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ABSTRACT

Different countries have been following different reform paths since the early 1990s. We develop a simple dynamic model of policy reform that captures some of the determinants that underlie these differences. The model emphasizes the interaction between domestic institutions and international organizations that promote reform, on the one hand, and the political incentives for reversing reforms, on the other. At equilibrium, there are three types of reform paths. A country can undergo a full-scale, lasting reform; it can undertake a partial but lasting reform; or it can go through cycles of reforms and costly counter-reforms. Domestic institutions, as well as the incentives provided by international organizations, determine the equilibrium path. Unless the cost of reversal is high enough, an international intervention that promotes reforms induces an increase in the probability of reversals. A benevolent international organization that is fully aware of the possibility and social cost of reversals will always increase social welfare if it embraces the following principle: promote the greatest partial reform that is compatible with no reversal, or induce cycles of full-scale reform and complete reversal, depending on which of those two paths will generate greater social welfare. A benevolent but politically myopic international organization, however, may reduce social welfare because it does not take the fact into account that an overly aggressive reform could trigger costly reversals that outweigh the benefits of the reform. Deliberately making the costs of reversal high could be a risky way of improving the trade-off between the extent of the reform and the probability of reversal. Our model suggests that international organizations should also consider the possibility of providing defensive funding for dealing with counter-reform shocks.

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1 Introduction

In the early 1990s, many developing countries began to implement structural reforms. The paths followed by those reforms have differed greatly across countries. For example, Argentina underwent an aggressive structural reform process during the 1990s, but eventually rolled back many of those reforms in the following decade after experiencing a negative external shock and internal political instability. Brazil followed a less ambitious reform path during the 1990s, and the election of a former trade union activist as president in 2002 raised fears that its reforms might be reversed. Ultimately, however, there was no roll-back, although the government did take on a more important role in the economy and the privatization process slowed down. In the 1990s, Southern European countries embarked on a reform process to bolster their bid to become part of the Eurozone. So far, none of these countries has backtracked –and, in particular, none of them has renounced the Euro– even after having been engulfed by a severe economic crisis and, in some cases, such as Greece, coming under enormous internal political pressure for counter-reforms. Many former communist countries in Eastern Europe started up a reform process in the 1990s with a view to joining the European Union. Once they had entered the European Union, there were fears that compliance with the reforms would diminish since the possibility of being refused entry was no longer a threat. However, this has not proved to be the case so far.

Traditional schools of thought contend that the local institutional context is a fundamental factor in accounting for these different paths. While there is little doubt that local institutions play a very important role in determining the pace of structural reform, we argue that the interaction between local institutions and international organizations should not be ignored. When international organizations such the International Monetary Fund (IMF), the World Bank and the European Union offer to provide countries with funding for the implementation of structural reforms, they become important players in the eyes of local politicians and, consequently, the reform path is shaped not only by local institutions, but also by the incentives provided by those organizations. Traditionally, the focus has also been on factors that promote or block reforms. While this is key to an understanding of the political mechanisms behind a given type of reform, we argue that, in order to explain why structural reforms take the paths that they do, we must also understand the logic of counter-reforms.

In order to study the determinants of reform paths, including the role played by international organizations in that regard, we develop a dynamic model of reform that incorporates the following features: (i) Reforms are socially beneficial, but produce winners (the pro-reform coalition) and losers (the anti-reform coalition); (ii) The government has to provide reform opponents with at least partial compensation in order to succeed in passing reforms, but there are economic and institutional limits to the resources that it can mobilize for that purpose; (iii) The political landscape is unstable and, consequently, the government may come under the control of pro-reform or anti-reform coalitions, with the result that there are windows of opportunity for the introduction of reforms, but there are also windows of opportunity for their reversal; (iv) Reversing reforms is costly for everybody, including the anti-reform coalition; (v) International organizations provide funding for reforms and for helping the government to avert reversals.

In the model there are two domestic groups, the pro-reform coalition and the anti-reform coalition, and an international organization. In each period, the government, which is controlled by one of the domestic coalitions, selects the level of structural reforms. When the pro-reform coalition controls the government, it is possible to pass or sustain a previously adopted level of reform, but only if a fraction of the anti-reform coalition is compensated for the losses incurred during the period. There are two sources of funding for compensations. First, the government can tax the pro-reform coalition up to a fraction of its gains in the period. Second, the international organization provides funds to incentivize reforms. At the beginning of each period, the coalition that does not control the government has an exogenous random chance of gaining political control. Everytime that this takes place, there is a window of opportunity for reforms (when the pro-reform coalition gains control) or counter-reforms (when the anti-reform coalition gains control) to be implemented. While reforms required compensations, reversals are costly. A fixed cost of reversal must be paid by both domestic coalitions. There are four key parameters in the model that capture domestic institutional characteristics and international incentives to reform. The maximum tax that the government can impose on the pro-reform coalition and the incentive schedule offered by the international organization shape the revenue available for compensations. The fraction of the anti-reform coalition that must be compensated shapes the expenditure on compensations. Finally, the cost of reversal is the key parameter behind the anti-reform coalition reversal decision.

Depending on the institutional characteristics of the country (i.e., domestic funds available for compensations, the fraction of the anti-reform coalition that required compensation and the cost of reversal), but also on the amount of funding provided by international organizations and the terms and conditions attached to it, the equilibrium of the model induces one of the following reform paths: first, a country may experience a full-fledged, lasting reform that will never be reversed; second, a country may undergo a partial but lasting reform; third, a country may go through cycles of reform and counter-reform.

As a benchmark, let us consider a situation in which there is no international intervention. Whenever the pro-reform coalition controls the government, it tries to pass the most ambitious reforms possible because current reform decisions do not affect future reversal decisions. If the pro-reform coalition has to provide compensation to a significant proportion of the anti-reform coalition, but it has the necessary funds to do so, the country may undergo a full-fledged, lasting reform. Whenever the pro-reform coalition gains control, a comprehensive reform can be implemented. The anti-reform coalition does not have an incentive to introduce counter-reforms because it knows that compensations will cover a significant portion of the “losers” and, hence, there is no point in incurring the costs involved in reversing the reforms. When the pro-reform coalition must compensate a significant proportion of the anti-reform coalition, but it does not have the required funds to do so, the country experiences a partial but lasting reform. If there are not enough funds available to buy off a large enough segment of the anti-reform coalition, then the pro-reform coalition will not succeed in passing a full-fledged reform package. As a consequence, the pro-reform coalition is forced to implement more modest reform measures, which may be disappointing, but will also be less likely to be reversed. Finally, when the budget for compensation is large relative to the proportion of the anti-reform coalition that must be bought off in order to pass

a reform, the country will be prone to cycles of reform and counter-reform. If the pro-reform coalition has a large budget for paying out compensations and only a small fraction of the anti-reform coalition must be co-opted in order to pass a reform bill, then the pro-reform coalition will pass a very ambitious reform package. As a consequence, the majority of the anti-reform coalition will be faced with an aggressive reform and receive no compensation. In the short run, this is not an issue, but as soon as the anti-reform coalition has the chance of regaining the control of the government, it will initiate a counter-reform process. Notice that, ex ante, the pro-reform coalition may prefer to commit itself to select a more moderate reform or to compensate a higher fraction of the anti-reform coalition than strictly necessary, if this would avoid costly reversals. However, when the pro-reform coalition controls the government, the reform chosen in any given period does not affect reversal decisions in the future, which only depend on future expected levels of reform. The problem is that the pro-reform coalition cannot credibly commit to implement a future level of structural reform. In other words, the pro-reform coalition faces a commitment problem at the time of selecting the level of structural reforms adopted.

When an international organization provides funds to promote and sustain reforms, more ambitious reforms are passed, but reversals are also more likely. In other words, there is a trade-off between the extent of the reform measures and their stability. Formally, we show that the international intervention expands the region of the parameter space in which there is a full-fledged, lasting reform in equilibrium and the region of the parameter space in which there is a reversal in equilibrium. The logic is as follows. If the pro-reform coalition can use external funds to compensate the anti-reform coalition, it is easier for it to pass a more aggressive reform package. When a large part of the anti-reform coalition must be compensated, reversal is not an issue and, hence, the reform remains in place indefinitely. However, when only a relatively small proportion of the anti-reform coalition must be compensated, the availability of international funds also makes the reversal of reforms a more attractive option for the anti-reform coalition.

The model helps to explain the paths that reform efforts have followed in different countries. Consider some examples. In the 1990s, Brazil launched a process of structural reform. The government did not have the resources to compensate potential losers, who were powerful and required generous compensation. Although international funds were available, the amount of funding was not --given the size of the Brazilian economy and the political strength of the potential losers-- enough to significantly accelerate the reform process. As a consequence, Brazil implemented moderate, gradual reform measures. In 1999, the country underwent a serious economic crisis and international financial institutions provided fresh funds. A default on government debt was averted and the reforms were not reversed. In 2002, a left-wing party won the presidential election and fears of reversal spread. However, there was no roll-back. In terms of our model, Brazil is an example of a country in which partial, but lasting, reforms are in place. The reform measures were not reversed because they were moderate and because the few losers received generous compensation. In addition, the funds provided by the IMF and other institutions during the 1999 crisis may also have helped to avoid a counter-reform.

