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by

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Centre for Research in Economic Development and International Trade, University of Nottingham

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Abstract

Is the World Bank's Development Policy Lending likely to enhance ownership and have greater effectiveness than structural adjustment? We specify a dynamic common agency model in which a government committed to reform faces domestic opposition from interest groups. The dynamic specification, which is original in the context of policy reforms supported by the International Financial Institutions (IFIs), is essential to allow the strength of special interest groups to arise endogenously during the reform process. We show that conditionality could alter the country's political equilibrium and that the design of conditionality could have an impact on the effectiveness of conditionality by reducing domestic opposition to the reform programme. However, depending on country-specific circumstances, conditional assistance could lead to lower social welfare. Thus, for conditionality not to be inconsistent with ownership, its design must be appropriate to the country circumstances and directly affect the domestic political constraint. Unless the IFIs are prepared to design the content of conditionality according to recipient countries' special characteristics, conditionality is likely to remain inconsistent with ownership.

Outline

1. INTRODUCTION

In August 2004, after over two years of extensive consultations with country officials, NGOs, academics, and the general public, the World Bank formally announced the replacement of Structural Adjustment Lending with Development Policy Lending (DPL). This new lending facility represents an attempt to operationalize the principles of the Comprehensive Development Framework – an approach to development assistance launched by the Bank in 1999 with the aim of enhancing local ownership of the development process through greater stakeholder participation in the decision-making process (World Bank, 2004).

The promotion of ownership is a key objective of DPL. Ownership, which could be defined as the commitment by a recipient country to undertake reforms independently of the incentives provided by lenders, is a crucial element determining the outcome of reform programmes supported by the International Financial Institutions (IFIs). A host of empirical studies as well as in-country practical experience have shown that all too often the failure of reform programmes can be attributed to governments' unwillingness to implement the reforms which they had promised. To reflect the recognition of the importance of ownership, the new Operational Directives for the implementation of World Bank policies require that the decision to provide financial assistance to a country be based on an assessment by the Bank of the degree of programme ownership and of how this might affect reform sustainability.

Despite the fact that, in the absence of commitment to reform, conditionality has generally been an ineffective mechanism in bringing about policy change, conditionality remains a central feature of DPL. However two important changes in the nature of conditionality are envisaged. One, conditionality must be streamlined so that the conditions focus only on those reforms that are regarded as essential for achieving the programme objectives. Two, conditionality must no longer be ex-post (whereby loan disbursements are made following the promise of a policy change) but ex-ante (which requires that policy change be actually implemented before any disbursement is effected, thus proving the recipient government's commitment to reform).

Critics argue that conditionality and ownership are incompatible. If the country owned the reform programme, it would implement the reforms anyhow and conditionality would be

unnecessary. Thus, the very presence of conditionality signals a conflict of interests between lenders and recipients and undermines ownership. By contrast, the IFIs insist that conditionality and ownership can be complementary. This view is maintained in DPL, where conditionality is assigned the roles of specifying the crucial elements of the reform programme and helping the government signal its intentions.

But is this reconciliation of conditionality with ownership convincing? Is this view of conditionality likely to enhance ownership, making the new lending facility potentially more likely to have greater effectiveness than structural adjustment? We give a somewhat sceptical answer in the present circumstances. We structure our argument as follows. In the next section we briefly discuss the principle of selectivity, according to which policy lending should be exclusively directed to countries that are likely to be committed reformers. Although greater selectivity may be justified in some case, we suggest that, so long as this principle continues to underpin the character of the assistance provided by the IFIs – as in DPL – no true reconciliation between conditionality and ownership is possible. While selectivity precludes a fundamental reappraisal of the reform policies supported by the IFIs, it depends precisely on the quality of such policies, i.e. on the content of conditionality, whether conditionality and ownership can be reconciled.

The subsequent sections highlight the role of the design of conditionality within a dynamic common agency model. This is a political economy model which explicitly takes into account the presence of interest groups opposed to reform. The dynamic specification of the common agency model in the context of the implementation of policy reforms supported by the IFIs is an original contribution to the literature. In our view such a dynamic specification is crucial, for it allows opposition to reform to change endogenously during the reform process. The model setup, its solutions and simulations are presented in sections 3-5 respectively, with conclusions and policy implications following in section 6.

2. SELECTIVITY AND OWNERSHIP

The intellectual foundation of the selectivity approach is the research on aid effectiveness. Started within the World Bank, this research programme culminated in the well-known World Bank (1998) report. Underpinning this report are two studies that have become very influential, namely, Burnside and Dollar (2000) and Dollar and Svensson (2000). Burnside and Dollar find that aid and policy lending have had a positive effect on the recipient countries' rates of economic growth only in 'good' policy environments, that is, where countries had budget surpluses, low inflation and trade openness. Dollar and Svensson find that the success of World Bank structural adjustment programmes can be explained by a small number of political economy variables within the reforming country. By contrast, factors that reflect the World Bank's efforts are irrelevant for the programmes' outcomes.[1]

These empirical findings have unambiguous implications for the role of donors and support the adoption of selectivity in policy-based lending. Since the success of reform programmes depends entirely on the country's authorities, the donors should take the probability that reforms will be carried through as given and should simply try and identify the likely reformers. These are the countries that should receive assistance. In these good policy environments, aid and policy lending will contribute to economic growth. This view embodies the belief that the reform programmes supported by the donor community are the right policies to set a country on a development course and lift it out of poverty, for the disappointing economic performance in programme countries is attributed to their governments' lack of commitment towards reform.

The selectivity approach also entails a major overhaul of the use of conditionality, since with ownership ex-post conditionality is unnecessary. Moreover, as selectivity is exercised by providing assistance to countries with a good policy environment, conditionality should then

become ex-ante, for the implementation of policy change in advance of financial assistance would be a demonstration of the recipient government's commitment to reform and ownership.

The formulation of DPL has been explicitly influenced by the research programme on the effectiveness of aid. The importance of reform ownership and quality of the policy environment for the success of reform programmes; the rejection of traditional ex-post conditionality and its replacement with the country's track record (ex-ante conditionality) as the basis for the allocation of policy-based loans are defining aspects of DPL, which forcefully emerge from that body of research.[2]

On the surface it may appear, however, that DPL rejects the view – implicit in selectivity – that the reforms that the World Bank advocates are good and do not need to be re-examined. World Bank (2004) states in fact that DPL reflects the recognition that there is no single blueprint for reform that will work in all countries and that policy programmes must be country specific and based on ownership. However, this statement sits rather uncomfortably together with Operational Directives which stipulate that the decision by the Bank to financially support a country's reform programme must be based on a positive evaluation of its macroeconomic, social, and structural policies, its governance, and its implementation capacity, taking into account the country's track record (which is regarded as one of the more robust indicators of commitment).

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1 An analysis of programmes supported by the International Monetary Fund reaches conclusions that are broadly similar to those in Dollar and Svensson (2000), see Ivanova *et al*. (2003). However, the results presented by Ivanova *et al.* find no support for the political economy variables that are important in Dollar and Svensson. More recently, Malesa and Silarszky (2004) dispute the Dollar and Svensson finding that the World Bank cannot positively affect the outcome of supported reform programmes. In their regressions, some of the variables under World Bank's control are indeed significant factors affecting programme success. In earlier work, though using a much smaller dataset, Mosley, Noorbakhsh and Paloni (2003) too suggested that the design of conditionality could have an effect on the implementation of conditions.

