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Article

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A signaling model of foreign direct investment attraction[☆]

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Abstract

Foreign direct investors face uncertainty about government's type of the host country. In a two period game, we allow the host country's government to mitigate such uncertainty by sending a signal through fiscal policy. Our main finding states that a populist government may mimic a conservative one in order to attract foreign direct investment (FDI), and this choice depends mainly on its impatience degree and the originally planned FDI stock. We highlight the role of the government's reputation in attracting foreign capital and thus provide some policy implications. Moreover, our model explains why some governments considered to be populist adopt conservative policies in the beginning of its terms of office.

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Resumo

Investidores estrangeiros diretos são incertos sobre o tipo do governo do país onde desejam investir. Em um jogo de dois períodos, permitimos que o governo de tal país mitigue essa incerteza ao enviar um sinal através da política fiscal. Nosso principal resultado estabelece que um governo populista pode imitar um conservador a fim de atrair investimento estrangeiro direto (IED), e essa escolha depende principalmente do grau de impaciência e do estoque de IED originalmente planejado. Destacamos o papel da reputação do governo em atrair capital externo e assim fornecemos algumas recomendações de política. Além disso, nosso modelo explica porque alguns governos considerados populistas adotam políticas conservadoras no início do seus mandatos.

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Palavras-chave: Sinalização; Investimento estrangeiro direto; Teoria dos jogos

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1. Introduction

It is well known that developing countries, in general, suffer from low availability of capital stock domestically. One of the possible solutions for this shortcoming is to attract foreign capital through foreign direct investment (FDI) (Bengoa and Sanchez-Robles, 2003; De Mello, 1997). From the investor's point of view, however, the investment in a foreign country has additional sources of uncertainty, when compared to a domestic one. However, as many of economic and political variables are under the government's control (Cantor and Packer, 1996; Kamin and Von Kleist, 1999; Min, 1998), it can use economic policies to affect the perception of risk – by keeping a balanced budget and fighting inflation, for example – and then to encourage inward FDI in its country.

We model the investment decision of a foreign direct investor through a signaling game of two periods. By assuming he faces uncertainty – he does not know whether taxes on foreign capital will increase or whether it will be expropriated in the future, for instance – we are able to study how government can affect this decision by implementing contractionary policies, which might indicate a government committed to pay its debts and to maintain a good institutional environment. Our main finding states that the populist government may mimic the conservative one in order to attract FDI, and this choice depends mainly on its impatience degree and the originally planned FDI stock.

The core of our model is the assumption that fiscal policy can send a signal to the investors about how foreign-capital-friendly the host country is. However, we must highlight that the link between fiscal policy and FDI we model in this paper is substantially different from that in most empirical literature. Instead of repelling foreign capital, as we assume, active fiscal policy has been found to attract it. As the survey provided by Simões et al. (2014) shows, such literature focuses on how FDI is affected by the income tax rate enforced in the domestic country, the fiscal harmonization, the complexity of the fiscal system and the relationship between territories with non-existent (or extremely low) fiscal regimes and FDI. Thus, given that in our model the only fiscal policy tool is the public goods provision (see Section 2.1), our effects tend to be different from those found by those studies. Nevertheless, depending on the type of public good provided – education services, for example – our link may generate a result similar to those found in the literature.

The idea underlying our novel framework is that, regardless its use, large public expenditure requires either increases in government debt or collecting large amount of tax. The former option clearly repels foreign capital by raising the default probability. Regarding the latter, as high tax on income and on spending on goods and services may decrease consumption, they make the domestic market less attractive to the foreign investor. Further, taxes on profit and on capital gain reinforce this negative effect. This implies that even if the government budget is balanced, as we assume below, large public expenditure may repel FDI. Our assumption is supported by empirical evidence reported by Le and Suruga (2005), which analyzed a sample of 105 countries for the period 1970–2001 and found that excessive public expenditure might have a negative impact on FDI inflow.

The main contribution of this paper is therefore to highlight the role of the government's reputation in attracting FDI. On the one hand, our findings have a normative aspect by suggesting that conservative policies may signal a foreign-capital-friendly government and thus increase the foreign investor's confidence. This makes the inward FDI stock increase, which makes the capital stock increase as well, and consequently promotes economic growth. On the other hand, our results explain why some politicians who are considered populist adopt conservative policies in the beginning of their terms of office, and engage in expansionary ones as the end of their terms approach. In this regard, we offer an alternative explanation for political business cycle in developing countries. In fact, our results may be seen as complementary to those surveyed by Alesina et al. (1997).

1.1. Related literature

Given that we use economic policy as a signal of government's "quality", our model is close to the approach suggested by Niepelt and Dellas (2014), which discusses the function, properties and optimal size of austerity – defined as the shortfall of consumption from the level desired by a country and supported by its repayment capacity – using the standard sovereign debt model augmented to include incomplete information about credit risk.

The study we develop is also related to the literature that considers the government's debt choices as signals of solvency and fiscal responsibility of the policymaker. In such models, financial markets, instead of the foreign investor, do not know the type of policymaker in place, but try to infer its type by looking at its financial choices. Some examples of this approach are provided by Acharya and Diwan (1993) and Fernández-Ruiz (2000). While the former develops a general signaling game, the latter uses a multi-period model of debt overhang to explain the shift in debt policy

implicit in the Brady Plan. Their findings suggest that repurchasing and debt reduction are more informative signals than rescheduling. In fact, [Acharya and Diwan \(1993\)](#) shows empirical evidence that creditors grant debt relief only to countries with buyback programs. When the country is credit constrained, an alternative is studied by [Marchesi and Thomas \(1999\)](#), which adds the possibility of undertaking an IMF programme in return for debt reduction and possibly an IMF loan, finding similar results.

In a sense, our model and those of the aforementioned literature may be considered complementary. Another paper in the field, [Aizenman and Fernández-Ruiz \(2006\)](#), explicitly shows such a complementarity. This study develops a model in which a government (dubbed tough), using debt and reserves to smooth tax collection costs – measured by the deadweight loss – has to be cautious about not being mistaken for one seeking to maximize current resources (the soft one). It is assumed that the differential discount factors of the two policymakers have repercussions for future output, but the mechanism behind this effect is not explained. In fact, the reason why the soft policymaker will not undertake reforms or investment to the extent that the tough one will lies only in their different patience degrees.