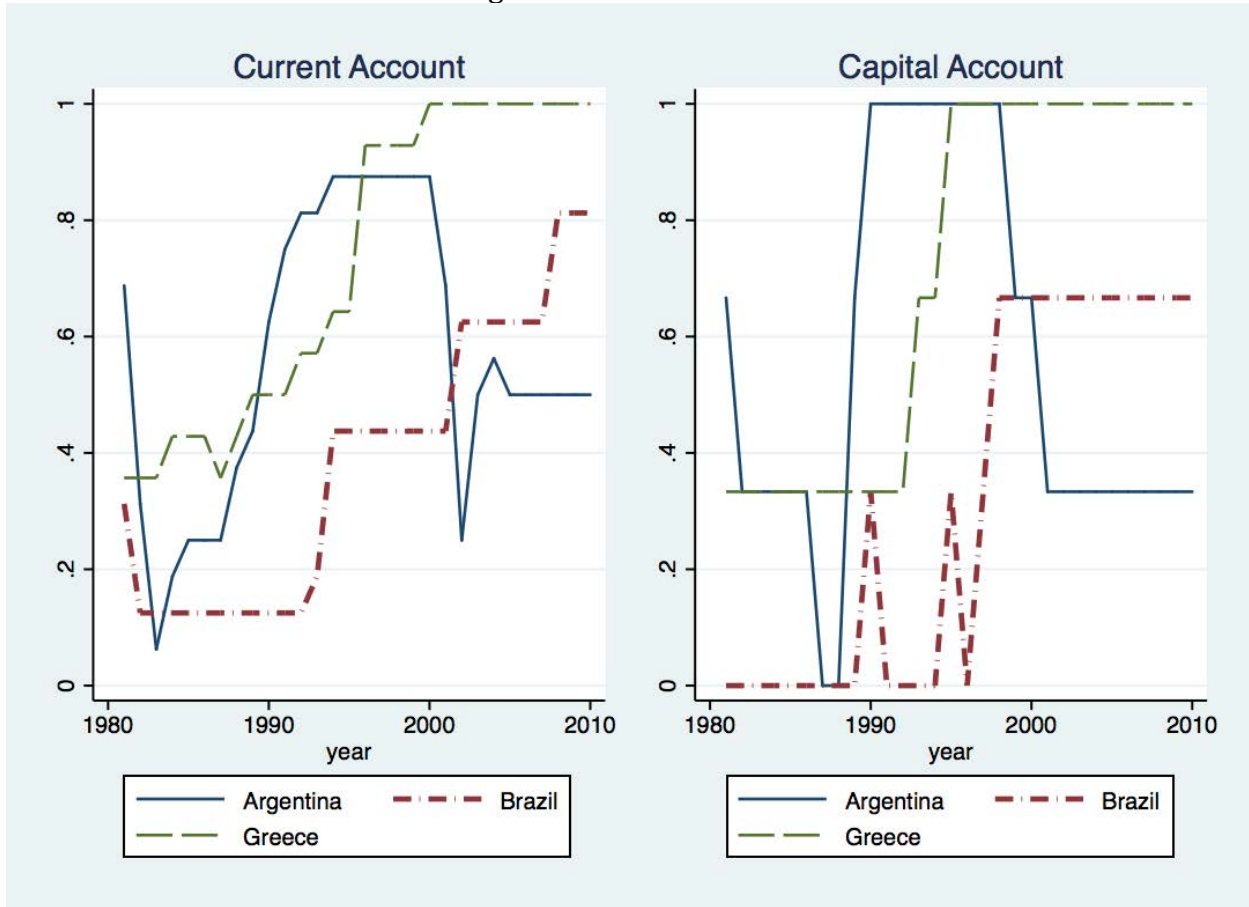
At the beginning of the 1990s, Argentina had a very limited budget for compensating the

potential losers in a reform process, but the pro-reform coalition succeeded in passing some reforms by compensating only a small proportion of the losers. Access to external funds from international organizations allowed the government to deepen its reform process. The proportion of losers who were not compensated was, however, very high and, as a result, the risk of reversal was also high. To deal with this risk, several strategies for increasing the cost of reversal were considered (e.g., full dollarization to reduce the probability that the hard-peg scheme could collapse (see Galiani, Heymann and Tommasi, 2003)). Following a severe economic crisis, in 2002 the country defaulted on its external debt and devalued the currency; at that point, a reversal of the reform process slowly began to occur. In terms of our model, Argentina is an example of a country that is prone to cycles of reform and counter-reform. Moreover, its instability has been exacerbated by the availability of external funding for reform efforts.

During the 1990s, Greece embarked on a reform program. By the end of the 1990s, Greece was able to fulfill the “Maastricht criteria”, and it joined the eurozone in 2001. Although the government’s ability to compensate reform-process losers with its own funds was quite limited relative to the segment of losers that required compensation, membership in the eurozone facilitated the reforms while at the same time significantly increasing the cost of reversal. During most of the 2000s, Greece did not deepen the reform process that it had undertaken in the 1990s. Then, the financial crisis of 2009 triggered a severe recession, and the country’s economic situation took a serious turn for the worse when it was revealed that the government had been wrestling with a hefty fiscal deficit for quite some time and had been falsifying its accounts. In 2010 and 2011, the European Union provided a bailout to the Greek government in exchange for harsh austerity measures and the enactment of sweeping structural reforms (privatizations and limits on free health care, for instance). In 2015, the anti-austerity Syriza party came to power by promising to repeal the bailout programs. So far, Syriza has not fulfilled its election promises and, more than six years after the start of the economic crisis, Greece is still part of the eurozone. In terms of our model, Greece is a country that, in the absence of international intervention, would have extremely moderate but long-lasting reforms. With the incentives provided by the European Union, however, more ambitious reforms became possible, but this also created incentives for their reversal. Nevertheless, the increase in reversal costs driven by the adoption of the euro and the provision of bailout funds by the European Union have so far impeded counter-reforms.

The three reform paths of Argentina, Brazil and Greece are depicted in Figure 1, where we have plotted the changes seen in two indices of reform based on the current and capital accounts of the three countries using data from the IMF (2008).

Figure 1: Reform Indices



The model also generates interesting normative results. In particular, we explore the welfare implications of the international interventions. If the international organization that is trying to influence domestic policy is fully aware of the possibility of reversals, then the intervention will always enhance the well-being of the country. However, if the international organization does not take the possibility of reversals into account or miscalculates the likelihood of such events, the intervention may induce an ambitious but temporary reform process which may be reversed later on, thereby reducing the country's well-being. Finally, we show that an international organization that limits its role to that of providing funds to promote reforms may have a worse effect than an international organization that does not actively promote reforms but does assist the country with fresh funds when there is a risk of reversal. In this sense, this extension of the model provides a political economy justification for the approach followed by the IMF during the Brazilian crisis and the European Union during the Greek crisis. At the same time, the extension casts some doubt on the wisdom of the IMF's actions during the Argentine crisis.

The literature on reform processes in developing countries is extensive. The political economy of reform became a very popular research topic after the fall of the Berlin Wall and the emergence of the Washington Consensus in the early 1990s. One crucial question shaped

this first wave of research on reforms: Why do countries fail to carry out efficiency-enhancing policies? Thus, the focus was on understanding the mechanisms that block reforms and discovering ways of overcoming them. Several theoretical models were proposed that produce status-quo biases and implementation delays. In a seminal work by Fernández and Rodrik (1991), the authors propose that it is not the existence of winners and losers in itself that blocks reforms, but rather uncertainty as to who will actually be winners and who will be losers. Whenever winners and losers cannot be identified beforehand, support for a reform may be weaker than it would be under complete information. Moreover, these authors show that the role of uncertainty is asymmetric since, if a reform is adopted and proves to be unpopular, it can be repealed while, if a reform is not adopted, there is no revelation of information. Thus, the status quo prevails. This provides a rationale for the irreversibility of many policies that are considered to be inefficient and for the failure to implement efficiency-enhancing reforms. Alesina and Drazen (1991) and Drazen and Grilli (1993) study the sources of delays in the implementation of reform measures. In their scenario, delays or inaction are the result of a distributional conflict. Different groups in a society do not agree on who should pay the costs of reform even when everyone agrees that a change is necessary. This triggers a “war of attrition” among different groups that does not end until one group concedes defeat and ends up paying the lion’s share of the reform’s costs. Similarly, Laban and Sturzenegger (1994) argue that macroeconomic stabilization is delayed until the situation reaches a point where one group is being hit so hard that it accepts conditions that it would have rejected before the crisis had become so serious.⁵

As in Fernández and Rodrik (1991), uncertainty about the distribution of the effects of the reform plays an important role in our model. The difference is that, in their model, winners and losers cannot be identified ex-ante while, in our model, winners and losers can be perfectly identified, but winners do not need to compensate all the losers, and the losers are therefore not sure whether they will receive compensation or not. As in Alesina and Drazen (1991) and Drazen and Grilli (1993), we also stress the importance of the influence that distributional conflict exerts on the dynamic of reforms. However, our focus is not on delays, but on the extent and stability of reforms, and especially on the effect that international organizations’ actions may have on these dimensions of the reform process. As a consequence, our model emphasizes the inherent political instability of developing countries’ reform processes, the role played by windows of opportunity for reform and counter-reform, and the costs associated with reversals. Thus, we build on this literature by incorporating two issues that, to the best of our knowledge, have not been systematically introduced into the study of the political economy of reform. First, most of the literature has focused on domestic factors that block or promote reforms. The role of external agents in the reform process has not been completely ignored, but it has not been fully integrated into reform models either. Second, not many studies have focused on the possibility that reforms

⁵ Regarding the factors that move a reform process forward, the answers are less clear. Part of the literature on status-quo bias and reform delay deals with the issue as to whether economic crises are catalysts for reform. As Rodrik (1996) points out, this is partly a tautological question: reform only becomes an issue when policies are perceived to not be working properly, and a crisis may actually be the result of that inadequacy. However, Rodrik (1994) also suggests that only under severe economic conditions does the efficiency gain from reform outweigh the political cost of redistributing resources in a society. In this sense, only under exceptional circumstances can microeconomic reform “sneak in” along with macroeconomic stabilization policies.

could be reversed.