2 It may be argued, instead, that the principle of streamlining conditionality to a few key policy actions is not strongly founded on formal empirical studies. While the experience with adjustment lending teaches that streamlining is likely to be helpful to enhance ownership, the general evidence provided by econometric studies is ambiguous. Some research suggests the existence of an empirical inverse relationship between the number of conditions and programme success, but other research fails to find any significant relationship. For example, Dollar and Svensson (2000) find that the number of conditions is not related to programme success.

It seems therefore still to be the case that countries in need of access to the financial resources of DPL will continue to face strong pressures to accept – or to pretend to accept – the reforms that the World Bank considers necessary for development.[3] It is interesting to note that the paper that the World Bank is inviting comments on, as part of the consultations for the current process of review of its conditionality (due to end in June 2005), identifies as a key question how to reconcile the tensions between the objectives of country ownership and selectivity in the context of DPL (World Bank, 2005). Thus, we contend that the reconciliation of conditionality and ownership in DPL will remain somewhat fictitious without a real willingness on the part of IFIs to reconsider the appropriateness of the policies they support for the individual recipient countries.

In this paper we propose an alternative route for reconciling ownership with conditionality and suggest that it is through the attention to the design of conditionality that conditionality can be made consistent with ownership. Our argument is conducted within the realm of political economy, which in our opinion goes to the heart of the question of country ownership by considering the existence of political constraints facing the government. As our point of departure we take issue with the Burnside and Dollar finding that aid is effective only in good policy environments, in which the use of conditionality would be redundant. In our view, such characterization is too simple. In reality, policy environments and quality of institutions in the majority of developing countries cannot be easily categorized as either wholly good or wholly bad (Boughton and Mourmouras, 2002). In fact, within a recipient country, ownership of a reform programme is unlikely to be universal. For example, it is possible that, while the country's authorities are in favour of reform and 'own' the programme, their ownership does not coincide with ownership by the country as a whole, since they face domestic opposition.

A policy environment so described re-opens the debate on the merits of conditionality, since as suggested by Drazen (2002) ownership and conditionality may not be inconsistent if there is domestic heterogeneity of interests. More precisely, we address two questions: (a) Can conditionality reduce domestic opposition to the reform programme? (b) Does the design of

3 In practice this problem has already been noted with the Poverty Reduction Strategy Papers, which despite the emphasis on ownership present a high degree of similarity with the old structural adjustment programmes.

conditionality matter? In other words, can the design of conditionality have an impact on the effectiveness of conditionality?

3. MODEL

As our framework of analysis we employ the common agency model, originally developed by Bernheim and Whinston (1986) and later popularised by Grossman and Helpman (1994). In the basic setup, the government is the agent which sets some relevant policy tools while various pressure groups act as its principals. The principals attempt to influence the government's policy decision by offering political contributions to the agent.

The static common agency model was used by Mayer and Mourmouras (2002) to analyse the interactions between a government committed to reform (i.e., intent on reducing existing policy distortions), an IFI that is willing to provide financial support to the government, and interest groups opposing reform. These groups compete with the IFI to influence the recipient government towards setting a policy that is more favourable to them. Given the amount of lending offered by the IFI and political donations offered by the interest groups, the government – which also cares about social welfare – chooses whether to reduce the policy distortions and the extent of the reduction.

While Mayer and Mourmouras consider a dynamic version of the common agency model in a later paper (Mourmouras and Mayer, 2004), their world remains stationary, in the sense that every period is like the initial period and neither economic nor political conditions are expected to change from period to period. Our model goes further and specifies a fully dynamic common agency model for the analysis of the implementation of policy reforms supported by the IFI.

Such a dynamic extension is important because policy reform affects social welfare as well as the interest groups' incentives and actions over time. Thus, in reaching its decisions about the implementation of reform, the government takes into account both the evolution of social welfare and the behaviour of the interest groups. By implication, our dynamic approach allows for the strength of special interest groups opposing welfare-improving reform to be determined endogenously during the reform process, as in Olson (1982, 1993). Therefore, our paper suggests that the design of conditionality – in this paper, we consider the speed of reforms – could alter the political opposition to (or support for) the reform.

This is important, since a vision of the reform process where opposition is exogenously set – as is the case in the static setting of Mayer and Mourmouras (2002) – would lead one to advocate selectivity in policy-based lending. By contrast, when opposition arises endogenously from the reform process – as in our setting – the design of the reform programme and the quality of the policy advice are at least as important as the country's political economy characteristics in determining the outcome of reform programmes.

The specific setup of our model is as follows. The government is willing to liberalise trade and the IFI is willing to provide finance – conditional on the extent of reform implementation – to support the government's reform effort. Liberalisation, however, would expose relatively inefficient domestic firms to foreign competition. Therefore, lobbies of domestic producers exert pressure on the government for continued tariff protection. Thus, in each period t the government maximises an objective function that is a weighted average of social welfare (W), political contributions (C) from m interest groups and lending from the IFI (F)

$$(1) \quad G_t(t) = \sum_{j=1}^{m} C_{jt}(t) + F_t(t) + aW_t(t)$$

where t is a specific tariff on imports and it is the policy variable the government has to choose. Aggregate social welfare W is defined gross of contributions and it includes consumer surplus, domestic firms' profits and tariff revenue. The parameter a is the weight of social welfare in the government's objective function and is positive. Lending from the IFI is conditional on economic policies.[4] It is assumed that the IFI cares about social welfare in the recipient country and that, in this sense, the government and the IFI have a commonality of interests. In other words, the government 'owns' the reform programme. For this reason, the IFI can be seen as an additional principal that competes with the domestic interest groups to influence the setting of economic policy.[5] Therefore, the IFI and the domestic interest groups present the government with contribution schedules. The government chooses its optimal tariff and collects contributions and lending accordingly.

4 We abstract from the issue of repayment of the loan, essentially treating the loan as a grant.

5 In this setup the principal-agent framework is not necessarily inconsistent with the notion of ownership, as it is in IMF (2001)

The IFI provides financial assistance to the government. When deciding the amount of lending, the IFI has to balance two considerations. On the one hand, lending can improve social welfare in the country, which the IFI cares about, but, on the other, there is an opportunity cost to the institution in providing the funding. Thus, the objective function of the IFI in each period is

(2) $I_t(t) = bW_t(t) - F_t(t)$

where $b > 0$ measures how much the IFI cares about the recipient country.

The domestic industry is characterized by imperfect competition and protected from foreign competition by means of a specific tariff t. For simplicity, we assume that the domestic industry is a duopoly where each firm constitutes an interest group that tries to influence the government (i.e., $m = 2$ in equation (1) though the results can be generalized to the case of oligopoly). We also assume that the goods that the domestic and the foreign firms produce are perfect substitutes. Let y_{1t}, y_{2t} and y_{3t} denote respectively the output of the two domestic firms and of the foreign firm in period t. Total industry output is thus: $Q_t = y_{1t} + y_{2t} + y_{3t}$ and the inverse demand function is defined as $P(Q_t) = P(y_{1t} + y_{2t} + y_{3t})$. The inverse demand function is time-invariant and, for analytical convenience, we assume it to be linear: $P_t = s - (y_{1t} + y_{2t} + y_{3t})$.[6] The firms play a quantity-setting (Cournot) game in each period.