The game proposed here explains the effect on the future output cited in [Aizenman and Fernández-Ruiz \(2006\)](#) through the FDI inflow. Despite the many possible channels, the Latin American context in which these models are developed shows that foreign capital is an important determinant of economic growth, as we have seen. Thus, the tough policymaker makes choices that encourage foreign investment, increasing the domestic capital stock and thus raising the future output. On the other hand, the soft one implements populist policies, such that the foreign investor does not invest and the output does not increase. Therefore, a possibility is to combine our approach with the literature of debt signals in order to build a model that incorporates FDI and credit attraction. We comment more on this subject in Section 3.

Finally, our findings are very similar to those of [Thomas and Worrall \(1994\)](#), which analyzes the dynamics of FDI stock in a country that presents risk of expropriation. In their model, the reason why the investment may be expropriated is that international contracts are practically impossible to enforce. The authors conclude that, provided there are always mutually advantageous trades to be made in the future, self-enforcing agreements may exist. Thus, like in our model, the host country faces a trade-off between short-term and long-term incentives: either expropriate or foster good relationship with the investor to attract more investment in the future. Unlike our results, however, [Thomas and Worrall \(1994\)](#) found that investment is initially under-provided but it increases over time. Therefore, we focus more on the uncertainty about the government's type, while the aforementioned work incorporates uncertainty through shocks in the output, but we both capture the reputation effects on FDI stock over time.

1.2. Outline

The rest of this paper is structured as follows. Section 2 presents the signaling game. Some limitations and a further potential extension of our model are discussed in Section 3. Finally, [Appendix A](#) brings the proofs omitted throughout text.

2. A model of FDI attraction

This section builds a simple signaling model based on the framework proposed by [Backus and Driffill \(1985\)](#) and [Barro \(1986\)](#). Throughout it, we assume the exchange rate is constant (or fixed). Thus, the government's decision cannot affect it and the investor's payoff does not depend on it.

2.1. Environment

The economy lasts for two periods, $t = 1, 2$. There is no population growth, such that population size is constant over time. We also assume that the labor force at period t , L_t , is inelastically supplied. The income of period t is given by the production function $Y_t = F(K_t, L_t) = K_t^\alpha L_t^{1-\alpha}$, with $0 < \alpha < 1$, where K_t is the capital stock. As the production function features constant returns to scale, the income per worker is given by $y_t = Y_t/L_t = k_t^\alpha$.

Wage in period t equals to marginal productivity of labor,

$$w_t = \frac{\partial Y_t}{\partial L_t} = (1 - \alpha)k_t^\alpha, \quad (2.1)$$

as well as the return of capital equals to its marginal productivity,

$$r_t = \frac{\partial Y_t}{\partial K_t} = \alpha k_t^{\alpha-1}. \quad (2.2)$$

We assume that the economy starts with a capital stock $k_1 > 0$, but there does not exist any domestic source of investment. In other words, the only channel through which the capital stock at period 2 can increase is inward FDI. Let I be the total of FDI stock, then $k_2 = k_1 + I$. Observe that this assumption implies that wages in the future will be higher only in the presence of positive FDI. Moreover, for the sake of simplicity we assume that the depreciation rate is zero.

Given the scarcity of capital described above, the demand for FDI is assumed to be inelastic. This implies that the price of investment is determined only by the supply side. In fact, under those circumstances, the risk premium demanded by the investor is the only determinant of the price.

2.2. Description of the participants

There are three different types of agents in our model, namely consumers, the government and a representative foreign investor. However, only the government is an actual player, that is, an agent whose decisions are made strategically and affect the welfare of the other agents. We describe them below.

2.2.1. Consumers

The consumer's instantaneous utility is given by

$$u_t = \frac{c_t^{1-\theta}}{1-\theta} + \phi \frac{g_t^{1-\gamma}}{1-\gamma}, \quad \phi, \theta, \gamma > 0 \quad \text{and} \quad \theta, \gamma \neq 1.$$

where c_t is the consumption per worker, g_t is the public expenditure per worker, θ and γ are parameters that measure the risk aversion of consumption and public expenditure, respectively, and ϕ is a constant that measures the weight given by the consumer to public expenditure relative to consumption.

Observe that we are assuming all government expenditure is directed to consumption, and thus it has no effect on the product through public investment. In fact, this implies that all investment is private – and foreign. One can think of g_t as public goods and services that yield direct impact on the consumer's utility and cannot be provided by the private sector.

The consumer's budget constraint is $c_t \leq w_t - \tau_t$, where τ_t denotes tax and w_t is the wage, defined by (2.1). We assume that there does not exist a capital market in the economy, such that the consumer cannot anticipate its income from period 2 or save part of its income of period 1 to future consumption. In addition, given that the marginal utility of consumption is positive, the consumer's budget constraint is satisfied with equality in each period.

2.2.2. Government

The government's utility represents the consumer's preferences, such that it solves

$$\max_{g_1, g_2} U(g_1, g_2) = \sum_{t=1}^2 \beta^{t-1} \left(\frac{c_t^{1-\theta}}{1-\theta} + d\phi \frac{g_t^{1-\theta}}{1-\theta} \right) \quad (2.3)$$

$$\text{subject to } c_t = w_t - \tau_t \quad (2.4)$$

$$g_t = \tau_t \quad \text{for } t = 1, 2 \quad (2.5)$$

$$g_t \geq 0 \quad (2.6)$$

where $\beta \in (0, 1)$ is the discount factor and measures the government's impatience, and d is an indicator variable of the government's type. For the sake of simplicity, we only consider the case of $\theta = \gamma$.¹

The assumption that the government's budget is balanced in each period, made in the constraint (2.5), highlights that the only variable that affects foreign investor's choice is public spending – such that we rule out the possibility of the government spending excessively in the present and thus having to pay its debt in the future by raising taxes. Similarly, government is not able to anticipate its future tax revenues in order to increase the present consumption. This assumption may be thought of as if the Ricardian equivalence were satisfied.

The government can be one of two types, either populist or conservative. If $d=1$, we have the populist type (henceforth denoted by “type 1”). We choose to call this type 1 populist because it adopts active fiscal policy in order to affect consumer's utility directly. If $d=0$ we have the another type of government (henceforth “type 2”), which it will always choose $g_t=0$. This one behaves in more conservative way by adopting fiscal austerity.

Given that the government's decisions determine the FDI inflow, the inelastic demand for foreign capital can be seen as if it were centralized. This implies that the government does not need to worry about the price of the investment before making its choices. Furthermore, as our model has only two periods, it does not consider the case in which the investor's return is not paid and then in the next periods the government has to decide whether or not to pay the foreign debt.

