10 years, and then returns to its steady-state value of 4 percent. This experiment captures, in a simple way, episodes such as the large capital inflows experienced by countries at the periphery of the euro zone in the run-up to the recent financial crisis.

Figure 3 displays the results of our experiment. The solid lines show the transition of the benchmark economy, with constant interest rates, while the dashed lines represent the economy that experiences 10 years of cheap credit.

The fall in the world interest rate induces households to increase foreign borrowing and the economy experiences a period of sizable current-account

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and assume an elasticity of substitution between tradables and non-tradables smaller than one, as in Ngai and Pissarides (2007), or other modifications of the utility function that introduce income effects in consumption choices (Matsuyama, 2009; Duarte and Restuccia, 2010). We prefer to abstract from these effects because we want to keep our model simple, and because we are interested in the medium-run impact of an episode of abundant capital inflows, rather than on the long-run growth path of the economy.

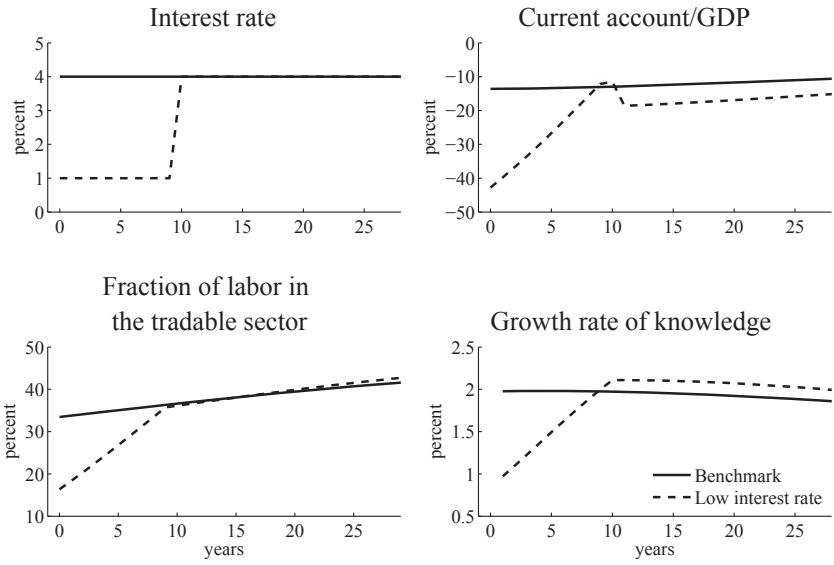

Fig. 3. Response to a fall in the world interest rate

deficits. In fact, a fall in the world interest rate of 3 percentage points initially generates a fall in the current-account-to-GDP ratio of more than 30 percent.[29]

Moreover, low interest rates generate a shift of labor toward the non-tradable sector. This happens because the improved access to foreign financing generates a consumption boom. The increase in tradable consumption is attained through a rise in imports. Instead, the only way to increase the consumption of non-tradables is to increase their production, and so low interest rates imply a shift of labor toward the non-tradable sector compared to the benchmark economy.

The reallocation of labor toward the non-tradable sector reduces the economy's ability to absorb foreign knowledge and slows down the growth rate of productivity compared to the benchmark economy. Through this channel, in our model a period of cheap credit leads to stagnant productivity growth.

[29] Quantitatively, the impact of the interest rate drop on the current account seems to be unrealistically large. To obtain more realistic quantitative implications, we could enrich the model by introducing features that dampen the response of the current account to interest rate shocks. For instance, we could assume that debt contracts are not perfectly enforceable, so that domestic households are subject to borrowing constraints. We could also assume frictions on the mobility of labor between the traded sector and the non-traded sector, as pointed out by de Córdoba and Kehoe (2000). Finally, we could consider economies characterized by lower values of the intertemporal substitution elasticity.