Production takes place with marginal costs $c(y_{jt}, q_{jt})$, j = 1, 2, 3 where q is an index representing the type of production technology used by each firm. Technologies are defined as $q_j \in [1, \Theta]$ such that higher values of q_j correspond to technologies with lower marginal costs.

Without loss of generality, we assume that there are only three levels of technology available. The foreign firm has already adopted the newest technology (denoted by $\bar{q}$) while the two domestic firms initially use less efficient technologies: $\underline{q}$ and $\underline{\underline{q}}$, with $\bar{q} > \underline{q} > \underline{\underline{q}}$ (i.e., one domestic firm is less efficient than the other). Faced with a

6 In this formulation, s can be interpreted as the size of the market.

liberalisation threat, domestic producers have the option of investing in cost-reducing technology. However, for producers to be able to do so, liberalisation may have to proceed gradually, since technology investment is costly.

Adoption of the new technology entails a cost $k(q)$ for the domestic firms, which depends on the extent of technological upgrading, i.e. $k(\underline{q}) < k(\underline{\underline{q}})$. If we assume that marginal costs of production are constant with respect to output, adoption of the new technology allows a cost saving of $\underline{s}$ or $\underline{\underline{s}}$, depending on the technology in use before replacement. Thus, the constant marginal cost of production is $\underline{c} = c + \underline{s}$ or $\underline{\underline{c}} = c + \underline{\underline{s}}$ with $\underline{q}$ or $\underline{\underline{q}}$ respectively, where c is the marginal cost of production with the new technology and, therefore, $c < \underline{c} < \underline{\underline{c}}$. In each period, a firm possesses the technology used in the previous period and this is the only link across periods.

Domestic firms offer the government political contributions C_{jt} to influence its decisions about the setting of the tariff. Thus, in period t, the domestic firms' (gross of contributions) profits are:

(3) $\Pi_{jt} = P(Q_t)y_{jt} - c(q_{jt})y_{jt} - k(q_{jt}) \quad j = 1, 2$

where $k(q_{jt})$ is zero if firm j chooses not to upgrade its technology.[7] The foreign firm does not engage in lobbying and does not consider upgrading its technology since it already employs the best technology. Therefore, the foreign firm's profits are:

(4) $\Pi_t = P(Q_t)y_{3t} - c_3 y_{3t} - t_t y_{3t}$.

Social welfare is the sum of consumer surplus, gross-of-contribution profits (of domestic firms), and tariff revenue:

(5) $W_t = \int_p^s D(u)du + \sum_{j=1}^{2} P(Q_t)y_{jt} - \sum_{j=1}^{2} c(q_{jt})y_{jt} - \sum_{j=1}^{2} k(q_{jt}) + t_t y_{3t}$

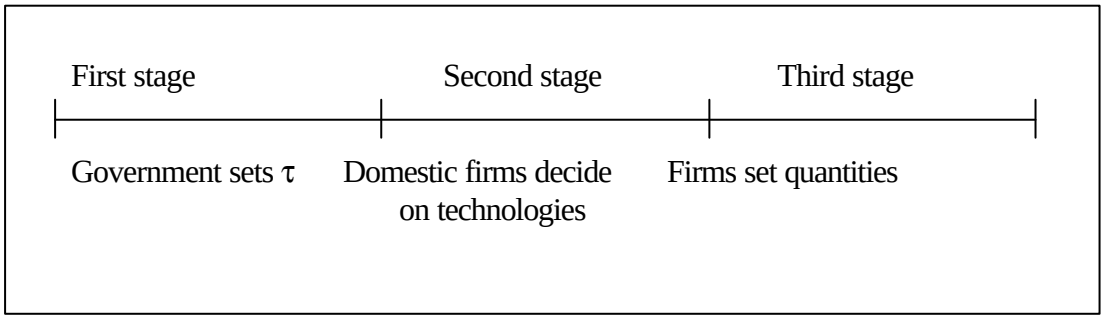
where consumer surplus (i.e., the first term) simplifies to $\frac{1}{2}(s - P)^2$ with the linear demand function we have assumed.

7 Following the assumption that the marginal costs of production are independent of the output level, the expression of marginal cost only depends on the technological level.

In each period, the government and the three principals (i.e., two domestic firms and the IFI) interact in order to set the import tariff. The domestic firms decide whether to upgrade their technologies and compete on quantities with the foreign firm in the domestic markets. Since the interaction over time between the domestic lobbies, the government and the IFI are rather complex, the analysis in the paper is based on a strictly defined sequence of events.

In particular, we restrict the dynamic nature of the game to a two-period model. Each of the two periods has three stages, as set out in Figure 1. The first stage defines the political equilibrium. On the one hand, the domestic firms determine their schedule of political contributions and the IFI chooses the amount of assistance. On the other hand, the government, faced with these schedules of donations and assistance conditional on the level of tariff, sets the tariff to maximise its payoffs. In the second stage, domestic producers decide their technology investment, given the tariff. In the third and final stage, the firms set their levels of production playing a Cournot game.

Figure 1: timing in each period



In common agency models, stages one and two of the game are normally in reverse order, since producers typically take some relevant decision before offering their schedule of donations to the government (see, for example, Brainard and Verdier, 1994). Thus, as the producers' decision is determined before the government's decision about tariffs, the government is prevented from choosing the tariff level strategically to influence the
producers' decisions. On the contrary, since the producers' decisions precede the offer of a schedule of donations, the lobbies are those who can behave strategically and preserve their lobbying power in future periods.

The inclusion of the IFI in the model justifies the change we made to the sequence. Despite a recent greater emphasis on country ownership of reform programmes, it is not unrealistic to argue that the IFI retains very significant leverage on the size and terms of the programme. Once the programme is initiated, however, the government decides the extent of conditionality implementation. In these circumstances, the initiation of a programme inevitably leads to some reactions on the part of economic agents in order to benefit from the programme. This suggests that an appropriate sequence of events places the setting of the tariff before the producers' actions, and this is exactly the timing used in this paper.[8]

4. THE SOLUTION OF THE MODEL

The model needs to be solved by backward induction in each period and then backward from the second to the first period. To begin with, it is worth analyzing the equilibrium in a given period ignoring the dynamic link induced by the technological decisions.

4.1. The static solution

The third stage is a standard Cournot problem where firms compete on quantities taking the import tariff, the contributions and the technologies as given: [9]

$$(6)\quad \begin{cases} \max\limits_{y1} P(Q)y_1 - c(q_1)y_1 - k(q_1) - C_1 \\ \max\limits_{y2} P(Q)y_2 - c(q_2)y_2 - k(q_2) - C_2 \\ \max\limits_{y3} P(Q)y_3 - c_3 y_3 - ty_3 \end{cases}$$

The resulting first order conditions deliver the following equilibrium:[10]

$$(7)\quad \begin{cases} y_1 = 0.25(s + c_2 + c_3 + t - 3c_1) \\ y_2 = 0.25(s + c_1 + c_3 + t - 3c_2) \\ y_3 = 0.25(s + c_1 + c_2 - 3t - 3c_3) \end{cases}$$

8 It may be noted that, in the model, the amount of lending is strictly and continuously related to the actual extent of the reform. Thus, this modelling strategy may be applicable to floating tranches (an arrangement quite common in the World Bank whereby disbursement is related to the actual implementation of conditions) but is less suited to distinguish between ex-ante and ex-post conditionality.