2.2.3. Foreign direct investor

There is a risk-neutral representative foreign direct investor, who owns plenty of capital and is investing in a perfect competition environment. The foreign investment supply is positively related to its expected return. Thus, whenever the foreign investor believes that there is a risk of not receiving his return, then he demands a risk premium. As we argued in the introduction, it is assumed that the foreign investor believes that a populist will eventually increase taxes or even expropriate his investment, such that in this cases his expected return is zero. If he believes the government is conservative, then the return rate is given by (2.2).

His initial belief is updated after he observes the government's signal g_1 . If government chooses $g_1 > 0$, then he is sure that it is the type 1. However, if $g_1 = 0$ government may be either the type 2 or the type 1 mimicking the behavior of type 2. Let p be the probability of the government being type 1. The foreign investor ascribes probability q to the type 1 government choosing $g_1 = 0$, such that the joint probability of the government being type 1 and choosing $g_1 = 0$ is given by $\text{Prob}(g_1 = 0 \cap \text{type}1) = pq$. The total FDI inflow is weighted by his belief, which follows Bayes' rule, namely

$$\text{Prob}(\text{type}2|g_1 = 0) = \frac{1 - p}{1 - p + pq}. \quad (2.7)$$

One can show that, given the demand for investment I , the investor demands $pq/(1 - p)$ as risk premium, which implies that the price that makes the demand be met, that is, the discount that the investor demands, is given by (2.7). Let \bar{I} be the amount of FDI he would invest if there is no discount – in our model, when he is sure that the government is conservative –, then the total investment under incomplete information is $I = \bar{I}(1 - p)/(1 - p + pq)$.

2.3. Timing of actions

The timing of the game can be summarized below:

1. Nature assigns probabilities of the government being type 1 and type 2.
2. Each government's type chooses the level of expenditure per worker at period $t=1$, g_1 .
3. The foreign investor observes the government's choice at period $t=1$, updates his belief and then invests at the beginning of period $t=2$.
4. Each government's type observes the amount invested I and plays again by choosing g_2 .
5. Payoffs are realized.

¹ When $\theta \neq \gamma$ we no longer have a closed solution for the government problem.

2.4. Solving the game

2.4.1. Complete information and the first best

Let us start with the populist’s problem. Given the complete information assumption, the foreign investor knows the government’s type, such that in this case $I=0$, which implies $k_2=k_1$ and $w_1 = w_2$. Thus, the type 1 government knows that there will not be FDI inflow, and at each period t maximizes

$$\max_{g_t} u_t = \frac{c_t^{1-\theta}}{1-\theta} + \phi \frac{g_t^{1-\theta}}{1-\theta} \tag{2.8}$$

$$\text{subject to } c_t = w_t - \tau_t. \tag{2.9}$$

By assuming that the government budget is balanced in both stages, we can substitute $\tau_t = g_t$ to obtain the budget constraint in terms of the expenditure $c_t = w_t - g_t$. Therefore, the first-order condition for g_t is

$$-(w_t - g_t)^{-\theta} + \phi g_t^{-\theta} = 0,$$

which yields for $t=1, 2$

$$g_t = \frac{w_t}{1 + \phi^{-\frac{1}{\theta}}} = \frac{\phi^{\frac{1}{\theta}}}{1 + \phi^{\frac{1}{\theta}}} w_t. \tag{2.10}$$

We can rewrite the utility as a function only of the wages, namely

$$U_{g_t > 0} = U \left(\frac{\phi^{\frac{1}{\theta}}}{1 + \phi^{\frac{1}{\theta}}} w_1, \frac{\phi^{\frac{1}{\theta}}}{1 + \phi^{\frac{1}{\theta}}} w_1 \right) = (1 + \beta) \frac{\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta}{1 - \theta} w_1^{1-\theta}. \tag{2.11}$$

The problem of the type 2 government is quite simple, given that when $d=0$ its optimization problem has the corner solution $g_t=0$ for $t=1, 2$. This yields the following total utility $U(0, 0) = \frac{w_1^{1-\theta}}{1-\theta} + \beta \frac{w_2^{1-\theta}}{1-\theta}$. Observe that now $k_2 = k_1 + \bar{I}$, such that $w_2 > w_1$.

In order to make some welfare analysis, it is also important to compute the government’s payoff in the hypothetical situation in which the government is able to choose a positive public spending in the first period and nevertheless the foreign investor chooses to invest \bar{I} without any discount in the second one. Let us call this allocation first best. Observe that in this case we have g_t given by (2.10) for $t=1, 2$, but $w_1 < w_2$ because of the FDI inflow. Thus, we have

$$U_{FB} = U \left(\frac{\phi^{\frac{1}{\theta}}}{1 + \phi^{\frac{1}{\theta}}} w_1, \frac{\phi^{\frac{1}{\theta}}}{1 + \phi^{\frac{1}{\theta}}} w_2 \right) = \frac{\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta}{1 - \theta} \left(w_1^{1-\theta} + \beta w_2^{1-\theta} \right). \tag{2.12}$$

It is straightforward to see that $U_{FB} > U_{g_t > 0}$ and $U_{FB} > U(0, 0)$.

2.4.2. Incomplete information

Suppose now that the government’s type is private information. We must solve the game through backward induction, thus we start by finding the type 1 government’s best response. At period 2, type 1 government has no incentive to mimic the behavior of type 2, because it is the last one, thus it takes I as given and solves (2.8) subject to (2.9) and $\tau_2 = g_2$. Thus, g_2 is given by (2.10). By substituting (2.10) into (2.8), we can rewrite the utility at the second period as a function only of the wage at same period, namely

$$u_2 = \frac{\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta}{1 - \theta} w_2^{1-\theta}.$$

Given that in this case $d=1$, in the first period, the type 1 government once again solves the optimization problem given by (2.8) and (2.9) and $\tau_1 = g_1$, which yields $g_1 = \frac{\phi^{\frac{1}{\theta}}}{1 + \phi^{\frac{1}{\theta}}} w_1$. Observe that the foreign investor can observe such a choice and be sure that the government is type 1, such that he defines $I=0$. Given that the total FDI is null, $k_2 = k_1$,

which implies $w_2 = w_1$. Therefore, the total utility when the populist government chooses positive expenditure in both periods is the same of the complete information case, namely it is given by (2.11).