Regarding the role of international organizations, Williamson (1994) points out that international aid can help governments that are committed to a reform process to survive long enough to introduce reforms but that, if international aid is channeled to governments whose commitment to reform is dubious, then it may be counterproductive. In the same vein, Rodrik (1996) discusses the mixed consequences that international aid may have on the pace of reform. On the one hand, he argues that providing fresh funds to a government may mitigate the short-term costs of structural reforms. On the other hand, those funds also reduce the costs of doing nothing. In our model, a politically myopic international organization that is not fully aware of the possibility of reversals may have a negative impact on a country's level of well-being. The mechanism, however, is not one in which international aid ends up in the hands of governments that are not committed to the reform process. Indeed, in our model, only the pro-reform coalition obtains funds from international organizations, and it uses those funds to help it to pass more far-reaching reform measures. The problem is that the pro-reform coalition could use these extra funds to pass an overly aggressive reform by temporarily co-opting a small proportion of the anti-reform coalition, which constitutes the perfect environment for a later reversal.

The literature on incentives for counter-reform includes a number of studies on the effects that veto players can have on reforms and reversals. Cox and McCubbins (2001) argue that veto players make reforms less likely, while Keefer and Stasavage (2003) argue that veto players also make reversals less likely. The two findings share the same logic: the idea that veto players defend the status quo. Gehlbach and Malesky (2010) show, however, that in the presence of special interest groups, the existence of numerous veto players may facilitate reform as well as making reversals less likely. As in Cox and McCubbins (2001), in our model the anti-reform coalition plays the role of a veto player that can block a reform when the pro-reform coalition controls the government. Moreover, the larger the proportion of the anti-reform coalition that must be compensated in order for it to be possible to pass a reform, the less ambitious the reform. Thus, we do not include a separate role for special interest groups as in Gehlbach and Malesky (2010). In our model, the anti-reform coalition is also the player that implements a counter-reform. This does not contradict Keefer and Stasavage (2003) because the anti-reform coalition is not a veto player when it controls the government.⁶

While the literature on veto players and reform employs an essentially static model to study how both reforms and reversals alter the status quo, we develop a fully dynamic model which is capable of generating cycles of reform and counter-reform in equilibrium. In this sense, works that have formally considered the dynamic links between present reforms and future reform outcomes are closer to our model. For example, Dewatripont and Roland (1992) model the impact of dynamic political constraints on optimal economic reforms, and Dewatripont and Roland (1995) show that the sequence of reforms is crucial because each particular reform affects the constituency that supports further reforms. Finally, our modeling strategy draws on dynamic models of institutional change (e.g., Acemoglu and Robinson, 2005).

⁶ Indeed, when the anti-reform coalition is in charge of the government, it is an unrestricted agenda-setter.

The rest of the paper is organized as follows. Section 2 presents the model. Section 3 characterizes the equilibrium of the model. Section 4 deduces the welfare effects of international interventions. Section 5 presents an extension of the model in which the international organization has a choice between funding to promote reforms and funding to avoid reversals. Section 6 concludes.

2 A Simple Model of Reforms

In this section we develop a simple model of reforms. We show that this model can produce different paths of reform depending on the institutional characteristics of the country in question and on the form taken by international interventions. We also explore the welfare implications of those interventions.

Consider a country in which there are two coalitions: the pro-reform group P and the anti-reform group A . The per-period utility function of a member of P is given by:

$$v_t^P = (1 - s_t)\sqrt{r_t}, \quad (1)$$

where $r_t \in [0, 1]$ is a collective decision that we interpret as the extent of a reform and $s_t \in [0, \bar{s}_t]$ is the proportion of the payoff of P used to make transfers to A . The per-period utility function of a member of A is given by:

$$v_t^A = \alpha_0 - \alpha_1 r_t + s_t \sqrt{r_t} + F_t(r_t), \quad (2)$$

where $\alpha_0 > 1$, $\alpha_1 \in [0, 1/2]$ are constants and $F_t(r_t) \geq 0$ is the payment schedule provided by a international agency that promotes reform. Note that excluding transfers v_t^P is increasing in r_t , while v_t^A is decreasing in r_t , i.e., before transfers are made, a higher value of r_t benefits P , but hurts A . Moreover, for $\alpha_1 \in [0, 1/2]$, $v_t^P + v_t^A - F_t(r_t) = \alpha_0 - \alpha_1 r_t + \sqrt{r_t}$ is increasing in r_t , i.e., even without international transfers, a higher value of r_t increases the aggregate payoff. In other words, the reform is socially beneficial. The expected utility of $i = A, P$ is $V^i = \mathbf{E}_t \left\{ \sum_{u=t}^{\infty} \beta^{u-t} v_u^i \right\}$, where $\beta \in (0, 1)$ is the common discount factor and \mathbf{E}_t is the expectation operator taken over the probability distribution of sequences of the form $\{v_u^i\}_{u=t}^{\infty}$.

The political setting is a simple one. At the beginning of each period, one and only one of the coalitions controls the government. For the initial period $t=0$, A controls the government. Whenever a period starts with A in charge, nature determines w_t , an independent identically distributed random variable that adopts only two possible values $w_t \in \{0, 1\}$. We interpret $w_t = 1$ as a window of opportunity for P to make reforms.

Specifically, with probability $p \in (0,1)$, $w_t = 1$, $\bar{s}_t = \bar{s} < 1$, P takes over and selects any (r_t, s_t) provided that $s_t \sqrt{r_t} + F_t(r_t) \geq \gamma \alpha_1 r_t$, where $\gamma \in (0,1)$ is the portion of coalition A that must be compensated in order for it to be possible to pass the reform measure. With probability $(1-p)$, $w_t = 0$, $\bar{s}_t = 0$, A holds power and selects r_t .

Whenever a period starts with P in charge, nature determines c_t , an independent identically distributed random variable that adopts two possible values $c_t \in \{0,1\}$. We interpret $c_t = 1$ as a window of opportunity for A to reverse reforms. Specifically, with probability $q \in (0,1)$, $c_t = 1$ and A has the chance of gaining power. If A decides to do so, both coalitions must pay a cost k , A takes over, $w_t = 0$, $\bar{s}_t = 0$, and A selects r_t . If $c_t = 0$ (which occurs with probability $(1-q)$) or A does not take over, $\bar{s}_t = \bar{s} < 1$, P holds power and selects any (r_t, s_t) provided that $s_t \sqrt{r_t} + F_t(r_t) \geq \gamma \alpha_1 r_t$.

We restrict our analysis to Markov strategies and characterize the perfect Markov equilibrium. A Markov strategy for A is a function $\sigma^A = (\sigma_1^A, \sigma_2^A)$, where $\sigma_1^A : \{(A, w_t = 0)\} \rightarrow [0,1]$ and $\sigma_2^A : \{(P, c_t = 1)\} \rightarrow \{P, A \times [0,1]\}$. A must make a decision under two sets of circumstances. When A is in charge and $w_t = 0$, $\bar{s}_t = 0$, A must select $r_t \in [0,1]$. When P is in charge and $c_t = 1$, A must choose between letting P stay in charge or regaining power, in which case A must select $r_t \in [0,1]$. A Markov strategy for P is a function $\sigma^P = (\sigma_1^P, \sigma_2^P)$, where $\sigma_1^P : \{(A, w_t = 1)\} \rightarrow [0,1][0, \bar{s}]$ and $\sigma_2^P : \{(P, c_t = 0)\} \rightarrow [0,1][0, \bar{s}]$. P must make a decision under two sets of circumstances. When A is in charge and $w_t = 1$, P must select $(r_t, s_t) \in [0,1] \times [0, \bar{s}]$. When P is in charge and $c_t = 0$, P must select $(r_t, s_t) \in [0,1] \times [0, \bar{s}]$.

Let Σ^i be the set of Markov strategies of coalition i , $\sigma = (\sigma^A, \sigma^P)$ a profile of Markov strategies and $\Sigma = \Sigma^A \times \Sigma^P$. Any $\sigma \in \Sigma$ induces a probability distribution over sequences $\{v_t^i\}_{t=0}^\infty$. Let $V^i : \Sigma \rightarrow \mathfrak{R}$ be a function that assigns to every $\sigma \in \Sigma$ the discounted expected utility obtained by group i from the probability distribution over $\{v_t^i\}_{t=0}^\infty$ induced by σ , i.e., $V^i(\sigma) = \mathbf{E}_t \left\{ \sum_{u=t}^\infty \beta^{u-t} v_u^i \right\}$. Summing up, a reform game is a tuple $G = \langle \{A, P\}, (\Sigma^i, V^i)_{i=A, P} \rangle$, where $\{A, P\}$ is the set of players, Σ^i is the set of Markov strategies of player i and $V^i : \Sigma \rightarrow \mathfrak{R}$ is the discounted utility function of player i . Then, a Markov perfect equilibrium of $G = \langle \{A, P\}, (\Sigma^i, V^i)_{i=A, P} \rangle$ is a strategy profile $\sigma = (\sigma^A, \sigma^P)$ such that, for every i , the action indicated by σ^i in every possible circumstance in which i is called into play maximizes i 's expected utility given the strategies of the other players.

3 Equilibrium

In this section we characterize the Markov perfect equilibrium of the reform game when the international agency uses the following schedule: $F_t(r_t) = \delta r_t$ with $\delta < \gamma\alpha_1$. That is, the international agency contributes a portion of the funding that will need to be paid out in order to pass and sustain a reform r_t .