9 In this section we will not keep track of the time subscript.

10 Given our assumptions, the second order conditions are satisfied as well.

where c_j (j = 1, 2, 3) represent (constant) marginal costs. The more efficient of the two domestic firms will have a higher market share than the other. The more efficient the domestic firms are and the lower the amount of imports.

In the second stage, domestic firms have to decide whether to invest in technology in order to become more efficient. However, investment is discrete since firms can only upgrade to an existing technology. The two domestic firms are asymmetric in this regard because they start from different technological levels and we will assume that only the more efficient of the two firms can upgrade.[11] If it does, it obtains the same technology used by the foreign firm. Given a discrete maximization problem, investment will take place if the implied cost savings more than compensate for the cost of the investment, taking into account that a more efficient technology allows the firm to gain a larger market share.

The first stage of the game delivers the political equilibrium of the common agency problem. Such problems admit more than one solution depending on the shape of the contribution schedules announced by the principals. However, we follow standard practice and focus on the truthful equilibrium. Bernheim and Whinston (1986) show that players are not worse off by playing truthful strategies rather than any other strategy and that truthful strategies are also coalition-proof. Intuitively, a truthful equilibrium is one where the contribution schedules offered by the principals to the agent reflect the principals' true preferences.

Formally, $(\tilde{C}_1, \tilde{C}_2, \tilde{F}, \tilde{t})$ is a subgame-perfect Nash equilibrium of the political game if and only if:

(i) $(\tilde{C}_1, \tilde{C}_2, \tilde{F})$ are feasible;

11 We are implicitly assuming that the cost of upgrading from the most inefficient technology is prohibitively high. This simplifying assumption has the advantage that the model can ignore the strategic interactions that would occur when both firms can upgrade their technologies. This would unnecessarily complicate the model and muddle the analysis of the role of conditionality. Nevertheless, allowing both firms to invest may be an extension worth pursuing in future work.

(ii) $\tilde{t}$ maximises $\sum_{j=1}^{m} \tilde{C}_j(t) + \tilde{F}(t) + aW(t)$; that is, $\tilde{t}$ maximizes the government's objective function given the interest groups' and the IFI's contribution schedule;

(iii) $\tilde{t}$ maximises the joint welfare of each interest group and the government;

(iv) for every principal, there exists a $\underline{t}$ that maximises $\sum_{j=1}^{m} \tilde{C}_j(t) + \tilde{F}(t) + aW(t)$ such that the contribution from the principal is nil. The government finds $\underline{t}$ equally attractive as $\tilde{t}$, when the principals' contributions are positive.

Without going into the details,[12] the first condition is a simple feasibility requirement while conditions (ii) and (iii) allow us to determine the optimal tariff without the need to calculate the actual level of the contributions. In fact, the first order condition from (ii) and the three first order conditions (i.e., one per principal) from (iii) jointly imply that the marginal change in a principal's contribution equals the marginal change in that principal's utility:

$$(8)\quad \begin{cases} \dfrac{\partial C_1(t)}{\partial t} = \dfrac{\partial \Pi_1(t)}{\partial t} \\ \dfrac{\partial C_2(t)}{\partial t} = \dfrac{\partial \Pi_2(t)}{\partial t} \\ \dfrac{\partial F(t)}{\partial t} = b\dfrac{\partial W(t)}{\partial t} \end{cases}.$$

The expressions in (8) show that contributions are "locally truthful" around the equilibrium level of t since they reflect the true preference of the principal. However, if the contributions need to be computed, condition (iv) is required to obtain the level of (net of contribution) benefits achieved by each interest group. Indeed, the application of the above definition of subgame-perfect Nash equilibrium to the present setup is complicated by the fact that the chosen tariff level has an effect on the (discrete) investment decision, which requires knowledge of the actual contribution levels. Our paper aims to analyze circumstances under which the government decides to act strategically in the first stage and increase the tariff rate in order to induce investment in the second stage. In particular, we are interested to see how this strategic effect is affected by the degree of conditionality imposed by the IFI.

12 See Grossman and Helpman (1994).

The solution of the model shows what the optimal tariff is. In order to understand the intuition behind its determination, it is useful to consider the extreme case where the investment cost is zero. In this case, the firm will obviously invest. In each period the optimal tariff - determined according to the truthful equilibrium - will take the following form:

$$(9) \quad t = \frac{(a+b)(5s + c_1 + c_2 - 7c_3) + 4(s + c_3 - c_1 - c_2)}{19a + 19b - 4}.$$

As the investment cost increases but remains low, the firm will still find it optimal to upgrade its technology even if the tariff is set according to (9). Thus, the government does not need to act strategically. However, if the investment cost is above a certain threshold ($\underline{k}$), investment will only take place if the tariff rate is higher than given by equation (9). As the cost of upgrading becomes higher and higher, there is a level of costs ($\bar{k}$) beyond which the government will not find it optimal to act strategically since it would suffer in terms of reduced welfare and reduced lending from the IFI. Hence, above the threshold $\bar{k}$, investment will not occur and the tariff will be again determined by (9) where the marginal cost of production for the relatively more efficient domestic firm (c_1) is clearly higher than when the firm invests in technology.

In the polar cases of investment costs below $\underline{k}$ and above $\bar{k}$ respectively, there is no strategic effect of the tariff on the investment decision and there is no need to calculate the contribution payments. By imposing only mild conditions on the parameters, we can summarize this result by stating that the optimal tariff rate in (9) is decreasing in the weights attached by the government and the IFI to welfare, increasing (decreasing) in the domestic (foreign) marginal costs, and increasing in the size of the market: i.e. $t = t(\overset{-}{a}, \overset{-}{b}, \overset{+}{c_1}, \overset{+}{c_2}, \overset{-}{c_3}, \overset{+}{s})$.

For intermediate values of the investment cost, the more efficient domestic firm will invest if and only if the government acts strategically. In this case, its marginal cost depends directly on the tariff rate, which in turn depends on the investment cost. The analysis of this case is complicated by the fact that it requires the determination of the contribution levels, since the investment decision is based on the comparison of net profits with and without technological upgrading. The equilibrium truthful contribution schedules for each principal (or truthful transfer vector) are defined as follows:

$$(10)\quad \begin{cases} C_1(t) = \max[\,\Pi_1(t) - B_1, 0] \\ C_2(t) = \max[\,\Pi_2(t) - B_2, 0] \\ F(t) = \max[\,bW(t) - B_{IFI}, 0] \end{cases}$$

where the B_i are the net payoffs the principals receive when participating in the menu action.[13] Each principal would like to set them at the highest possible level but has to consider the effect that this would have on the government's policy choice. On the one hand, the higher the net payoffs (i.e. the B_i), the lower is the contribution that the principal pays to the government; on the other hand, however, the lower contribution may induce the government to set a policy opposed by the principal. Therefore, the net payoffs are endogenously determined for each principal in such a way that they are the highest for which the government would still set the policy supported by the principal.[14]

4.2 The dynamic solution of the model

Our two-period model is dynamic because technology is a state variable such that any upgrade that takes place in the first period is permanent. Given that the cost of technological upgrading does not change over time, investment cannot be optimal in the second period if it is not optimal in the first period. Therefore, if investment takes place, it occurs in the first period only. Nevertheless, the existence of the second period is relevant for the investment decision because the firm takes account of the cost savings accruing in both periods. Similarly, the government may decide to strategically influence the firm's investment decision because of the gains in welfare over the two periods.