The type 1 government can also choose the strategy of mimicking the behavior of the type 2 at the first period, such that $g_1 = 0$. As we have seen, there is no incentive to do so at period 2, such that g_2 is given by (2.10). Thus, the total utility of this second strategy is

$$U_{g_1=0} = U\left(0, \frac{\phi^{\frac{1}{\theta}}}{1 + \phi^{\frac{1}{\theta}}} w_2\right) = \frac{w_1^{1-\theta}}{1-\theta} + \beta \frac{\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta}{1-\theta} w_2^{1-\theta}.$$

Again, it is straightforward to see that $U_{FB} > U_{g_1=0}$.

Recall that the capital stock at the second period is equal to the capital stock in the first one plus the expected investment, $k_2 = k_1 + \left(\frac{1-p}{1-p+pq}\right) \bar{I}$. This means that the wage at the second period can be described as a function of \bar{I} , and the probabilities q and p , namely

$$w_2(\bar{I}, q, p) = (1-\alpha) \left[k_1 + \frac{1-p}{1-p+pq} \bar{I} \right]^\alpha. \quad (2.13)$$

Finally, the problem of the type 2 government is the same as it is in the case of complete information, such that $U(0, 0) = \frac{w_1^{1-\theta}}{1-\theta} + \beta \frac{w_2^{1-\theta}}{1-\theta}$.

2.5. Analysis and comparative statics

We are primarily interested in studying conditions that make the type 1 government decide to mimic the type 2 and then attract FDI to its country. This occurs whenever $U_{g_1=0} \geq U_{g_1>0}$:

$$\begin{aligned} \frac{w_1^{1-\theta}}{1-\theta} + \beta \left(1 + \phi^{\frac{1}{\theta}}\right)^\theta \frac{w_2^{1-\theta}}{1-\theta} &\geq (1+\beta) \left(1 + \phi^{\frac{1}{\theta}}\right)^\theta \frac{w_1^{1-\theta}}{1-\theta} \\ \frac{w_1^{1-\theta}}{1-\theta} \left[1 - \left(1 + \phi^{\frac{1}{\theta}}\right)^\theta\right] + \frac{\beta \left(1 + \phi^{\frac{1}{\theta}}\right)^\theta}{1-\theta} \left(w_2^{1-\theta} - w_1^{1-\theta}\right) &\geq 0. \end{aligned} \quad (2.14)$$

Observe that the first term in Eq. (2.14) is negative, because $\phi^{\frac{1}{\theta}} > 0$. Therefore, a necessary condition for the type 1 pretending to be the type 2 is not just the wage in the second period be higher than in the first. In fact, $\bar{I} > 0$ is sufficient for $w_2 > w_1$, such that any positive FDI would make the type 1 government choose $g_1 = 0$. Instead, it is necessary that w_2 be sufficiently higher than w_1 in order to overcome the value of the first term.

One can also note in (2.14) that the negative sign of the first term is due to the relative weight of public expenditure in the consumer's utility, ϕ . The higher ϕ , the lower $1 - \left(1 + \phi^{\frac{1}{\theta}}\right)^\theta$. Thus, the more weight the consumer gives to public expenditure relative to consumption, the higher the wage in period 2 should be relative to the wage in the previous period in order to the type 1 government mimic the type 2's behavior. For example, in the limit, with $\phi = 0$, the term is equal to zero, such that $w_2 > w_1$ suffices to the type 1 chooses $g_1 = 0$. Indeed, whenever public expenditure does not affect the consumer's utility, there is no room for government action through fiscal policy. Therefore, in this case, any positive FDI gives incentive to the type 1 behaves like the other one.

By substituting (2.1) for $t=1$ and (2.13) into (2.14) we have

$$(1 - \alpha)^{1-\theta} k_1^{\alpha(1-\theta)} \left[1 - \left(1 + \phi^{\frac{1}{\theta}} \right)^\theta \right] + \beta(1 - \alpha)^{1-\theta} \left(1 + \phi^{\frac{1}{\theta}} \right)^\theta \left\{ \left[k_1 + \frac{1-p}{1-p+pq} \bar{I} \right]^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)} \right\} \geq 0, \tag{2.15}$$

Now, by writing the expression above as a function of β , we have a line $f(\beta) = A + B\beta$, where $A = k_1^{\alpha(1-\theta)} \left[1 - \left(1 + \phi^{\frac{1}{\theta}} \right)^\theta \right]$ and $B = \left(1 + \phi^{\frac{1}{\theta}} \right)^\theta \left\{ \left[k_1 + \frac{1-p}{1-p+pq} \bar{I} \right]^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)} \right\}$. This line is clearly upward sloping, given that $\bar{I} > 0$ and $p, q \in [0, 1]$. This means that the more patient the government is (higher β), the higher $U_{g_1=0} - U_{g_1>0}$ is. In other words, more patient governments are more prone to chose $g_1 = 0$. We are interested in finding values of β that make $U_{g_1=0} \geq U_{g_1>0}$. This happens whenever $\beta > -\frac{A}{B}$:

$$\beta > \frac{k_1^{\alpha(1-\theta)} \left[\left(1 + \phi^{\frac{1}{\theta}} \right)^\theta - 1 \right]}{\left(1 + \phi^{\frac{1}{\theta}} \right)^\theta \left\{ \left[k_1 + \frac{1-p}{1-p+pq} \bar{I} \right]^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)} \right\}}, \tag{2.16}$$

where the right-hand size is positive, given our assumptions.

Let us define $\beta_{MIN} = -\frac{A}{B}$, such that we are able to perform comparative statics analysis. First, observe that $\frac{\partial \beta_{MIN}}{\partial \bar{I}} < 0$, such that the higher the planned FDI, the less patient must be the type 1 government in order to pretend to be the type 2. In fact, given that $\lim_{\bar{I} \rightarrow \infty} \beta_{MIN} = 0$, even the most impatient type 1 government chooses $g_1 = 0$ when FDI increases infinitely. This result is quite intuitive, given that the opportunity cost that the type 1 government faces when it decides $g_1 > 0$ is the foreign investment.

Probabilities also have an important role in determining β_{MIN} . Given that they affect the total FDI, they affect $U_{g_1=0}$ as well. For instance, the higher the foreign investor’s belief that type 1 government chooses $g_1 = 0$, the lower the total he invests in the country. So, the wage at the second period is lower, such that the populist government must be more patient in order for the payoff yielded by mimicking the behavior of the conservative government to be high enough.