Proposition 1: Equilibrium. *Let $r = \min\{\bar{s}/(\gamma\alpha_1 - \delta)\}^2, 1\}$, $s = \min\{\bar{s}, \gamma\alpha_1 - \delta\}$ and $B = [1 - \beta(1 - p)]^{-1}$. The reform game has a unique Markov perfect equilibrium. In this equilibrium, before the first time $w_t = 1$, A selects $r_t = 0$. Thereafter:*

1. *If $k < \bar{k} = B(1 - \gamma)\alpha_1 r$, then there are reforms and counter-reforms. Whenever $w_t = 1$ or $c_t = 0$, P sets $r_t = r > 0$ and $s_t = s$, while whenever $w_t = 0$ or $c_t = 1$, A sets $r_t = 0$. Moreover, every time $w_t = 1$, there is a reform in period t , while every time $c_t = 0$, reforms are reversed in period t and society pays a cost k .*
2. *If $k \geq \bar{k} = B(1 - \gamma)\alpha_1 r$, then there is an enduring reform the first time $w_t = 1$. In every period $r_t = r > 0$ and $s_t = s$.*

Proof: see Appendix. ■

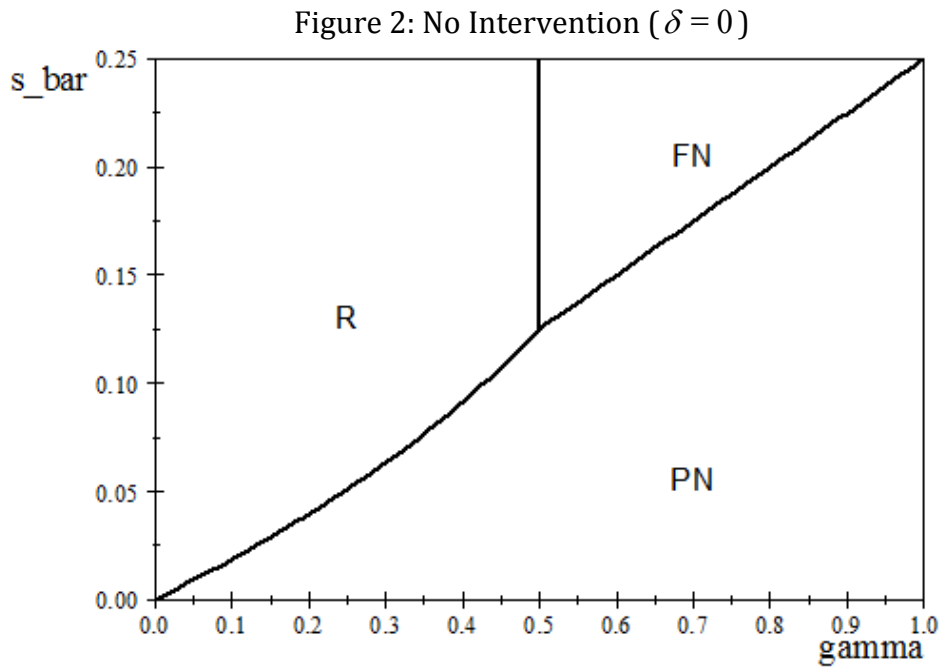
The interpretation of Proposition 1 is straightforward. When the pro-reform coalition controls the government, it passes a reform package. In order to do so, it provides partial compensation to the anti-reform coalition, using its own funds as well as the funds provided by the international agency to do so. When there are enough funds to fully compensate the anti-reform coalition, there is a full-fledged reform. Otherwise, the reform is only partial. Reforms can also either last indefinitely or be short-lived. When $k > \bar{k}$, A finds that it is too costly to reverse the reform and, hence, the reform lasts indefinitely. Conversely, if $k < \bar{k}$, whenever A has the chance, the reform implemented by P is reversed and the country experiences cycles of reform and counter-reform. Thus, Proposition 1 predicts three different reform paths. First a country may undergo a full-fledged, lasting reform. Second, a country may undergo a partial but lasting reform. Third, a country may go through a reform process which is then reversed.

No international intervention. Figure 1 shows the three reform paths for $\delta = 0$, i.e., if there is no international intervention.⁷ When γ and \bar{s} are high (formally, $\bar{s} \geq \gamma\alpha_1$ and

⁷ Figure 1 assumes $\delta = 0$, $\alpha_1 = 1/4$, $B = [1 - \beta(1 - p)]^{-1} = 4$, and $k = 1/2$.

$\gamma \geq 1 - \frac{k}{\alpha_1 B}$), there is a full and permanent reform (region FN in Figure 2). The pro-reform coalition P must compensate a significant proportion of the anti-reform coalition A , but it has the required funds to do so ($\bar{s} \geq \gamma \alpha_1$). Thus, whenever P gains control, a full reform is implemented. The anti-reform coalition A does not have an incentive to reverse the reform because compensations are generous and, hence, it is not worth to incur in reversing costs.

When \bar{s} is low relative to γ (formally $\bar{s} < \min\left\{\gamma \alpha_1, \gamma \alpha_1 \sqrt{\frac{k}{(1-\gamma)B\alpha_1}}\right\}$), there is a partial and permanent reform (region PN in Figure 2). A relative low value of \bar{s} with respect to γ means that funds are not enough to pass a full reform buying off a proportion γ of the anti-reform coalition A . As a consequence, P is forced to pass a more modest reform. Indeed, as \bar{s}/γ decreases, the reform becomes less ambitious (formally, for $\delta = 0$, r is decreasing in \bar{s}/γ). A modest reform could be disappointing for the pro-reform coalition, but it also provide low incentives to reverse it. Finally, if \bar{s} is high relative to γ (formally $\gamma \alpha_1 \sqrt{\frac{k}{(1-\gamma)B\alpha_1}} < \bar{s}$ and $\gamma < 1 - \frac{k}{\alpha_1 B}$), there are reforms and counterreforms (region R in Figure 2). A relative high value of \bar{s} with respect to γ allows for an ambitious reform only compensating a small fraction of the anti-reform coalition A . As a consequence, A has very high incentives to reverse the reforms.



The impact of international intervention. Figure 3 depicts the effects that the availability of

international funds has on reform paths.⁸ Compared with a situation in which there is no intervention, when $\delta > 0$, the region in which there is a full-blown, long-lasting reform is bigger (the difference is indicated by CFN in Figure 3). As the pro-reform coalition P can mobilize external funds ($\delta > 0$) for use in providing compensation to the anti-reform coalition A , it is easier for P to pass a full reform package. When a significant proportion of A must be compensated ($\gamma \geq 1 - \frac{k}{\alpha_1 B}$), reversal is not a problem and, hence, the reform will remain in place indefinitely. However, when only a relatively small proportion of A must be compensated ($\gamma < 1 - \frac{k}{\alpha_1 B}$), the availability of international funds also affects the reversal decision. Indeed, compared with a situation in which there is no intervention, when $\delta > 0$, the region in which there is a reversal is bigger (the difference is indicated by CR in Figure 3). The logic is as follows. When the pro-reform coalition P can mobilize external funds ($\delta > 0$) for use in providing compensation to the anti-reform coalition A , it is easier for P to pass a more ambitious reform. Since only a small portion of A receives compensation, reversal becomes a more attractive alternative.

Figure 3: International intervention ($\delta > 0$)

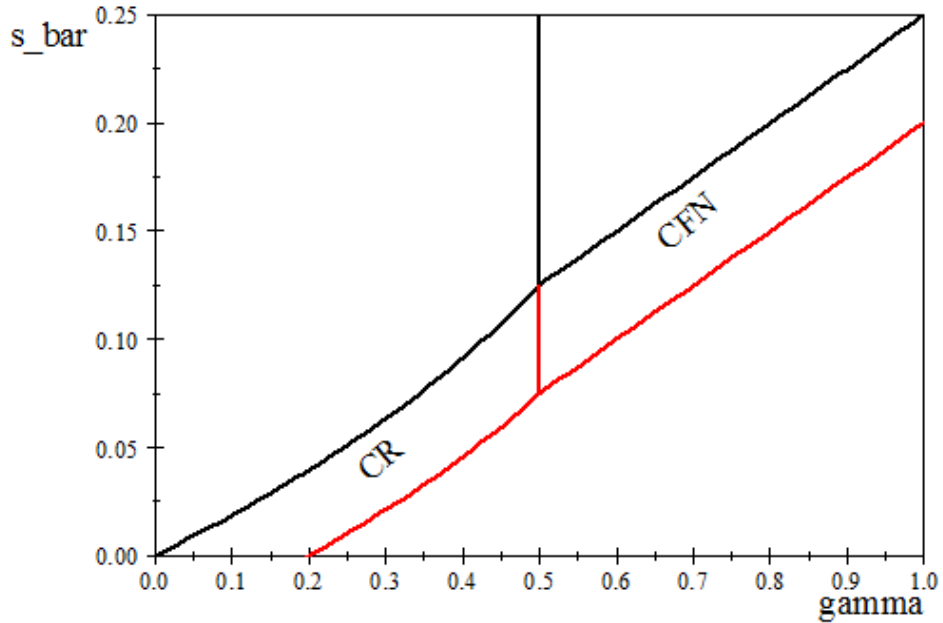


Figure 3 illustrates the trade-off between the extent of the reform and reversals. International funds promote more ambitious reforms, but also increase the chance of reversals. An alternative way of seeing this trade-off is to compute the effect of δ on r and \bar{k} . Formally:

⁸ Figure 2 assumes $\delta = 0.05$, $\alpha_1 = 1/4$, $B = [1 - \beta(1 - p)]^{-1} = 4$, and $k = 1/2$.