The procedure for solving the dynamic game is rather complex because the optimal tariff level cannot be calculated by simply employing equation (9). It is necessary to determine if the domestic firm invests (in the first period), which in turn requires one to know the contributions that the principals pay in the first stage. As equation (10) makes it clear, the contributions are obtained by specifying the net payoffs B_i. In our two-period model the procedure for pinning

13 The max[?] function selects the maximum between the values in square brackets, thus guaranteeing that contributions are never negative.

14 The mathematical procedure to calculate these net payoffs is based on what would happen if the principals were not to contribute. Condition (iv) of the subgame-perfect Nash Equilibrium is applied in these

down the endogenous payoffs requires the calculation of the second-period tariff for each possible combination where one principal does not contribute in the first period.

Given the complexity of the whole procedure, it is not possible to derive closed form analytical solutions of the model and we will have to rely on simulations. Yet, the intuition of the forces at work is quite simple. The government may act strategically in the first period and set a high tariff rate in order to induce the firm to invest and reap the benefits over the two periods. Our interest is to identify the role that conditionality plays and whether it affects the probability that the firm upgrades its technology and becomes more competitive.

5. SIMULATIONS AND DISCUSSION OF THE RESULTS

Despite the complexity of the model, its results are straightforward. However, attention should only be paid to the qualitative results of these numerical exercises since the values assigned to the various parameters are not calibrated. Therefore, and in order to avoid confusion, the graphs below represent the qualitative aspects of the model and do not report any numerical values.[15]

Figure 2 illustrates the possible outcomes in terms of optimal tariff rates and investment decisions in relation to the exogenous cost of investment (k). The figure illustrates two different cases. For the moment let us concentrate on what we refer to as the 'benchmark case', where we have set equal numerical values for the parameters a and b (i.e., the IFI and the government put the same weight on social welfare in their objective functions).[16]

The decision whether or not to undertake technological upgrading depends on both the cost of investment and the tariff rate. More precisely, investment takes place if, over the two periods,

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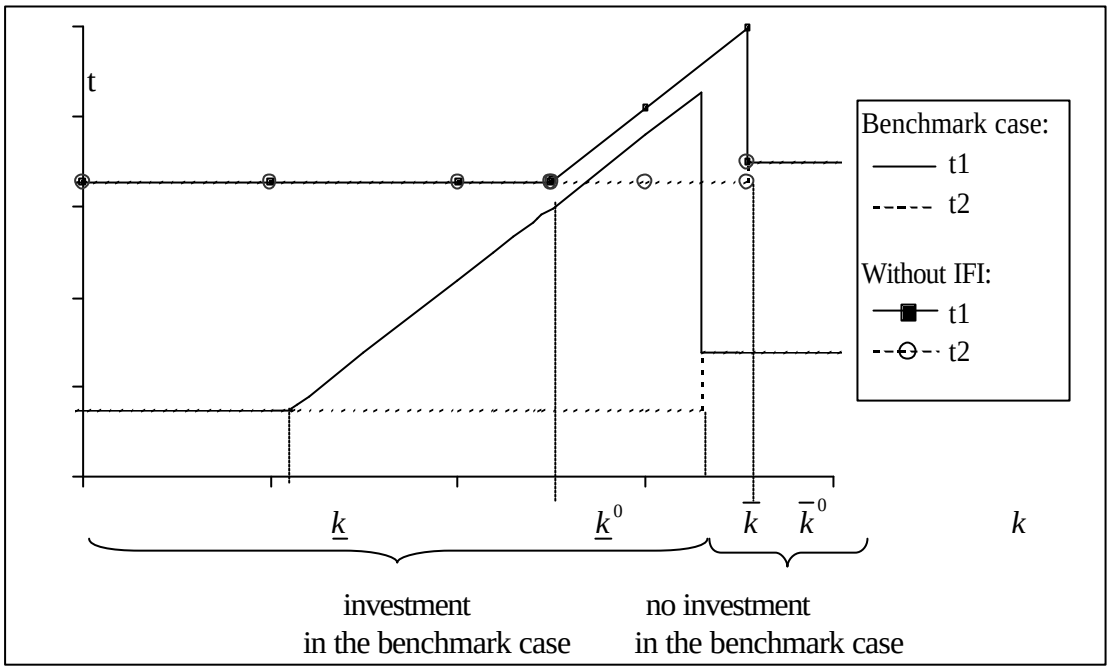
calculations. See Grossman and Helpman (1994) for a detailed description of the procedure to calculate net payoffs.

15 The graphs are also drawn with different scales for the horizontal and vertical axes and in different proportions in order to focus on the aspects being evaluated.

the additional profits resulting from technological upgrading compensate for the cost of making this investment.

Figure 2: tariff rates with and without the IFI



A crucial factor in this investment decision is the government's tariff setting behaviour. Adopting the modern technology raises profits on two accounts: it reduces the cost of production and allows the firm to gain a larger share of the market. In our setting, these benefits are concentrated over two periods only and are partly offset by the cost of making the investment. The role of the tariff is that of maintaining the profits of the domestic firm high by protecting its sales in the domestic market. This allows the firm to undertake the investment in technology.

16 Specifically, the parameters used in the benchmark case are as follows: a = b = 5; s = 6; c_1 = 1 (before upgrading); c_2 = 2; c_3 = 0; ß = 0.95.

Figure 2 shows that, if the cost of technological upgrading is below a critical value $\underline{k}$, the domestic firm finds it profitable to invest.[17] By contrast, when the cost is above a critical value $\overline{k}$, no investment takes place. For investment to occur, the firms would require such a high tariff that its distorting effects on social welfare would outweigh its benefits in terms of profits. Under these circumstances, a government that cares about social welfare sets a lower tariff that, although resulting in lower profits for the domestic firms and – accordingly – low political contributions, would result in a higher level of social welfare overall. The optimal tariff rate is obviously higher when the investment cost is high, since the high tariff can safeguard a certain level of profits for the domestic inefficient firms.

Figure 2 also shows that there is an intermediate range of investment costs ($\underline{k} < k < \overline{k}$) for which the occurrence – or non occurrence – of technological upgrading depends crucially on what the government does in terms of the tariff rate. In this range, the domestic firm requires greater protection than that granted by a tariff rate set according to equation (9). Without it, the firm would not make the investment in technology. From the firm's viewpoint, an inappropriately low tariff rate would increase competition from the more efficient foreign producers and could reduce its profits to a level that would not allow the firm to meet the investment cost. Or, as another possibility, the increase in profits induced by the technological upgrading could fall short of the upgrading cost. A higher tariff rate in period one raises the firm's profits and induces it to undertake the investment. While the tariff rate required by the firm rises with the increase in investment costs, the government is prepared to accommodate the firm's demand for protection since it gains from investment taking place. As discussed above, it is only when the cost of technological upgrading is above a critical value $\overline{k}$ that the government is no longer willing to protect the domestic firm to the extent required for investment to take place.