Changes in p have similar impacts on β_{MIN} . We can see this by considering the limit cases: when $p = 1$ (foreign investor is sure that government is populist), $I = 0$ and thus there is no β that makes type 1 government pretend to be the another type; when $p = 0$ (foreign investor is sure that government is conservative), $I = \bar{I}$, such that β_{MIN} achieves its minimum.

Proposition 2.1. *Let the minimum degree of patience that makes the type 1 government choose to mimic the behavior of type 2, β_{MIN} , be given by the right-hand size of (2.16). Then, we have: (i) $\frac{\partial \beta_{MIN}}{\partial \bar{I}} < 0$, (ii) $\frac{\partial \beta_{MIN}}{\partial k_1} > 0$, (iii) $\frac{\partial \beta_{MIN}}{\partial \phi} > 0$, (iv) $\frac{\partial \beta_{MIN}}{\partial p} > 0$, and (v) $\frac{\partial \beta_{MIN}}{\partial q} > 0$.*

We can also define the minimum level of investment required for the type 1 government to mimic the type 2’s behavior by solving (2.15) for \bar{I} :

$$\bar{I} \geq \left[\frac{1-p+pq}{1-p} \right] k_1 \left\{ \left[\frac{\left(1 + \phi^{\frac{1}{\theta}} \right)^\theta (1 + \beta) - 1}{\left(1 + \phi^{\frac{1}{\theta}} \right)^\theta \beta} \right]^{\frac{1}{\alpha(1-\theta)}} - 1 \right\} = \bar{I}_{MIN} \tag{2.17}$$

One can see above that there exists a strong interaction between k_1 and \bar{I} . As we have already seen, the type 1 government faces an intertemporal trade-off and considers these two variables as “substitutes”. The higher the country’s initial capital stock, the higher the wage in the first period. This has two effects on the condition (2.14). First, it makes the first term more negative, which requires a higher value of the second in order to overcome it. In addition, it also decreases the second term of the expression. The reason is that the incremental increase in w_1 is higher than one

in w_2 , because the diminishing marginal return of wages. Therefore, \bar{I} must be higher in order to increase the wage in the second period and then to make it sufficiently higher than w_1 .

Proposition 2.2. *Let the minimum level of FDI required for the type 1 government choose to mimic the behavior of type 2, \bar{I}_{MIN} , be given by (2.17). Then, we have: (i) $\frac{\partial \bar{I}_{MIN}}{\partial \beta} < 0$, (ii) $\frac{\partial \bar{I}_{MIN}}{\partial k_1} > 0$, (iii) $\frac{\partial \bar{I}_{MIN}}{\partial \phi} > 0$, (iv) $\frac{\partial \bar{I}_{MIN}}{\partial p} > 0$, and (v) $\frac{\partial \bar{I}_{MIN}}{\partial q} > 0$.*

2.6. Equilibria

Let us now find the Perfect Bayesian equilibria (PBE) of the signaling game above. Three PBE are possible.

2.6.1. Separating equilibrium

The *separating equilibrium* occurs whenever $U_{g_1=0|q=0} < U_{g_1>0}$. This states that, even if the investor is sure that the type 1 government never chooses $g_1 = 0$ – its initial belief is $q = 0$ –, the populist government reveals its true type by choosing $g_1 > 0$. In other words, although it has incentive to mimic the behavior of type 2, because foreign investor would invest the maximum amount $I = \bar{I}$, the type 1 government's cost is higher than this potential benefit.

By substituting $q = 0$ into (2.16) and changing its inequality, we have that the sufficient condition for the separating equilibrium is

$$\beta < \frac{\left[\left(1 + \phi^{\frac{1}{\theta}} \right)^{\theta} - 1 \right] k_1^{\alpha(1-\theta)}}{\left(1 + \phi^{\frac{1}{\theta}} \right)^{\theta} (k_1 + \bar{I})^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)}}. \quad (2.18)$$

Therefore, β must be sufficiently low, such that the type 1 government is impatient enough and decides not to wait the future welfare that would be yielded by the FDI inflow. Again, observe that as \bar{I} approaches 0, the right-hand side approaches infinity, such that even the most patient of the governments will choose a positive public expenditure at the first period.

Whenever the separating equilibrium holds it is possible to observe the so-called *fly to quality* strategy being adopted by the investors. Given that one can differentiate the populist government from the conservative one, investors will directed their capital to economies whose return will surely be paid. Thus, such an equilibrium helps to explain the low FDI inflows to emerging countries in periods in which governments adopt fiscally irresponsible policies.

2.6.2. Pooling equilibrium

In the second PBE, we have the *pooling equilibrium*, where $U_{g_1=0|q=1} > U_{g_1>0}$. In such a case, foreign investor's belief is that the type 1 government always chooses $g_1 = 0$, and therefore he assigns $q = 1$. Now, it is too costly for the populist government to reveal its true type (by choosing $g_1 > 0$), even though the investor believes that it always mimics the conservative's behavior.

By using (2.16) with $q = 1$, we have the following condition for the pooling equilibrium,

$$\beta > \frac{\left[\left(1 + \phi^{\frac{1}{\theta}} \right)^{\theta} - 1 \right] k_1^{\alpha(1-\theta)}}{\left(1 + \phi^{\frac{1}{\theta}} \right)^{\theta} [k_1 + 1 - p\bar{I}]^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)}}. \quad (2.19)$$

In other words, it is stated that in order to the type 1 government to mimic the choices of type 2, β must be greater than a given threshold, that is, the populist government must be patient enough to wait for the future benefits yielded by the foreign investment.

The possibility of existence of this equilibrium can explain situations where investors face similar risk premium in many different emerging economies, such that there is an abundance of capital directed to those countries. In fact, this will be the case whenever governments make choices that send similar signals to investors, like in the Euro area.²

² A paper which makes an exercise similar to ours is Araujo et al. (2016), however this study focuses on the relationship between foreign capital inflow and debt repayment.

Comparative statics can show that whenever p approaches 1, the threshold approaches infinity, that is, β would always be lower than it, such that even the most patient type 1 government would not choose $g_1 = 0$. Recall that p is common knowledge, which implies that the foreign investor knows that probability of the government being type 1 is increasing, and then his expected investment decreases to zero. In addition, one can see that whenever \bar{I} approaches infinity, the right-hand side approaches zero. Now, even the most impatient populist government waits for the future benefits of the FDI by choosing $g_1 = 0$.