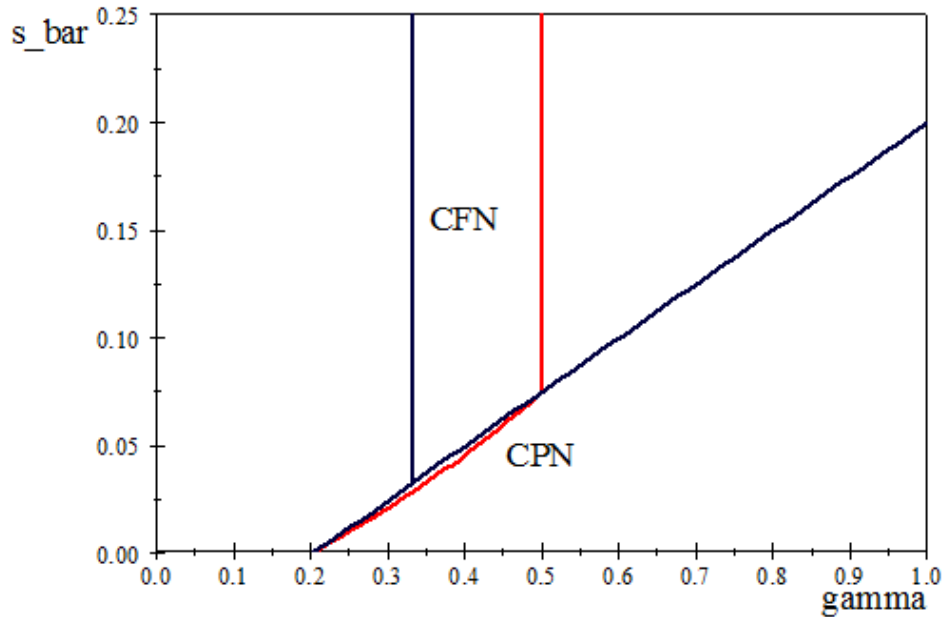
$$\frac{\partial r}{\partial \delta} = \begin{cases} 0 & \text{if } \delta > \gamma\alpha_1 - \bar{s} \\ \frac{2(\bar{s})^2}{(\gamma\alpha_1 - \delta)^3} & \text{if } \delta < \gamma\alpha_1 - \bar{s} \end{cases}$$

$$\frac{\partial \bar{k}}{\partial \delta} = \begin{cases} 0 & \text{if } \delta > \gamma\alpha_1 - \bar{s} \\ \frac{B(1-\gamma)2\alpha_1(\bar{s})^2}{(\gamma\alpha_1 - \delta)^3} & \text{if } \delta < \gamma\alpha_1 - \bar{s} \end{cases}$$

r is increasing in δ for $\delta \leq \gamma\alpha_1 - \bar{s}$ and $r=1$ for $\delta \geq \gamma\alpha_1 - \bar{s}$. As the pro-reform coalition P can mobilize more external funds (δ higher) to compensate the anti-reform coalition A , P is able pass a deeper reform (r higher). When $\delta \geq \gamma\alpha_1 - \bar{s}$, the pro-reform coalition P can amass enough funds to enable it to pass a full-fledged reform. Beyond this point, extra funds do not produce any further reform and the pro-reform coalition simply keeps the difference between available funds and the minimum required compensation to pass a full-fledged reform. \bar{k} is increasing in δ for $\delta \leq \gamma\alpha_1 - \bar{s}$, and beyond that point it does not depend on δ . As the incentives for reform provided by the international agency become more and more generous, the reform package implemented by P becomes more ambitious and, therefore, A becomes more willing to reverse it.

The effect of the cost of reversal. Figure 4 shows the effect of an increase in the cost of reversal. As k increases, the region of full-fledged, lasting reform expands (indicated by CFN in Figure 4), as does the region of partial but lasting reform (indicated by CPN in Figure 4). The logic behind these changes is simple. When the cost of reversing a reform increases, the anti-reform coalition A becomes more willing to accept reform and less willing to start a process of reversal.

Figure 4: The cost of reversal



Summing up, countries in which those who stand to win from a reform must and are able to compensate a significant number of those who stand to lose from it are likely to introduce full-fledged, long-lasting reforms. Countries in which the winners would have to compensate a significant number of the losers, but are unable to do so, will introduce more modest, but stable, reforms. Finally, countries in which the winners are able to pass reform measures without compensating a significant number of the losers will go through cycles of reform and counter-reform. International interventions that promote reforms make reforms more likely, but they also increase the chances of a reversal of those reforms. Increases in the cost of reversal make reversal less likely.

4 Welfare Analysis

In the previous section, we looked at the effects of a international intervention on the equilibrium of the reform game. In this section, we will evaluate the welfare effects of the intervention. In order to do so, we employ the following utilitarian welfare function:

$$W = \mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t (v_t^A + v_t^P - \delta r_t) \right\}$$

Note that we subtract the funds provided by the international agency. In other words, we adopt the perspective of an international agency that can raise funds and use them to help to promote reforms aimed at maximizing social welfare. Proposition 2 summarizes the optimal intervention of such an agency.

Proposition 2: Welfare. *Under the assumptions of Proposition 1, suppose that the international agency selects δ in order to maximize W .*

1. *If $k \geq B(1-\gamma)\alpha_1$, then there is never a reversal. The optimal transfer is $\delta \geq \gamma\alpha_1 - \bar{s}$, which induces full-fledged, lasting reform ($r_t = 1$).*
2. *If $\frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2} \leq k < B(1-\gamma)\alpha_1$, then there are reversals or not, depending on δ .*

Moreover, there exists \hat{k} such that:

(a) *For $k \in [\hat{k}, B(1-\gamma)\alpha_1)$, the optimal transfer is $\delta = \delta_{\max} = \gamma\alpha_1 - \bar{s} \sqrt{\frac{B(1-\gamma)\alpha_1}{k}}$, which induces*

a partial but lasting reform ($r_t = \frac{k}{B(1-\gamma)\alpha_1} < 1$).

(b) *For all $k \in \left[\frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}, \hat{k} \right)$, the optimal transfer is $\delta \geq \gamma\alpha_1 - \bar{s}$, which induces a full-*

fledged reform ($r_t = 1$) and periodic reversals ($r_t = 0$).

3. If $k < \frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}$, then there is always a reversal. The optimal transfer is $\delta \geq \gamma\alpha_1 - \bar{s}$, which induces a full-fledged reform ($r_t = 1$) and periodic reversals ($r_t = 0$).

Proof: see Appendix. ■

The interpretation of Proposition 2 is straightforward. When the international transfers do not affect reversal decisions ($k \geq B(1-\gamma)\alpha_1$ or $k < \frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}$), the optimal policy is to

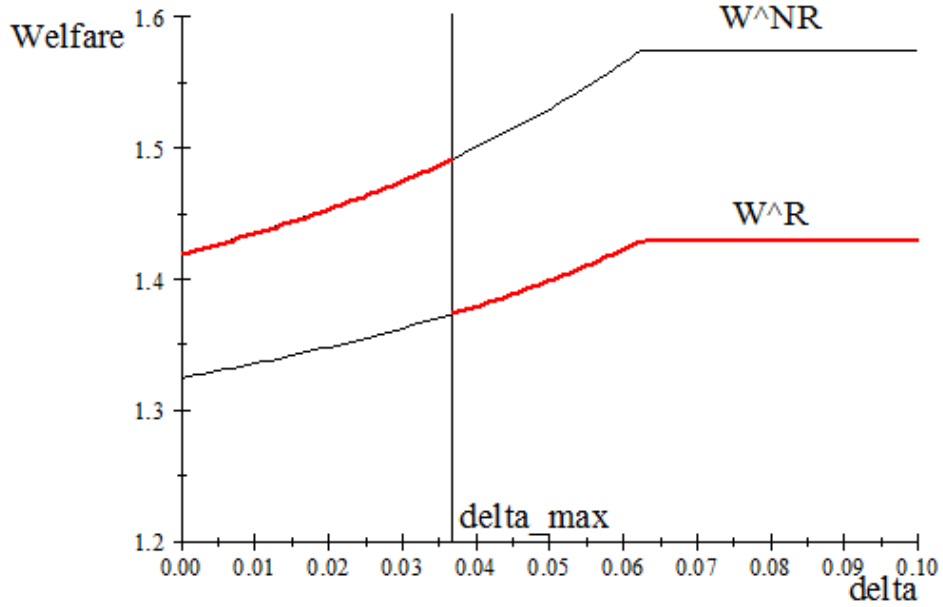
induce a full-fledged reform. If the reform is long-lasting, it will produce a welfare gain in every period, while if the reform is only temporary because there will be a reversal, there will only be a welfare gain in the periods during which the reform survives. In any case, international transfers are not affecting the nature of the equilibrium, since, with or without transfers, there will be the same pattern of reform and counter-reform. International transfers do nothing more than alter the breadth or depth of the reform. On the other hand,

when $\frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2} \leq k < B(1-\gamma)\alpha_1$, international transfers can influence reversal

decisions. As a consequence, it is not always optimal to induce a full-blown reform because this may induce periodic reversals. In particular, if $k \in [\hat{k}, B(1-\gamma)\alpha_1)$, it is better to induce the maximum possible reform that is compatible with no reversal rather than forcing a full-fledged reform that will then be reversed. Figure 5 illustrates this point. Note that for $\delta \leq \delta_{\max}$, the relevant curve is W^{NR} , while for $\delta > \delta_{\max}$, the relevant one is W^R .⁹

⁹ Figure 4 assumes $\alpha_1 = 1/4$, $\gamma = 1/2$, $\beta = 7/8$, $p = 1/7$, $q = 1/7$, $k = 1/4$ and $\bar{s} = 1$. This implies that $\delta_{\max} = \frac{2-\sqrt{2}}{16}$ and the associated maximum extent of reform that does not induce a reversal is given by $r = 1/2$.