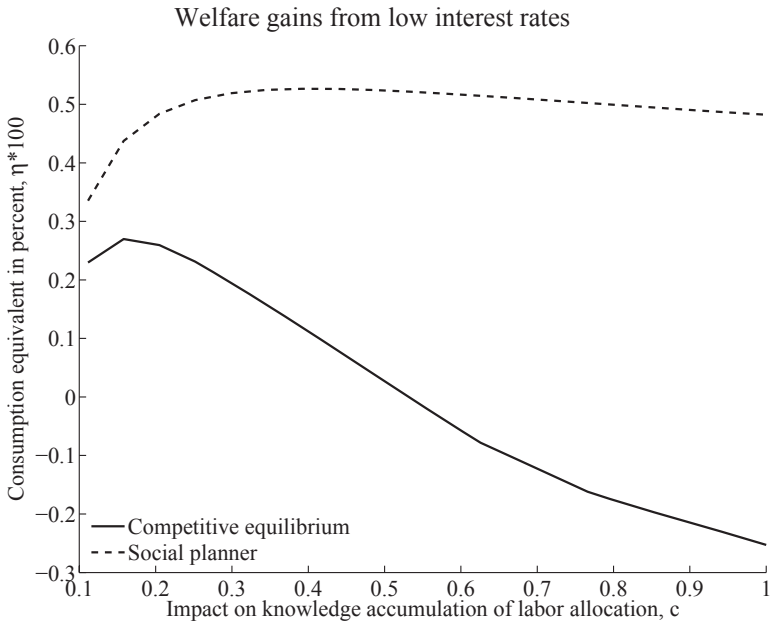

Fig. 4. Impact of a low interest rate on welfare as a function of c

Turning to welfare, while in the neoclassical growth model lower interest rates have a beneficial impact on welfare for borrowing economies, in our framework this is not always the case. To highlight this property of the model, we compute the impact on welfare of 10 years of low interest rates as the percentage increase in consumption that the representative household has to receive at any future date in order to be indifferent between staying in the benchmark economy or moving to the economy with initially low interest rates. Formally, the welfare gain η is defined as

$$\sum_{t=0}^{\infty} \beta^t \log\left[(1+\eta)C_t^{\mathrm{B}}\right] = \sum_{t=0}^{\infty} \beta^t \log\left(C_t^{\mathrm{LR}}\right), \tag{15}$$

where the superscripts "B" and "LR" denote allocations in the benchmark economy and in the economy with initially low interest rates, respectively.

Figure 4 displays the consumption equivalent η as a function of c, the parameter determining the impact of the labor allocation on growth.[30] The solid lines refer to the competitive equilibrium, while the dashed lines refer to the social-planning allocation.

[30] We have restricted attention to values of c that are large enough so that, during the transition, the economy grows faster than the technological frontier and runs current-account deficits.

The first thing to notice is that the gains from the low interest rate are larger under the social-planning allocation. This happens because the social planner internalizes the impact of labor allocation on growth, and hence reacts to capital inflows by allocating more labor to the tradable sector compared to the competitive equilibrium.

The second result is that, while in general lower interest rates are associated with welfare gains even in the competitive equilibrium, for high values of c a period of cheap foreign credit can produce welfare losses. Indeed, for our benchmark value of $c = 0.167$, the representative household enjoys an increase in utility from 10 years of low interest rates, equivalent to a 0.2 percent increase in its consumption stream. Instead, if c exceeds a threshold, which is slightly greater than 0.5, η turns negative, meaning that the drop in the interest rate has a negative impact on welfare.

There are two effects at play. On the one hand, a lower interest rate has a positive impact on welfare, because *ceteris paribus* it leads to an increase in the present value of the economy's output. On the other hand, the drop in the interest rate exacerbates the growth externality by inducing a shift of productive resources away from the tradable sector and slowing down the process of productivity growth. As the parameter c increases, the second effect tends to outweigh the first, and the impact on welfare of a drop in the interest rate is more likely to be negative. In contrast, in the social-planning allocation, the second effect is not present, because the allocation of productive resources is efficient, and the impact on welfare of a drop in the interest rate is always positive.[31]

As we have mentioned above, a benevolent government can attain the first-best by subsidizing firms in the tradable sector. It is then interesting to think about how the optimal subsidy responds to a fall in the interest rate. Figure 5 displays the path for the optimal subsidy to production in the tradable sector.[32] The figure compares the path of the subsidy

[31] Also, in the case of the social planner, the welfare gains from low interest rates are at first increasing with c, but after a threshold is passed they start to decrease. To understand why this happens, consider that the welfare gains from a drop in the interest rate are increasing with the present value of income. On the one hand, a higher c is associated with faster growth and higher productivity in the steady state. This effect points toward a positive relationship between c and the welfare gains from a fall in the interest rate. On the other hand, even in the social-planning allocation, a drop in the interest rate generates some reallocation of labor toward the non-tradable sector, which slows down the process of productivity convergence and reduces the present value of income. This effect is stronger when c is higher, and hence it points toward a negative relationship between c and the welfare gains from a fall in the interest rate. For values of c that are small enough, the first effect prevails, and the positive impact on welfare from low interest rates increases with c. After a threshold is passed, the second effect becomes more important and the welfare gains from low interest rates start to decrease with c.

[32] The figure refers to the baseline value of $c = 0.167$.