Figure 2 shows that, for low investment costs ($k < \underline{k}$) as well as high costs ($k > \overline{k}$), the optimal tariff rate in period two is the same as that in period one. This is because, with such values of

17 In our duopoly setting the optimal tariff is higher than zero, as instead would be the case under perfect competition, even for zero investment costs. This is because the government can extract rents from the foreign firm by imposing a tariff.

investment costs, the government does not act strategically, for the optimal tariff rate is such that technological upgrading either occurs or it does not. The level of the tariff in period two depends on whether the domestic firm made the investment in period one. If it did not, the government has to maintain a relatively high tariff rate in order to protect the domestic inefficient firms from foreign competition. Thus, as in period one, the optimal tariff rate in period two is higher with $k > \bar{k}$ than $k < \underline{k}$.

In the intermediate range of investment costs ($\underline{k} < k < \bar{k}$) the government prefers to act strategically, setting a high tariff rate in period one in order to induce technological upgrading. Once investment has taken place, the government can reduce protection for the domestic firm and lower the tariff rate in period two. In this second period, the optimal tariff rate is at the same level as when investment occurs without strategic behaviour by the government. Thus, within the intermediate range of investment costs, the optimal reform strategy is a gradual liberalisation.

The range of investment costs for which the government finds it optimal to maintain a high tariff in period one and reduce it in period two depends on all the parameters of the model. The government evaluates how its tariff-setting behaviour will affect the size of contributions from the domestic firms, the amount of conditional assistance provided by the IFI and social welfare, both in the present and the future.

The second case in Figure 2 is that of an indigenous reform without financial support from the IFI. For the parameter values used in the simulations, the tariff rate set by the government in the first period is higher than in the benchmark case for all values of the investment costs.[18] Thus, when investment costs are low, the relatively high tariff – compared with the benchmark case – makes it unnecessary for the government to behave strategically for investment costs below $\underline{k}^0$, where $\underline{k}^0 > \underline{k}$.

18 It will be shown later that whether conditionality is effective in reducing the tariff rate set by the government depends on the amount of financial assistance provided by the IFI, which is in turn affected by the size of the

The implication of a high tariff rate in period one is that the range of costs for which investment takes place is wider, for the high tariff allows the more efficient firm to meet upgrading costs up to $\bar{k}^0$, where $\bar{k}^0 > \bar{k}$.

As in the benchmark case, the government reduces the period-two tariff rate after the strategically high tariff protection has allowed the domestic firm to upgrade its technology. The tariff in period two is always unambiguously lower when the IFI provides financial assistance than when it does not, except in the interval of investment costs between $\bar{k}$ and $\bar{k}^0$, where it could be higher or lower.[19] The reason is that, over such interval, the government can afford to lower the tariff when the IFI provides no assistance because investment has taken place while, when the IFI is present, the domestic firm needs greater tariff protection because it has not been able to meet those investment costs and upgrade its technology.

The comparison of the two cases in Figure 2 suggests that conditionality can alter the country's political equilibrium and lead to a greater reduction in economic distortions than when the IFI provides no assistance. This is beneficial for the country's welfare. However, there may be a range of investment costs (for $\bar{k} < k < \bar{k}^0$) where conditionality may be less effective or even counter-productive for social welfare. In fact conditionality may lead the government to liberalise too early, with the effect of reducing the possibility for domestic firms to upgrade their technology. Without a positive investment response from the domestic firms, even a government committed to reforms may have to maintain relatively high tariff protection. In this case, second-period welfare might well be lower than if the government had not sought assistance from the IFI. Here it may be argued that conditionality has been used to induce the government to do something that it would not

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parameter *b* in the IFI's objective function. This parameter represents the weight of the recipient country's social welfare in the IFI's utility.

19 In Figure 2 the period-two tariff rate is always lower in the benchmark case, even in the interval between $\bar{k}$ and $\bar{k}^0$. However, this is only due to the specific parameter values used in the simulations.

choose to do without financial assistance (Collier *et al.*, 1997) or, in other words, to 'buy reform'. Conditionality as an inducement is obviously not compatible with borrower ownership.

What is the effect on the economy if the IFI imposes tighter conditionality, in the sense of wishing to see the government setting even lower tariff rates? It is important to remember two characteristics of our setup. One, the benchmark case assumes communality of interests between the government and the IFI. The government and the IFI possess the same economic model, according to which welfare is a negative function of the trade distortion. Moreover, the government is committed to reduce the distortion. Hence it is possible to speak of the government's ownership of the reform programme. Two, our model is an optimizing model in the sense that the adoption of a policy other than the equilibrium policy cannot deliver a better outcome for all parties simultaneously, given the specific form assumed for each party's objective. Hence, in this setup, a reduction in tariff rates greater than in the benchmark case can only result from a shift in the parties' objectives.

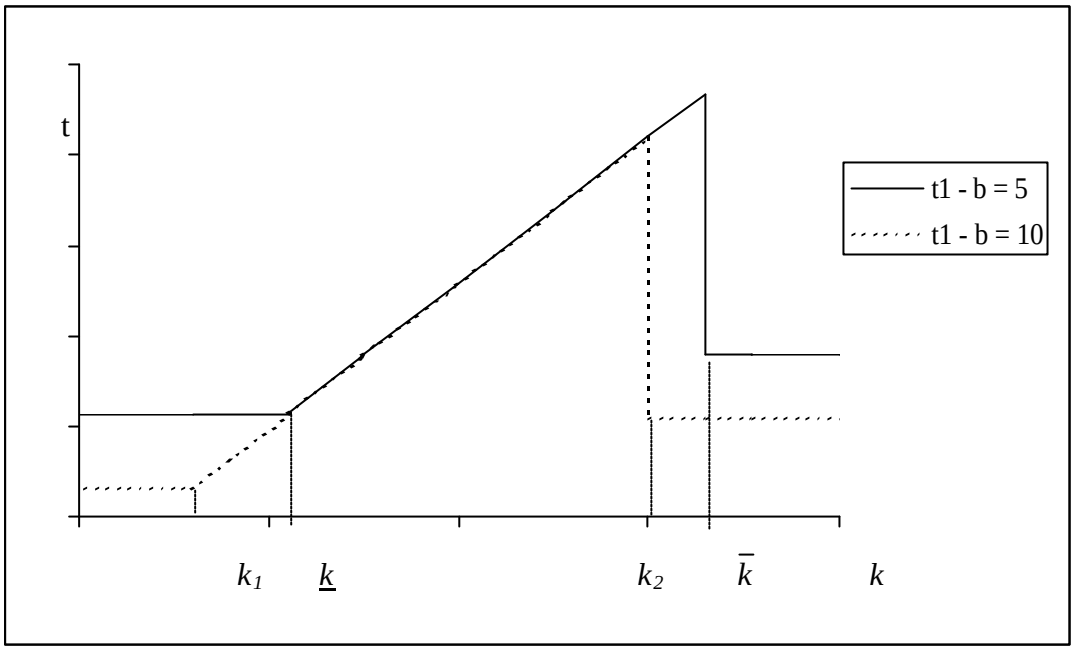
One way to generate faster liberalization in the model is by changing the slope of the IFI's objective function assuming that the parameter b, which represents the weight that the IFI attaches to the recipient country's social welfare, is larger.[20] In this case, the IFI is willing to provide more financial support for policies that raise social welfare. A change in this parameter still maintains the alignment between the IFI's and government's objectives but it depicts a stronger stance on the part of the IFI when confronting the government and the other interest groups.