Figure 5: Welfare and Reversal 1



Politically myopic international agency. An interesting implication of Proposition 2 is that an international agency that is not fully aware of the possibility of reversals may induce a welfare loss for the country in question. That is, the country may be better off without any intervention than when dealing with a welfare-maximizing but politically myopic international agency. Formally, suppose: $\frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2} \leq k < B(1-\gamma)\alpha_1$. Then, under no intervention, $\delta = 0$, there will be a modest, but lasting, reform and the expected level of welfare will be given by:

$$W^{NR}(\delta = 0, k) = \frac{\alpha_0}{1-\beta} + \frac{\beta p \frac{\bar{s}}{\gamma\alpha_1} \left(1 - \frac{\bar{s}}{\gamma}\right)}{(1-\beta)[1-\beta(1-p)]}$$

If a politically myopic agency offers $\delta \geq \gamma\alpha_1 - \bar{s}$, then there will be a full-fledged reform, but there will also be periodic reversals, and the expected level of welfare will be given by:

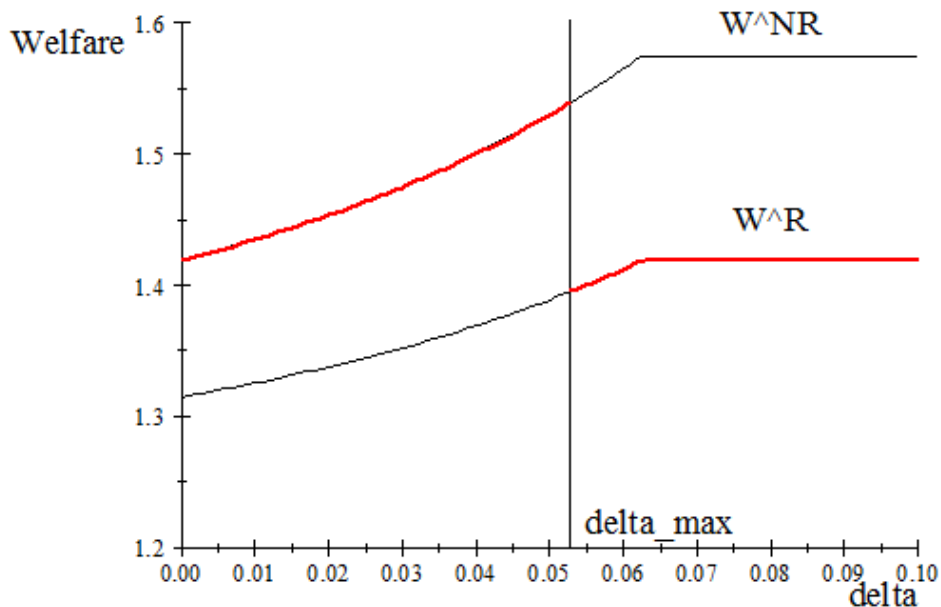
$$W^R(\delta \geq \gamma\alpha_1 - \bar{s}, k) = \frac{\alpha_0}{1-\beta} + \frac{\beta p(1-\alpha_1) - 2\beta^2 p q k}{(1-\beta)[1-\beta(1-p-q)]}$$

Note that $W^{NR}(\delta = 0, k) \geq W^R(\delta \geq \gamma\alpha_1 - \bar{s}, k)$ if and only if:

$$2\beta q k > 1 - \alpha_1 - \frac{[1-\beta(1-p-q)] \frac{\bar{s}}{\gamma\alpha_1} \left(1 - \frac{\bar{s}}{\gamma}\right)}{[1-\beta(1-p)]}$$

Figure 6 illustrates a situation in which no intervention at all produces a higher level of social welfare than a full-blown reform and periodic reversals does.¹⁰ Note also the difference between Figures 5 and 6. In both cases, a myopic international agency will induce too much reform and reversals. In the case of Figure 4, the country will experience a welfare gain relative to a situation of no intervention while, in the case of Figure 6, the country will be better off without any intervention.

Figure 6: Welfare and Reversal 2



Building reversal costs. Another interesting implication of Proposition 2 has to do with the welfare effects of institutional changes that alter the cost of reversals. Under the optimal intervention of a international agency, the expected level of welfare as a function of k is given by:

$$W = \begin{cases} W^{NR} = \frac{\alpha_0}{1-\beta} + \frac{\beta p(1-\alpha_1)}{(1-\beta)[1-\beta(1-p)]} & \text{if } k \geq B(1-\gamma)\alpha_1 \\ W^{NR} = \frac{\alpha_0}{1-\beta} + \frac{\beta p[\sqrt{B(1-\gamma)\alpha_1 k} - \alpha_1 k]}{(1-\beta)B(1-\gamma)\alpha_1[1-\beta(1-p)]} & \text{if } k \in [\hat{k}, B(1-\gamma)\alpha_1] \\ W^R = \frac{\alpha_0}{1-\beta} + \frac{\beta p(1-\alpha_1) - 2\beta^2 p q k}{(1-\beta)[1-\beta(1-p-q)]} & \text{if } k < \hat{k} \end{cases}$$

Note that W is decreasing in k for $k < \hat{k}$, increasing for $k \in [\hat{k}, B(1-\gamma)\alpha_1]$ and that it

¹⁰ The only difference between Figures 5 and 6 is that Figure 5 assumes $k = 1/4$ and Figure 6 assumes $k = 3/8$.

does not depend on k for $k \geq B(1-\gamma)\alpha_1$. Thus, an international agency that is fully aware of the possibility of reversals and the effect of its own policies on the likelihood of reversals will only recommend an institutional change that increases k if the country is able to build reversal costs above \hat{k} .

5 Defending Reforms

In this section we consider the possibility that the international agency helps P to stop a reversal. As in previous sections, the international agency provides incentives to reform δr_t in every period. In addition, when $c_t = 1$, the international agency offers extra incentives ηr_t , provided that P commits to compensate all members of A in the event that there is no takeover. That is, if A does not take office, $\bar{s}_t = \bar{s} < 1$, P holds power and selects any (r_t, s_t, d_t) to maximize $v_t^P = (1-s_t)\sqrt{r_t}$ subject to $s_t\sqrt{r_t} + (\delta + d_t\eta)r_t \geq (\gamma - d_t\gamma + d_t)\alpha_1 r_t$, where $d_t \in \{0,1\}$ ($d_t = 1$ indicates that P accepts the extra funds).

In such an environment, we can compare the following two extreme interventions. Under the first intervention, the international agency sets $\delta = \gamma\alpha_1 - \bar{s}$ and $\eta = 0$, i.e., there are attractive incentives for reform, but there are no extra funds for use in stopping reversals. Under the second intervention, the international agency sets $\delta = 0$ and $\eta = \alpha_1(1-\gamma)$, i.e., there are no incentives for reform, but there are funds that can be used to avert reversals. The following proposition compares the expected levels of welfare associated with these interventions.

Proposition 3 *Suppose that $\frac{C(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2} < k < \frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}$, where $C < B$. Then, the second intervention induces a higher expected level of welfare than the first intervention if and only if:*

$$\frac{\bar{s}}{\gamma\alpha_1} \left(\frac{1-\bar{s}}{\gamma} \right) > \frac{(1-\alpha_1) - 2\beta qk}{1-\beta(1-p-q)}$$

Proof: see Appendix. ■

Proposition 3 suggests that helping countries to avert reversals could be a more valuable contribution to their well-being than promoting reforms would be. This does not necessarily imply that an international agency should not promote reforms at all. It simply establishes that providing funds to help a country deal with a counter-reform cycle may be as valuable as promoting reforms, especially for countries that are prone to reversals.

6 Conclusions

The paths of the structural reform programs that were launched in the 1990s have varied a great deal across countries. We have developed a simple model to try to capture some of the determinants of those paths. We have focused, in particular, on two issues that were overlooked in the early literature on the political economy of reforms: the interaction between domestic institutions and international organizations, and incentives for reversing reforms. In terms of the domestic institutional environment, we have emphasized three features: the ability to mobilize domestic funds for use in compensating losers (\bar{s}), the political strength of the coalition of losers (γ) and the inherent degree of political instability (the pro-reform and anti-reform coalitions chances of controlling the government). International organizations provide funds in exchange for reforms and, hence, affect the balance between the total funds available for compensation of the losers and the proportion of the losers that the government must buy off. This balance influences the extent of the reform package and, hence, the nature of future incentives for reversal.

The model produces the following equilibrium paths. If the pro-reform coalition has to compensate a large portion of the anti-reform coalition and if it has the required funds to do so, the country will undergo a full-fledged, lasting reform process. If the pro-reform coalition has to compensate a large portion of the anti-reform coalition but does not have the necessary funding to do so, then the country will undergo a partial, but still lasting, reform. Finally, if the budget for compensation is large relative to the portion of the anti-reform coalition that must be temporarily co-opted in order for it to be possible to pass a reform, the pro-reform coalition will pass a very ambitious reform package, the immense majority of the anti-reform coalition will be faced with an aggressive reform and receive no compensation and, therefore, as soon as it has the chance, it will initiate a counter-reform process. Thus, the country will be prone to cycles of reform and counter-reform.

We have also proved that international interventions that promote reforms induce an increase in the probability of reversals. Indeed, the countries in which it is easier to promote reforms are countries that do not have sufficient funding to compensate losers, but they also do not have to compensate a large proportion of the losers in order to pass a reform. In other words, these are countries in which ambitious reforms will induce strong incentives to reverse them, unless very high costs of reversal are built up.

A benevolent international agency that is fully aware of the possibility of reversals and the costs associated with them will always increase social welfare. Such an agency should adopt the following approach in order to optimally deal with the trade-off between the extent of the reform and the probability of reversal. Consider only two alternative interventions: provide just enough funding to induce the maximum partial reform that is compatible with no reversal, or provide sufficient funding to induce a full-fledged reform, which could give way to cycles of full-blown reform and complete reversal. Select the intervention that produces greater social welfare. A benevolent but politically myopic agency could have a negative welfare impact if it insists on providing funds that induce an overly aggressive reform that will be followed by an unexpected costly reversal.

Building up high reversal costs could be a way of improving the trade-off between the extent

of a reform and the probability of reversal. The cases of Argentina and Greece indicate that this course of action should be approached with some caution, however. In the case of Argentina, domestically built reversal costs were not enough to avert an almost complete counter-reform. In the case of Greece, international reversal costs proved to be a better barrier to counter-reform, but we should not forget that the generous bailout offered by the European Union was a key incentive for staving off a counter-reform. Indeed, our model suggests that international agencies should consider funding for heading off counter-reform shocks as a valuable tool for defending the reforms that they have helped to put in place.