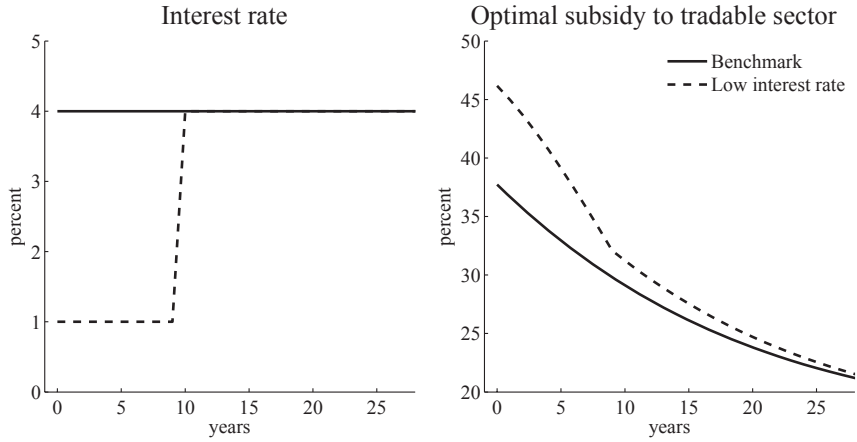

Fig. 5. Optimal subsidy to firms in the tradable sector

in the benchmark economy with constant interest rate (shown by solid lines), to the one of the economy that experiences 10 years of low interest rates (shown by dashed lines). In both cases, the subsidy decreases over time. This happens because as the economy approaches the technological frontier, the gains from the absorption of foreign knowledge diminish.

In addition, the government reacts to a fall in the interest rate by increasing the subsidy to production in the tradable sector. The increase in the subsidy partly counteracts the effect of capital inflows on the allocation of labor, mitigating the negative impact of low interest rates on productivity growth.

VI. Capital Controls

A fall in the world interest rate generates an episode of the financial resource curse: large capital inflows coupled with stagnant productivity. Moreover, a drop in the interest rate can have a negative impact on welfare, because it induces an increase in borrowing and a shift of productive resources away from the tradable sector, which slows down the absorption of foreign knowledge. It is then natural to ask whether policies that counteract the rise in borrowing following a fall in the interest rate can lead to welfare gains. In this section, we consider a government that responds to a fall in the world interest rate by imposing controls on capital inflows.

We model controls on capital inflows as a tax that influences the borrowing decisions of households. The budget constraint of the household is

now

$$C_t^{\mathrm{T}} + P_t^{\mathrm{N}} C_t^{\mathrm{N}} + \frac{B_{t+1}}{R_t(1+\tau_t)} = W_t L + B_t + \Pi_t + TR_t,$$

where τ is a tax on capital inflows and $TR_t = -\tau_t B_{t+1}/[R_t(1+\tau_t)]$ is a lump-sum transfer that the government uses to balance its budget every period. The Euler equation of the household is

$$\lambda_t = \beta R_t(1+\tau_t)\lambda_{t+1}.$$

This expression highlights how the tax affects borrowing decisions. For instance, a rise in τ increases the effective interest rate faced by the household and reduces the household's incentive to borrow.

To evaluate the impact of capital controls on welfare, we perform a simple policy experiment. As in the previous section, we consider the impact on welfare of 10 years of low interest rates. Specifically, we compare welfare between an economy that faces a constant interest rate equal to 4 percent and an economy that experiences a low interest rate of 1 percent for 10 years, after which the interest rate goes back to its steady-state value of 4 percent. Unlike in the previous section, we now assume that the government reacts to the fall in the interest rate by imposing a constant tax on capital inflows throughout the 10 periods of low interest rate. As a measure of welfare, we compute η, the percentage increase in consumption stream that leaves a household indifferent between having a constant interest rate or facing 10 years of low interest rates, as defined by equation (15).

Figure 6 plots η as a function of the tax on capital inflows τ.[33] The relation between welfare gains from low interest rates and the tax on capital inflows is an inverted U. Moreover, the figure shows that imposing a tax on capital inflows tends to increase the welfare gains from an episode of low interest rates. In particular, welfare is maximized when the government reacts to the fall in the interest rate by imposing a tax equal to 1.5 percent.

The intuition is the following. On the one hand, a rise in the tax discourages borrowing, preventing the fall in the production of traded good. This is shown by Figure 7, which compares the response to a drop in the interest rate in an economy without policy intervention to an economy with a constant tax rate equal to 1.5 percent. By sustaining employment in the tradable sector, the tax has a positive impact on knowledge absorption, growth, and welfare. On the other hand, a rise in the tax induces a distortion in the optimal smoothing of the consumption stream, carrying a negative impact on welfare. For initially low levels of the tax, the first effect prevails, and welfare rises as the tax increases. After the tax

[33] The other parameters are kept to their baseline values. In particular, c is set to 0.167.