Figure 3 illustrates this case and compares it with the benchmark. For simplicity, the figure focuses on the first period tariff rates since it is only in the first period that investment can take place and the government may act strategically.[21]

20 Alternative changes in the objective function of the IFI can be made without altering the qualitative results.

21 The tariff rate in the second period can be easily inferred from this figure since it equals the lower tariff (for each b) when investment takes place and the higher one if investment does not occur.

Figure 3: comparison of different conditionality levels



Notes: when $b = 5$ ($b = 10$), investment takes place up to $\bar{k}$ (k_2).

Figure 3 shows that, for the parameter values used in the simulations, a larger b results in faster liberalization only for certain ranges of investment costs. More precisely, the tariff set by the government is always lower than in the benchmark case for those low costs and those high costs of technological upgrading where the government does not act strategically (that is, for $k < \underline{k}$ and $k > \bar{k}$). For low values of k, investment occurs even when a low tariff rate prevails; for high values of k, investment does not occur even with a relatively high tariff rate. The government is prepared to reduce the tariff rate because this raises both social welfare and – due to a higher b – the contributions (per tariff reduction) from the IFI. The increases in these two components of the government's objective function outweigh the reduction in the domestic firms' contributions. Equation (9) above shows that the optimal tariff rate without strategic behaviour by the government is indeed decreasing in b. It may be noted that, because of the fiercer competition from the foreign firm that the low tariff induces, the government needs to set a higher tariff and behave strategically for a range of investment costs lower than in the benchmark case (in fact, for $k_1 < k < \underline{k}$).

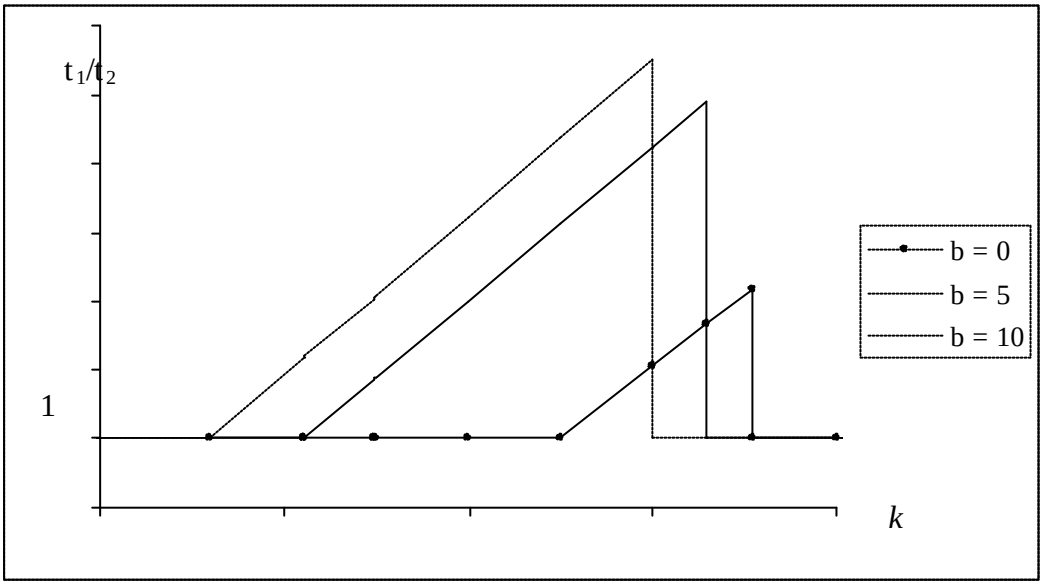
Figure 3 also shows that a larger *b* results in a lower tariff than in the benchmark case also for a range of investment costs lower than $\bar{k}$, that is, for $k_2 < k < \bar{k}$.[22] In this interval, however, the domestic firm does not upgrade its technology. A higher value for *b* implies that the IFI is less willing to provide lending for high values of the tariff rate. For $k_2 < k < \bar{k}$, the domestic firm is prepared to invest only if the tariff rate is high but, at this rate, the government would receive a lower amount of financial support from the IFI with the consequence that its welfare would actually be lower. Thus, in the case of a larger *b*, tighter conditionality and faster liberalization reduce the range of investment costs for which it is worthwhile for domestic firms to upgrade their technology, resulting in greater technological backwardness than in the benchmark case. Moreover, since in the second period inefficient firms require higher tariff protection than if they had invested in technological upgrading, the resulting tariff rate may be higher than in the benchmark case. Correspondingly, social welfare may also be lower.

In Figure 3 there is an intermediate range of investment costs (that is, $\underline{k} < k < k_2$) for which the first-period tariff does not vary with the increase in *b*. Over this range of costs, the tariff rate that the government sets is at the lowest possible level that ensures that investment takes place. The increase in *b* appears to have no effect on the government's tariff setting behaviour because, for the parameter values used in the simulations, the amount of financial assistance offered by the IFI is not high enough to persuade the government to set a lower tariff. Doing so would expose the domestic firms to foreign competition and make it impossible for the more efficient one to upgrade its technology. Over this range of investment costs, the amount of financial assistance from the IFI does not compensate the government for the costs involved in lowering the tariff – arising from the reduction in contributions from the domestic firms and the decrease in social welfare when technological advancement does not occur. Greater financial support from the IFI – resulting from higher values of *b* – would lead to a reduction in the tariff compared with the case depicted in the figure, but this would be accompanied by a drop in investment and a fall in social welfare.

22 The fact that in the graph such interval is fairly small is a pure artifact of the particular parameters chosen in the simulations and does not diminish the relevance of the conclusion.

Figure 4 summarises these results in a slight different way by reporting the ratio of tariffs in the first and second period when the parameter *b* takes on three different values. A ratio greater than one reflects strategic behaviour on the part of the government and the implementation of gradual liberalization (as tariff rates are decreased over time). This representation illustrates two related aspects. First, the range of investment costs that prompt strategic action is a function of the degree of conditionality. Second, stricter conditionality prevents some investment from taking place.[23]

Figure 4: ratio of tariffs (t_1/t_2) in the two periods



23 Stricter conditionality induces strategic behaviour for lower levels of the cost of investment due to the downward pressure on the tariff. As a consequence, stricter conditionality also implies higher percentage increases in the tariff level between the two periods (as shown by the fact that tariff ratios in the figure are higher (for the same level of investment cost as *b* is higher).