References

- Acemoglu, Daron, and James A. Robinson (2006), *Economic Origins of Dictatorship and Democracy*, Cambridge, Cambridge University Press.
- Abiad, A.; E. Detragiache and T. Tressel (2008), "Do Financial Reforms Boost the Development of Financial Systems? Evidence from a New Database on Financial Reforms", IMF Working Paper 08/266.
- Abiad, A., and A. Mody (2005), "Financial Reform: What Shakes It? What Shapes It?", *American Economic Review*, 95:88.
- Alesina, A., and A. Drazen (1991), "Why Are Stabilizations Delayed?", *American Economic Review*, 81:5, 1170-1188.
- Cox, Gary W., and Mathew D. McCubbins (2001), "The Institutional Determinants of Economic Policy Outcomes" in *Presidents, Parliaments, and Policy*, Stephan Haggard and Mathew D. McCubbins (eds.), Cambridge: Cambridge University Press, 21-63.
- Drazen, A., and V. Grilli (1993), "The Benefit of Crises for Economic Reforms", *American Economic Review*, 83:3, 5985-5607.
- Dewatripont, Mathias, and Gerard Roland (1992), "Economic Reform and Dynamic Political Constraints", *Review of Economic Studies*, 59:4, 703-730.
- Dewatripont, Mathias, and Gerard Roland (1995), "The Design of Reform Packages Under Uncertainty", *American Economic Review*, 85:5, 1207-1223.
- Fernandez, R., and D. Rodrik (1991), "Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty", *American Economic Review*, 81:5, 1146-1155.
- Galiani, S., Heymann, D. and M. Tommasi (2003) "Great Expectations and Hard Times: The Argentine Convertibility Plan" in *Economia*, 3:2, 109-147.
- Giuliano, P., P. Mishra and A. Spilimbergo (2012), "Democracy and Reforms: Evidence from a New Dataset", IMF Working Paper 10/173.

International Monetary Fund (IMF) (2008), "Structural Reforms and Economic Performance in Advanced and Developing Countries", IMF Occasional Paper.

Keefer, Philip, and David Stasavage (2003), "The Limits of Delegation: Veto Players, Central Bank Independence, and the Credibility of Monetary Policy", *American Political Science Review*, 97:3, 407-423.

Laban, R., and F. Sturzenegger (1994), "Fiscal Conservatism as a Response to the Debt Crisis", *Journal of Development Economics*, 45, 305-324.

Quinn, D. (1997), "The Correlates of Change in International Financial Regulation", *American Political Science Review*, 91:3, 531-551.

Quinn, D., and A.M. Toyoda (2008), "Does Capital Account Liberalization Lead to Growth?", *Review of Financial Studies*, 21:3, 1403-1449.

Rodrik, D. (1994), "The Rush to Free Trade in the Developing World: Why So Late? Why Now? Will It Last?" in *Voting for Reform: Democracy, Political Liberalization and Adjustment*, S. Haggard and S. Webb (eds.), Oxford University Press, New York.

Rodrik, D. (1996), "Understanding Economic Policy Reform", *Journal of Economic Literature*, 34:1, 9-41.

Williamson, J. (1994) (ed.), "The Political Economy of Policy Reform", Institute for International Economics, Washington D.C.

Online Appendix to “International Organizations and Structural Reforms in Developing Countries”

Reform indices - methodology

These indices build on a previous dataset compiled by the research department of the IMF (2008) covering the period 1960-2005 which was analyzed by Giuliano et al. (2012). We have extended the dataset to 2010 using the same methodology and have amended some of the original data after double-checking it with secondary sources. Values have been normalized on a 0-1 scale.

Capital account: Qualitative indicators of constraints on financial credits and personal capital transactions of residents and financial credits to non-residents, as well as the use of multiple exchange rates. The index is coded from zero (fully repressed) to three (fully liberalized). The source for the data is Abiad et al. (2008), following the methodology in Abiad and Mody (2005), based on various IMF reports and working papers, central bank websites and others.

Current account: Current account liberalization is defined using an indicator that describes how compliant a government is with its obligations under Article VIII of the IMF Articles of Agreement to avoid placing government restrictions on international trade in goods and services. The index represents the sum of two subcomponents -- one dealing with restrictions on trade in visibles and the other with restrictions on trade in invisibles (financial and other services). It distinguishes between restrictions on residents (export receipts) and on non-residents (import payments). Although the index measures restrictions on the proceeds from transactions, rather than on the underlying transactions, many countries actually use restrictions on trade proceeds as a type of trade restriction. The index is scored between zero and 8 in half-integer units, with 8 indicating full compliance. Data are constructed based on the methodology set out in Quinn (1997) and Quinn and Toyoda (2007), drawing on information contained in the Fund’s AREAER database (Annual Reports on Exchange Arrangements and Exchange Restrictions).

Proof of Proposition 1. Suppose that A is in charge and $w_t = 0$. Then, $\bar{s}_t = 0$ and A selects r_t in order to maximize $v_t^A = \alpha_0 - \alpha_1 r_t + \delta r_t$. Since $\delta < \alpha_1$, A selects $r_t = 0$ and, hence, $v_t^A = \alpha_0$. Let $V^A(A, w_t)$ denote the value for A when the state is (A, w_t) . Then

$$V^A(A, 0) = \alpha_0 + \beta [pV^A(A, 1) + (1-p)V^A(A, 0)]$$

Suppose that either A is in charge and $w_t = 1$ or P is in charge and $c_t = 0$. Then, $\bar{s}_t = \bar{s}$ and P selects (r_t, s_t) in order to maximize $v_t^P = (1-s_t)\sqrt{r_t}$ subject to $s_t\sqrt{r_t} + \delta r_t \geq \gamma\alpha_1 r_t$. There are two possible cases to consider. If $\bar{s} \in [0, \gamma\alpha_1 - \delta)$, then P selects $s_t = \bar{s}$ and $r_t = [\bar{s}/(\gamma\alpha_1 - \delta)]^2 < 1$. If $\bar{s} \in [\gamma\alpha_1 - \delta, 1/2]$, then P selects $s_t = \gamma\alpha_1 - \delta$ and $r_t = 1$. Hence, $v_t^A = \alpha_0 - (1-\gamma)\alpha_1 r$, where $r = \min\{[\bar{s}/(\gamma\alpha_1 - \delta)]^2, 1\}$. Note that r is an

increasing and strictly convex function of δ for $\delta \leq \gamma\alpha_1 - \bar{s}$ and $r=1$ for $\delta \geq \gamma\alpha_1 - \bar{s}$. Let $V^A(P, c_t)$ denote the value for A when the state is (P, c_t) . Then:

$$V^A(A,1) = V^A(P,0) = \alpha_0 - (1-\gamma)\alpha_1 r + \beta[qV^A(P,1) + (1-q)V^A(P,0)]$$

Suppose that P is in charge and $c_t = 1$. Then A must decide between regaining power or not. Thus:

$$V^A(P,1) = \max\{V^A(P,0), V^A(A,0) - k\}$$

Solving these three Bellman equations, we find that, if A does not regain power, then:

$$\begin{aligned} V^A(A,0) &= \frac{\alpha_0}{1-\beta} - \frac{\beta p(1-\gamma)\alpha_1 r}{[1-\beta(1-p)](1-\beta)} \\ V^A(A,1) = V^A(P,1) = V^A(P,0) &= \frac{\alpha_0 - (1-\gamma)\alpha_1 r}{1-\beta} \end{aligned}$$

while if A regains power, then:

$$\begin{aligned} V^A(A,0) &= \frac{\alpha_0}{1-\beta} - \frac{\beta p[(1-\gamma)\alpha_1 r + \beta qk]}{(1-\beta)[1-\beta(1-p-q)]} \\ V^A(A,1) = V^A(P,0) &= \frac{\alpha_0}{1-\beta} - \frac{[1-\beta(1-p)][(1-\gamma)\alpha_1 r + \beta qk]}{(1-\beta)[1-\beta(1-p-q)]} \\ V^A(P,1) &= V^A(A,0) - k \end{aligned}$$

Comparing $V^A(P,0)$ when A does not regain power with $V^A(A,0) - k$ when A regains power, we can fully characterize the Markov perfect equilibrium. ■

Proof of Proposition 2. We have already computed the expected discounted payoff at time $t=0$ for coalition A ($V^A(A,0) = \mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t v_t^A \right\}$). Next, we compute the expected discounted payoff at time $t=0$ for coalition P ($\mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t v_t^P \right\}$) and the expected discounted payments made by the international agency ($\mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t \delta r_t \right\}$).

Suppose that A is in charge and $w_t = 0$. Then, $\bar{s}_t = 0$, A selects $r_t = 0$ and, hence, $v_t^P = 0$. Let $V^P(A, w_t)$ denote the value for P when the state is (A, w_t) . Then:

$$V^P(A,0) = \beta[pV^P(A,1) + (1-p)V^P(A,0)]$$

Suppose that either A is in charge and $w_t = 1$ or P is in charge and $c_t = 0$. Then,

$\bar{s}_t = \bar{s}$, P selects $r_t = r = \min\left\{\left[\frac{\bar{s}}{\gamma\alpha_1 - \delta}\right]^2, 1\right\}$ and $s_t = s = \min\{\bar{s}, \gamma\alpha_1 - \delta\}$ and, hence, $v_t^P = (1-s)\sqrt{r}$. Let $V^P(P, c_t)$ denote the value for P when the state is (P, c_t) . Then:

$$V^P(A, 1) = V^P(P, 0) = (1-s)\sqrt{r} + \beta[qV^P(P, 1) + (1-q)V^P(P, 0)]$$

Suppose that A does not reverse reforms when P is in charge and $c_t = 1$. Then, $V^P(P, 1) = V^P(P, 0)$ and, solving the Bellman equations, we obtain:

$$V^P(A, 0) = \mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t v_t^P \right\} = \frac{\beta p (1-s)\sqrt{r}}{(1-\beta)[1-\beta(1-p)]}$$

Since there is a reform the first time $w_t = 1$ and, thereafter, international funds will be used in every period, the expected discounted payments of the international agency are given by:

$$\mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t \delta r_t \right\} = \frac{\beta p \delta}{(1-\beta)[1-\beta(1-p)]}$$