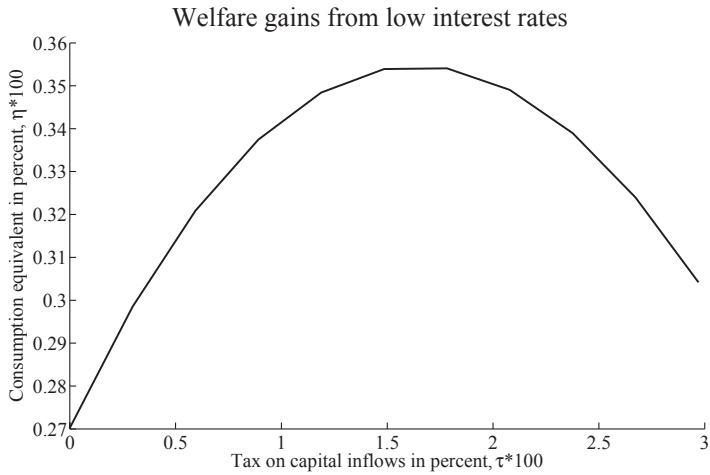

Fig. 6. Impact of a low interest rate on welfare as a function of τ

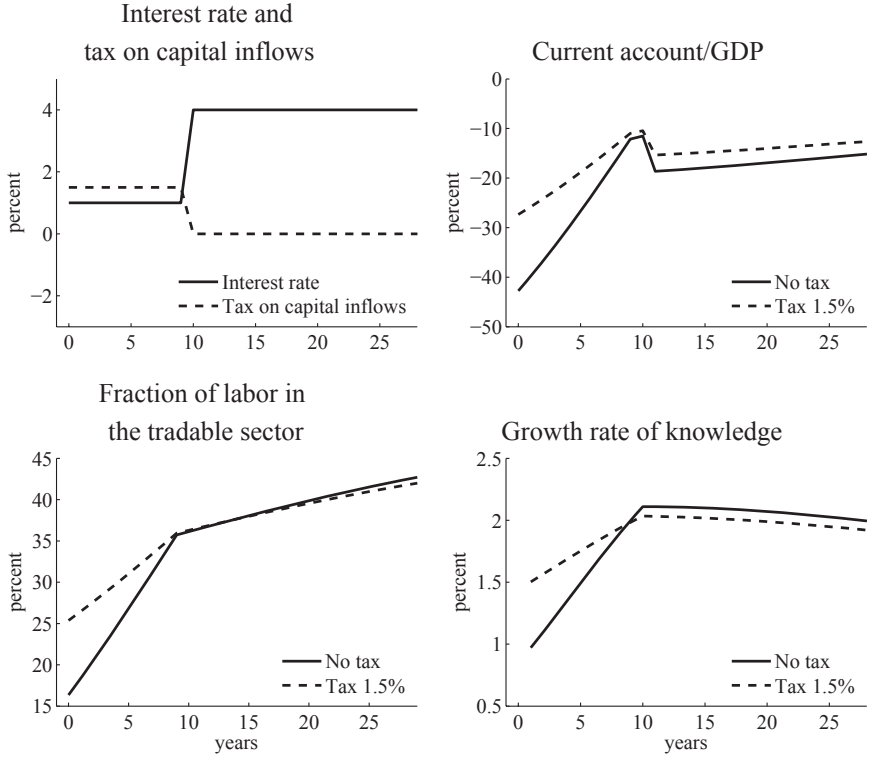

Fig. 7. Response to a fall in the interest rate with capital controls

has reached a threshold, the second effect outweighs the first, and further increases in the tax have a negative impact on welfare.

This result suggests that knowledge externalities in the tradable sector can justify the imposition of capital controls. This is particularly true if policies such as sectoral subsidies are not available (e.g., because of trade agreements that rule out subsidies to firms in the export sector).

VII. Conclusions

In this paper, we have studied one peril of large capital inflows. When the economy is subject to structural asymmetries so that growth externalities are concentrated in the tradable sector, episodes of large capital inflows might be associated with stagnant productivity growth because resources tend to be inefficiently allocated towards the non-tradable sector.

Scope for policy interventions arises because the resource misallocation results in a lower growth rate of the economy compared to the case in which capital inflows are intermediated efficiently (i.e., the social-planning equilibrium). We show how it is possible to design sectoral subsidies to achieve the efficient allocation and we discuss how second-best policy tools, such as capital controls, could be used to improve upon the unregulated economy.

We call the pattern of large capital inflows, consumption boom, and stagnant productivity the financial resource curse and suggest that this framework could be useful in interpreting the case of Spain in the period 1999–2007.

Our analysis here has focused only on the resource misallocation aspect of the financial resource curse but, as past experiences suggest, episodes of large inflows might be followed by a rapid reversal of those flows, associated with crisis events. We plan, in future research, to study the interaction between the financial resource curse and the possibility of crisis events.

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