2.6.3. *A third possible equilibrium*

Finally, the third PBE occurs whenever $U_{g_1=0|q=0} > U_{g_1>0} > U_{g_1>0|q=1}$. From (2.18) and (2.19), we have

$$\begin{aligned} & \frac{\left[\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta - 1 \right]}{\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta} \frac{k_1^{\alpha(1-\theta)}}{(k_1 + \bar{I})^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)}} > \beta \\ & > \frac{\left[\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta - 1 \right]}{\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta} \frac{k_1^{\alpha(1-\theta)}}{[k_1 + 1 - p\bar{I}]^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)}}. \end{aligned} \tag{2.20}$$

In this case, the type 1 government makes its choice against the investor’s belief. Thus, if the foreign investor believes that expenditure at period 1 will be zero, the government chooses $g_1 = \frac{\phi^{\frac{1}{\theta}}}{1+\phi^{\frac{1}{\theta}}} w_1$, and vice versa. In this equilibrium his belief q adjusts to the point in which the government is indifferent towards $g_1 = 0$ and $g_1 > 0$.

By solving (2.16) for q with equality, we have

$$q = \frac{1-p}{p} \left(\frac{\bar{I}}{k_1} \left\{ \left[\frac{\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta (1 + \beta) - 1}{\left(1 + \phi^{\frac{1}{\theta}}\right)^\theta \beta} \right]^{\frac{1}{\alpha(1-\theta)}} - 1 \right\}^{-1} - 1 \right). \tag{2.21}$$

Given that (2.21) makes the populist government indifferent between its two possible choices, changes in the parameters and variables affect its payoffs and thus q must adjust in order to maintain the equality. For instance, an increase in \bar{I} makes the strategy $g_1 = 0$ more attractive relative to $g_1 > 0$. Therefore, q must increase as well, such that it offsets the increase in the total investment I yielded by the change in the initially planned FDI. Similarly, q must decrease when k_1 increases, because now the strategy $g_1 > 0$ is relatively more attractive, such that it is necessary to increase the other alternative’s payoff by increasing I . All these effects can be seen directly in (2.21) by calculating the derivatives of q .

The three PBE found in this section are summarized in the next proposition.

Proposition 2.3. *Consider the FDI attraction game described above. Then, the following are Perfect Bayesian Equilibria of the game: (i) a separating equilibrium, where the populist government reveals its type by choosing $g_1 > 0$ and foreign investor’s belief is $q=0$, which happens whenever β satisfies (2.18); (ii) a pooling equilibrium, where both government’s types choose $g_1=0$ and the foreign investor’s belief is $q=1$, which happens whenever β satisfies (2.19); and (iii) an equilibrium where the populist government is indifferent between $g_1 = 0$ and $g_1 > 0$ and the foreign investor’s belief satisfies (2.21), whenever β satisfies (2.20).*

A final remark is that the possibility of existence of multiple equilibria and, in particular, of a self-confirmed equilibrium is ruled out. One can notice in the expressions (2.15) and (2.16) that the lower the investor’s belief – the

probability of type 1 choosing $g_1 = 0$ – the higher the incentive to mimic the conservative’s behavior. Therefore, as in the separating equilibrium we have $q = 0$, this incentive is maximum in this case.

2.7. Impacts of FDI on productivity

It is not difficult to modify the baseline model in order to incorporate the impacts of FDI on labor and capital productivity. FDI has a broad and diversified impact on growth, partly due to know-how and technology diffusion that this kind of investment brings. These effects impact the economy’s productivity, but they are not captured by our baseline model. In this section we show that the inclusion of those features does not change our main findings.

Consider the following production function $Y_t = F(K_t, L_t) = AK_t^\alpha L_t^{1-\alpha}$ with $0 < \alpha < 1$. Assume that A is a function of the FDI stock, $A = A(I)$, with $A' > 0$, $A'' < 0$ and $A(0) > 0$. Therefore, given that now $w_t = A(1 - \alpha)k_t^\alpha$, an increase in the FDI has two positive impacts on the wage at the second period. First, it increases the capital stock ($k_2 = k_1 + I > k_1$). Second, it also affects the productivity, by increasing the level of A ($A(0) < A(I)$). Thus, in a 2 period game with this new production function, the type 1 government’s strategy of mimicking the behavior of type 2 yields a payoff larger than in the baseline model, which is reflected in lower both β_{MIN} and \bar{I}_{MIN} .

A simple example illustrates the reasoning above. Assume that $A(I) = \sqrt{I} + 1$, such that it satisfies the aforementioned assumptions and $A(0) = 1$. Let \hat{w}_t be the wage at period t in this modified model. Thus, when the type 1 government chooses $g_1 > 0$ and then $I = 0$, the wage is $\hat{w}_2 = \hat{w}_1 = (1 - \alpha)k_1^\alpha$, that is, the same of the original model. However, now when it chooses $g_1 = 0$, $\hat{w}_1 = (1 - \alpha)k_1^\alpha$ and

$$\hat{w}_2 = (1 - \alpha) \left(1 + \sqrt{\frac{1-p}{1-p+pq} \bar{I}} \right) \left(k_1 + \frac{1-p}{1-p+pq} \bar{I} \right)^\alpha.$$

Observe that $A(I) = \left(1 + \sqrt{\frac{1-p}{1-p+pq} \bar{I}} \right) > 1$, such that $\hat{w}_2 > w_2$. This indicates that now the incentive to the type 1 government to mimic the behavior of type 2 is higher than in the baseline model.

Straightforward modifications in our previous calculations yield

$$\beta > \frac{k_1^{\alpha(1-\theta)} \left[\left(1 + \phi^{\frac{1}{\theta}} \right)^\theta - 1 \right]}{\left(1 + \phi^{\frac{1}{\theta}} \right)^\theta \left\{ \left(1 + \sqrt{\frac{1-p}{1-p+pq} \bar{I}} \right)^{1-\theta} \left(k_1 + \frac{1-p}{1-p+pq} \bar{I} \right)^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)} \right\}}.$$

The right-hand side is clearly lower than β_{MIN} (expression (2.16)). Moreover, we may perform the same modification and find a lower \bar{I}_{MIN} . The proposition below summarizes these findings for a generic function $A(I)$.