The discussion so far has made several references to the effects of policy decisions on social welfare, though these have not been explicitly shown. We now turn to this task and begin by analysing how welfare in the two periods is affected by investment costs and the decision to upgrade. Welfare in period one is a decreasing function of the cost of investment. If there is no strategic behaviour, welfare decreases in a one to one ratio with the cost, i.e. for $k < \underline{k}$. However, when the government raises the tariff level in order to induce the upgrade (for $\underline{k} < k < \overline{k}$), welfare declines more than in a one to one ratio because the higher tariff decreases consumer surplus more than it raises profits and tariff revenue. When the investment cost rises to the point that no upgrading takes place (for $k > \overline{k}$), welfare in period one increases but the increase is less than proportional to the investment cost. The reason is that the economy is now more inefficient, which leads to lower and more expensive output.

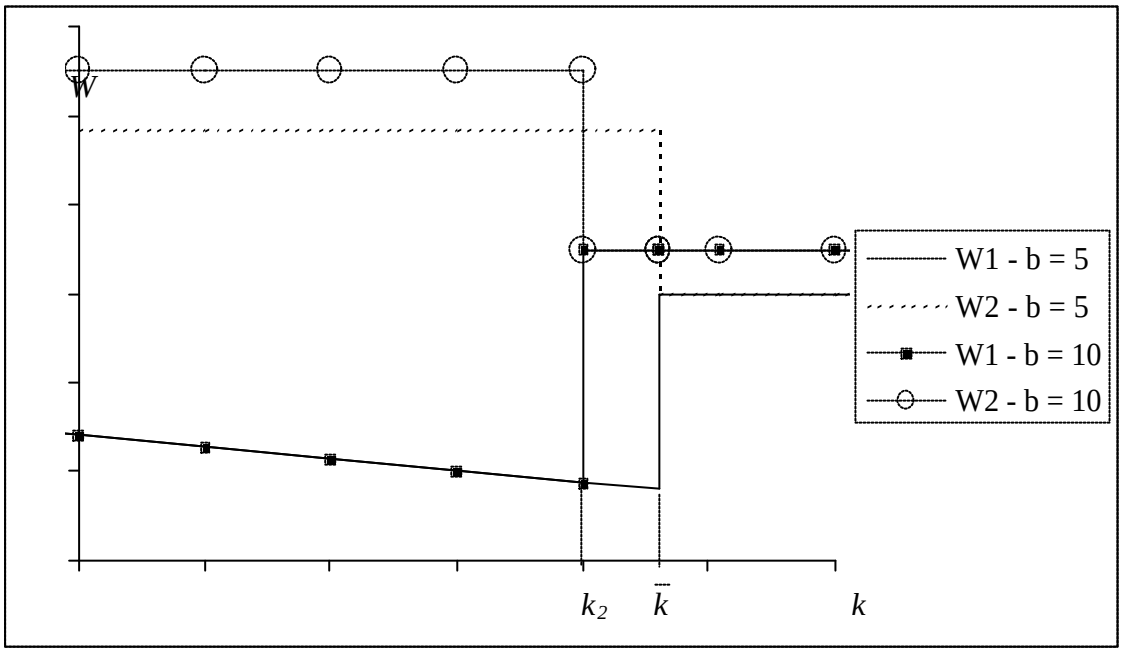
If investment occurs, period-two welfare is constant at the level that would have obtained if the cost of investment had been zero. The cost of investment has no effect on period-two welfare because investment has taken place in period one and firms have already incurred such cost. If investment does not occur, period-two welfare is similarly unaffected by the cost of investment but is lower than what it would be after technological upgrading because of the economic distortions caused by the higher tariff.

What is the effect of stricter conditionality on welfare? Figure 5 compares the benchmark case with the case where the parameter b in the IFI's objective function is larger. In the latter, period-one welfare is higher than in the benchmark case if investment takes place without strategic behaviour (for $k < \underline{k}$)[24] or if it does not take place (for $k > \overline{k}$). As we have seen, a larger b leads to a lower tariff over those ranges of investment costs. Between $\underline{k}$ and k_2, where the government acts strategically, tighter conditionality does not result in lower tariff rates and, therefore, first-period welfare is the same as in the

benchmark case. However, for the range of costs where investment does not take place because of stricter conditionality (i.e., $k_2 < k < \overline{k}$ in Figure 3), period-one welfare is higher

when conditionality is more stringent but period-two welfare is lower because of the lack of technological upgrading.[25] Thus, there is a range of investment costs where stronger conditionality eliminates investment and is welfare decreasing. In this sense, pressure to liberalise may result in an inferior outcome in terms of efficiency and welfare.

Figure 5: welfare and conditionality in the two periods



Simulations of the effect of changes in other parameters (e.g., marginal costs, size of the market, etc.) do not change the qualitative results. In particular, whether stronger conditionality leads to higher or lower welfare depends on the precise range of investment costs.

6. CONCLUSIONS

The main objective of this paper was to show that whether conditionality and ownership are in conflict depends on the design of reform. We have discussed this issue within a dynamic common-agent framework to model the interactions between an IFI, the government and the

24 Not shown in the figure.

25 Given the parameter values used in the simulations, the sum of welfare in the two periods (using the discount factor) can be lower when conditionality is stricter.

domestic interest groups. It has been shown that the implementation of reform programmes or the opposition to them depends in an important way on their design and the quality of policy advice. This stands in sharp contrast to the principle of selectivity according to which the responsibility for limited reform implementation rests with the recipient government's lack of commitment and inadequate institutions.

The results of the model simulations indicate that conditionality can alter the country's political equilibrium and be beneficial for the recipient country's welfare. However, there are circumstances under which conditional assistance leads to a reduction in the economic distortion at the cost of lower social welfare. The occurrence of this adverse outcome depends on all the parameters of the model, such as the strength of domestic pressure groups, the country's economic characteristics (e.g. the size of the domestic market, the backwardness of technology and the inefficiency of domestic industry), the impact of economic distortions and their removal on the general public's welfare, the responsiveness of the government to social welfare. The model thus suggests that conditionality must be tailored to each country's special characteristics. Reforms supported by the IFIs – even if first best – may not be optimal in the presence of a political economy constraint.

We echo the statement in the World Bank (2004) policy paper on DPL that there is no single blueprint for reform that will work in all countries. We add that conditionality can be effective and need not be detrimental to reform ownership. However, conditionality and ownership can only be reconciled if the design of the reform programme is appropriate to the country's circumstances. In particular, it is important to consider how conditionality directly affects the domestic political constraint. In practice, as suggested in this paper, the IFIs may need to adopt a gradual approach to reforms, even with a committed government, in order to loosen the political constraint. Moreover, since ownership depends on the content of conditionality, the IFIs may have to be prepared to support programmes that are not exactly their preferred choice.

Various extensions would add further realism to the model. The removal of tariffs could entail significant transaction costs, at least in the short run. The reform programme could be broadened to include macroeconomic policies, which through their impact on aggregate demand might cushion domestic firms' profits and enable them to undertake costly investment. Political elections or other forms of political consensus could be considered. The initial economic situation could be such that the status quo would not be tenable. The relationships between the IFI, the pressure groups and the government could be characterized by the presence of asymmetric information. In short, the model used in this paper had the minimum degree of complexity required to highlight certain political economy issues. We hope it was a worthwhile effort.

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