Proposition 2.4. *Consider our original model modified by the presence of the term $A(I)$ in the production function, such that $Y_t = F(K_t, L_t) = AK_t^\alpha L_t^{1-\alpha}$ with $0 < \alpha < 1$. Suppose that $A' > 0$, $A'' < 0$ and $A(0) > 0$. Then, both β_{MIN} and \bar{I}_{MIN} are lower in this modified model.*

In short, the conclusion of the modification suggested in this section is that there exists more incentive to choose $g_1 = 0$ than in the original game.

3. Concluding remarks

The government’s reputation of being conservative may attract FDI through mitigation of the foreign investor’s uncertainty. In our model the channel by which foreign capital promotes welfare improvement is the increase of domestic capital stock and thus the rise in wages. In the two period game, the reputation’s effect is unambiguous: the more conservative the implemented policy, the higher the stock of FDI and the higher the wages’ level.

Our findings provide a further explanation for political cycles. The literature on this subject argues that the proximity of election affects policy choices (Alesina et al., 1997). More specifically, policymakers often induce good economic conditions just before the election by increasing public spending and decreasing taxes. The idea is that voters recognize that their welfare improvement was due to the current policies and thus tend to reelect the politician in the office.

We show such a strategy may be enhanced through FDI attraction, specially in developing countries, which are more dependent on foreign resources. In fact, the spending in the end of the term may yield better result to the politician if accompanied by an increase in the FDI stock.

Some further extensions may be developed in future studies. The first one is to consider a model that also incorporates monetary policy. Monetary variables, such as inflation, exchange rate, foreign-exchange reserves, and interest rate of public bonds, affect country risk (Cantor and Packer, 1996; Kamin and Von Kleist, 1999; Min, 1998) and thus are also determinants of the FDI stock. Therefore, the government would send a multidimensional signal to foreign investors, containing variables associated to both fiscal and monetary aspects of the host country. This more complex model would allow us to study credit constraints faced by the government and how such signals affect them, in line with Aizenman and Fernández-Ruiz (2006), Acharya and Diwan (1993) and Fernández-Ruiz (2000). Finally, we may add the possibility of public investment financed by loans.

Another potential improvement in our model may be achieved by allowing different states of the world change the interpretation of a particular signal. For example, a large public expenditure may indicate that the government is fiscally irresponsible and thus it will raise taxes in the future. However, this same signal may also be sent when the current public savings are large, such that it allows the government to spend a positive amount in the present. The difference between these two interpretations lies in the previous balance sheet of each situation: while in the former there is a public deficit, in the latter there is surplus. We can consider each situation as a different state of the world. This approach resembles the framework adopted by Blanchard (2004) to study fiscal dominance, in which a high interest rate may be understood as a signal of either government's concern about inflation or need of resources to finance the increasing public debt, depending on the country's current fiscal situation.

Finally, recall that because our model has only two period, it does not cover the future period when the return of the investor's capital is zero, for example when the populist government expropriates his investment, and thus there is default in the economy. Therefore, a third promising extension is to include more periods and thus to be able to analyze the possibility of debt repayment, decision which would be made also by the government. In this case, the model would resemble the one of Cole and Kehoe (1996), and the problem would be to allocate the tax revenue in public spending and debt repayment, such that we could study how such an allocation affects the FDI inflow and the future consumer's welfare.

Appendix A. Omitted proofs

A.1. Proposition 2.1

Let us start by proving item (i):

$$\frac{\partial \beta_{MIN}}{\partial I} = -\alpha(1-\theta) \left(\frac{1-p}{1-p+pq} \right) k_1^{\alpha(1-\theta)} \frac{\left[(1+\phi^{\frac{1}{\theta}})^{\theta} - 1 \right]}{(1+\phi^{\frac{1}{\theta}})^{\theta}} \cdot \frac{\left[k_1 + \frac{1-p}{1-p+pq} I \right]^{\alpha(1-\theta)-1}}{\left\{ \left[k_1 + \frac{1-p}{1-p+pq} I \right]^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)} \right\}^2} < 0,$$

because $\phi > 0$ implies $(1 + \phi^{\frac{1}{\theta}})^{\theta} > 1$.

For item (ii), note that $k_1 < k_1 + \frac{1-p}{1-p+pq}\bar{I}$ implies $k_1^{-1} - \left[k_1 + \frac{1-p}{1-p+pq}\bar{I}\right]^{-1} > 0$, such that

$$\frac{\partial \beta_{MIN}}{\partial k_1} = \alpha(1-\theta)k_1^{\alpha(1-\theta)} \left[k_1 + \frac{1-p}{1-p+pq}\bar{I}\right]^{\alpha(1-\theta)} \frac{\left[(1+\phi^{\frac{1}{\theta}})^{\theta} - 1\right]}{(1+\phi^{\frac{1}{\theta}})^{\theta}} \cdot \frac{\left\{k_1^{-1} - \left[k_1 + \frac{1-p}{1-p+pq}\bar{I}\right]^{-1}\right\}}{\left\{\left[k_1 + \frac{1-p}{1-p+pq}\bar{I}\right]^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)}\right\}^2} > 0.$$

The remaining items of the proposition are shown below.

$$\frac{\beta_{MIN}}{\partial \phi} = \frac{k_1^{\alpha(1-\theta)}}{\left\{\left[k_1 + \frac{1-p}{1-p+pq}\bar{I}\right]^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)}\right\}} \frac{\phi^{\frac{1-\theta}{\theta}}}{(1+\phi^{\frac{1}{\theta}})^{1+\theta}} > 0$$

$$\frac{\beta_{MIN}}{\partial p} = \alpha(1-\theta)qk_1^{\alpha(1-\theta)} \frac{\left[(1+\phi^{\frac{1}{\theta}})^{\theta} - 1\right]}{(1+\phi^{\frac{1}{\theta}})^{\theta}} \frac{\left[k_1 + \frac{1-p}{1-p+pq}\bar{I}\right]^{\alpha(1-\theta)-1}}{(1-p+pq)^2} \bar{I} > 0$$

$$\frac{\beta_{MIN}}{\partial q} = \alpha(1-\theta)(1-p)pk_1^{\alpha(1-\theta)} \frac{\left[(1+\phi^{\frac{1}{\theta}})^{\theta} - 1\right]}{(1+\phi^{\frac{1}{\theta}})^{\theta}} \frac{\left[k_1 + \frac{1-p}{1-p+pq}\bar{I}\right]^{\alpha(1-\theta)-1}}{(1-p+pq)^2} \bar{I} > 0$$

Once again, observe that they hold because $(1+\phi^{\frac{1}{\theta}})^{\theta} - 1 > 0$. ■

A.2. Proposition 2.2

We can demonstrate item (i) by taking the following derivative

$$\frac{\partial \bar{I}_{MIN}}{\partial \beta} = \left(\frac{1-p+pq}{1-p}\right) \frac{k_1 \left(1+\phi^{\frac{1}{\theta}}\right)^{\theta} \left[1 - \left(1+\phi^{\frac{1}{\theta}}\right)^{\theta}\right]}{\alpha(1-\theta) \left[\left(1+\phi^{\frac{1}{\theta}}\right)^{\theta} \beta\right]^2} \cdot \left[\frac{\left(1+\phi^{\frac{1}{\theta}}\right)^{\theta} (1+\beta) - 1}{\left(1+\phi^{\frac{1}{\theta}}\right)^{\theta} \beta}\right]^{\frac{1}{\alpha(1-\theta)} - 1} < 0,$$

which holds because $(1 + \phi^{\frac{1}{\theta}})^{\theta} (1 + \beta) - 1 = \left[(1 + \phi^{\frac{1}{\theta}})^{\theta} - 1 \right] + \beta (1 + \phi^{\frac{1}{\theta}})^{\theta} > 0$.

We can also show that

$$\frac{\partial \bar{I}_{MIN}}{\partial k_1} = \left[\frac{1-p+pq}{1-p} \right] \left\{ \left[\frac{(1 + \phi^{\frac{1}{\theta}})^{\theta} (1 + \beta) - 1}{(1 + \phi^{\frac{1}{\theta}})^{\theta} \beta} \right]^{\frac{1}{\alpha(1-\theta)}} - 1 \right\} > 0,$$

because $\left[\frac{(1 + \phi^{\frac{1}{\theta}})^{\theta} (1 + \beta) - 1}{(1 + \phi^{\frac{1}{\theta}})^{\theta} \beta} \right]^{\frac{1}{\alpha(1-\theta)}} > 1$, given that $\alpha(1 - \theta) < 1$ implies $\frac{1}{\alpha(1-\theta)} > 1$. This proves item (ii).

Items (iii), (iv) and (v) are demonstrated below:

$$\frac{\partial \bar{I}_{MIN}}{\partial \phi} = \left(\frac{1-p+pq}{1-p} \right) \frac{k_1 (1 + \phi^{\frac{1}{\theta}})^{\theta-1} \phi^{\frac{1-\theta}{\theta}} \beta}{\alpha(1-\theta) \left[(1 + \phi^{\frac{1}{\theta}})^{\theta} \beta \right]^2} \left[\frac{(1 + \phi^{\frac{1}{\theta}})^{\theta} (1 + \beta) - 1}{(1 + \phi^{\frac{1}{\theta}})^{\theta} \beta} \right]^{\frac{1}{\alpha(1-\theta)} - 1} > 0$$

$$\frac{\partial \bar{I}_{MIN}}{\partial p} = \frac{k_1 q}{(1-p)^2} \left\{ \left[\frac{(1 + \phi^{\frac{1}{\theta}})^{\theta} (1 + \beta) - 1}{(1 + \phi^{\frac{1}{\theta}})^{\theta} \beta} \right]^{\frac{1}{\alpha(1-\theta)}} - 1 \right\} > 0$$

$$\frac{\partial \bar{I}_{MIN}}{\partial q} = \frac{k_1 p}{1-p} \left\{ \left[\frac{(1 + \phi^{\frac{1}{\theta}})^{\theta} (1 + \beta) - 1}{(1 + \phi^{\frac{1}{\theta}})^{\theta} \beta} \right]^{\frac{1}{\alpha(1-\theta)}} - 1 \right\} > 0,$$

where we use the two fact mentioned in the proof of items (i) and (ii). ■

A.3. Proposition 2.4

Given that $A' > 0$, we have $A(I_2) > A(0) > 0$. Moreover, $w_2^* = A(I_2)(1 - \alpha)k_2^{\alpha} > A(0)(1 - \alpha)k_1^{\alpha} = w_1^*$. Without loss of generality assume $A(0) = 1$. By using (2.14), we can write

$$\begin{aligned} \beta_{MIN} - \beta_{MIN}^* &= \frac{\left[(1 + \phi^{\frac{1}{\theta}})^{\theta} - 1 \right] w_1^{1-\theta}}{(1 + \phi^{\frac{1}{\theta}})^{\theta} (w_2^{1-\theta} - w_1^{1-\theta})} - \frac{\left[(1 + \phi^{\frac{1}{\theta}})^{\theta} - 1 \right] w_1^{*1-\theta}}{(1 + \phi^{\frac{1}{\theta}})^{\theta} (w_2^{*1-\theta} - w_1^{*1-\theta})} \\ &= \frac{\left[(1 + \phi^{\frac{1}{\theta}})^{\theta} - 1 \right]}{(1 + \phi^{\frac{1}{\theta}})^{\theta}} k_1^{1-\theta} \left[\frac{1}{k_2^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)}} - \frac{1}{A(I_2)^{1-\theta} k_2^{\alpha(1-\theta)} - k_1^{\alpha(1-\theta)}} \right] \\ &> 0. \end{aligned}$$

This states $\beta_{MIN} > \beta_{MIN}^*$.

Note that in this modified model the only change occurs at the second period wage, such that we can explicitly write it as a function of I_2 , $w_2^*(I_2) = A(I_2)(1 - \alpha)k_2^\alpha = A(I_2)w_2(I_2) > w_2(I_2)$. It is straightforward to show that the improvement in the type 1 government's welfare is given by

$$\frac{\beta \left(1 + \phi^{\frac{1}{\theta}}\right)^\theta}{1 - \theta} w_2(I_2)^{1-\theta} \left(A(I_2)^{1-\theta} - 1\right) > 0,$$

such that the same level of FDI (that is, \bar{I}) makes the populist government more prone to mimic the conservative one. Thus, by the continuity of the functions, one can show that for ϵ small enough, $w_2(I_2 - \epsilon)^{1-\theta} \left(A(I_2 - \epsilon)^{1-\theta} - 1\right) > 0$. This shows that, in a model that FDI impacts on productivity, even a lower level of \bar{I} makes the type 1 government choose $g_1 = 0$, that is, $\bar{I}_{MIN}^* < \bar{I}_{MIN}$. ■

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