Suppose that A reverses reforms when P is in charge and $c_t = 1$. Then, $V^P(P, 1) = V^P(A, 0) - k$ and, solving the Bellman equations, we obtain:

$$V^P(A, 0) = \mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t v_t^P \right\} = \frac{\beta p (1-s)\sqrt{r} - \beta^2 p q k}{(1-\beta)[1-\beta(1-p-q)]}$$

Since there is a reform every time $w_t = 1$ and a counter-reform every time $c_t = 1$, the expected discounted payments of the international agency are given by:

$$\mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t \delta r_t \right\} = \frac{\beta p \delta}{(1-\beta)[1-\beta(1-p-q)]}$$

Summing up, welfare under no reversal is given by:

$$W^{NR} = \frac{\alpha_0}{1-\beta} + \begin{cases} \frac{\beta p (1-\alpha_1)}{(1-\beta)[1-\beta(1-p)]} & \delta \geq \gamma\alpha_1 - \bar{s} \\ \beta p \frac{\bar{s}}{\gamma\alpha_1 - \delta} \left[\frac{1 - \frac{\bar{s}\alpha_1}{\gamma\alpha_1 - \delta}}{(1-\beta)[1-\beta(1-p)]} \right] & \delta \leq \gamma\alpha_1 - \bar{s} \end{cases}$$

while welfare under reversal is given by:

$$W^R = \frac{\alpha_0}{1-\beta} + \begin{cases} \frac{\beta p(1-\alpha_1) - 2\beta^2 p q k}{(1-\beta)[1-\beta(1-p-q)]} & \delta \geq \gamma\alpha_1 - \bar{s} \\ \frac{\beta p \frac{\bar{s}}{\gamma\alpha_1 - \delta} \left[1 - \frac{\bar{s}\alpha_1}{\gamma\alpha_1 - \delta} \right] - 2\beta^2 p q k}{(1-\beta)[1-\beta(1-p-q)]} & \delta \leq \gamma\alpha_1 - \bar{s} \end{cases}$$

The procedure for verifying the following results is therefore straightforward:

- W^{NR} and W^R are increasing in δ for $\delta \leq \gamma\alpha_1 - \bar{s}$, while they do not depend on δ for $\delta > \gamma\alpha_1 - \bar{s}$. When the international agency offers more generous incentives for reforms (δ higher), the country reforms more (r increases). Since $v_t^A + v_t^P - \delta r_t = \alpha_0 - \alpha_1 r_t + \sqrt{r_t}$ is increasing in r_t , a more ambitious reform process increases welfare in the periods in which there is reform. If the increase in δ does not affect the reversal decision, either because there will be no reversal or because there will be a reversal in any case, then a higher δ induces a higher discounted expected level of welfare. When $\delta > \gamma\alpha_1 - \bar{s}$, the country reaches the maximum possible reform and, thereafter, any further increase in δ is just a pure transfer from the international agency to the country, with no effect on outcomes or on welfare.

- W^{NR} and W^R are strictly convex for $0 < \delta < \gamma\alpha_1 - 3\bar{s}\alpha_1$ and strictly concave for $\gamma\alpha_1 - 3\bar{s}\alpha_1 < \delta < \gamma\alpha_1 - \bar{s}$. Although $v_t^A + v_t^P - \delta r_t = \alpha_0 - \alpha_1 r_t + \sqrt{r_t}$ is a strictly concave function of r_t , the reform is a strictly convex function of δ . For low values of δ , the convexity of r_t with respect to δ dominates, while for high values of δ , the concavity of $v_t^A + v_t^P - \delta r_t$ dominates.

- For each δ , $W^{NR} > W^R$ and for $\delta \leq \gamma\alpha_1 - \bar{s}$, $\frac{\partial W^{NR}}{\partial \delta} = \frac{1-\beta(1-p-q)}{1-\beta(1-p)} \frac{\partial W^R}{\partial \delta} > \frac{\partial W^R}{\partial \delta}$. $W^{NR} > W^R$ due to two reasons. First, $v_t^A + v_t^P - \delta r_t$ is increasing in r_t . As a consequence, whenever there is a reversal, there is a reduction in welfare. Second, there are costs associated with a reversal of reforms. For $\delta \leq \gamma\alpha_1 - \bar{s}$, an increase in δ induces a more ambitious reform and, hence, an increase in welfare. The effect is greater when there is no reversal because the reform lasts indefinitely. Figure 5 illustrates W^{NR} and W^R as a function of δ .

Up to this point, we have treated W^{NR} and W^R as if the reversal decision were exogenous. However, from Proposition 1 we know that, in equilibrium, there will be a reversal if and only $k < \bar{k} = B(1-\gamma)\alpha_1 r$. Next, we study the optimal decision of a international agency, whose goal is to select δ in order to maximize $W = \mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t (v_t^A + v_t^P - \delta r_t) \right\}$, taking into account the incentives that the country has to

reverse reforms.

Suppose that $k \geq B(1-\gamma)\alpha_1$. Then, from Proposition 1, in equilibrium, there will be no reversal regardless of the extent of the reform. As a consequence, $W = W^{NR}$, which adopts a maximum for any $\delta \geq \gamma\alpha_1 - \bar{s}$.

Suppose that $k < \frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}$. If $\delta = 0$, then $r = [\bar{s}/(\gamma\alpha_1)]^2$ and, from Proposition 1, in

equilibrium, there will be reversal for any $\delta \geq 0$. As a consequence, $W = W^R$, which adopts a maximum for any $\delta \geq \gamma\alpha_1 - \bar{s}$.

Suppose that $\frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2} \leq k < B(1-\gamma)\alpha_1$. If $\delta = 0$, then $r = [\bar{s}/(\gamma\alpha_1)]^2$ and, from

Proposition 1, in equilibrium, there will be no reversal. Conversely, if $\delta \geq \gamma\alpha_1 - \bar{s}$, then $r = 1$ and, from Proposition 1, in equilibrium, there will be a reversal. Thus, depending on the decision of the international agency, there is a reversal or not. Since W^{NR} and W^R are both increasing functions of δ , the international agency should consider only two possible values of δ . It either selects $\delta \geq \gamma\alpha_1 - \bar{s}$, which induces periodic reversals, with an expected discounted level of welfare given by:

$$W^R(\delta \geq \gamma\alpha_1 - \bar{s}, k) = \frac{\alpha_0}{1-\beta} + \frac{\beta p(1-\alpha_1) - 2\beta^2 p q k}{(1-\beta)[1-\beta(1-p-q)]}$$

or it selects $\delta_{\max} = \gamma\alpha_1 - \bar{s} \sqrt{\frac{B(1-\gamma)\alpha_1}{k}}$, the maximum value of δ that is compatible with no reversal, which induces no reversal and an expected discounted level of welfare that is given by: (for $\frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2} \leq k < B(1-\gamma)\alpha_1$, it is the case that $\delta_{\max} \in [0, \gamma\alpha_1 - \bar{s})$)

$$\begin{aligned} W^{NR}(\delta = \delta_{\max}, k) &= \frac{\alpha_0}{1-\beta} + \frac{\beta p \frac{\bar{s}}{\gamma\alpha_1 - \delta_{\max}} \left[1 - \frac{\bar{s}\alpha_1}{\gamma\alpha_1 - \delta_{\max}} \right]}{(1-\beta)[1-\beta(1-p)]} \\ &= \frac{\alpha_0}{1-\beta} + \frac{\beta p [\sqrt{B(1-\gamma)\alpha_1 k} - \alpha_1 k]}{(1-\beta)B(1-\gamma)\alpha_1 [1-\beta(1-p)]} \end{aligned}$$

It is a simple matter to verify that $W^R(\delta \geq \gamma\alpha_1 - \bar{s}, k)$ is decreasing in k and that $W^{NR}(\delta = \delta_{\max}, k)$ is increasing in k for $\frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2} \leq k < B(1-\gamma)\alpha_1$ and

$W^R\left(\delta \geq \gamma\alpha_1 - \bar{s}, k = \frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}\right) \geq W^{NR}\left(\delta = \delta_{\max}, k = \frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}\right)$. Thus, there exists a unique $\hat{k} \in \left[\frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}, B(1-\gamma)\alpha_1\right]$ such that $W^R(\delta \geq \gamma\alpha_1 - \bar{s}, \hat{k}) = W^{NR}(\delta = \delta_{\max}, \hat{k})$. ■

Proof of Proposition 3. The first intervention is a specific instance derived from Propositions 1 and 2. Assume $k < \frac{B(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}$. Then, $\delta = \gamma\alpha_1 - \bar{s}$ implies that there are reforms and counter-reforms. Whenever $w_t = 1$ or $c_t = 0$, P sets $r_t = 1 > 0$ and $s_t = \bar{s}$, while, whenever $w_t = 0$ or $c_t = 1$, A sets $r_t = 0$. Therefore, under this intervention, the expected discounted level of welfare is given by:

$$W^R(\delta = \gamma\alpha_1 - \bar{s}, \eta = 0) = \frac{\alpha_0}{1-\beta} + \frac{\beta p(1-\alpha_1) - 2\beta^2 p q k}{(1-\beta)[1-\beta(1-p-q)]},$$

while the expected discounted payment by the international agency is:

$$\mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t (\gamma\alpha_1 - \bar{s}) \right\} = \frac{\beta p (\gamma\alpha_1 - \bar{s})}{(1-\beta)[1-\beta(1-p-q)]}.$$

With the second intervention, before the first time $w_t = 1$, A sets $r_t = 0$ and, hence, $v_t^A = \alpha_0$. The first time $w_t = 1$, P takes over and sets $r_t = r = \left(\frac{\bar{s}}{\gamma\alpha_1}\right)^2$ and $s_t = \bar{s}$.

Therefore, $v_t^A = \alpha_0 - (1-\gamma)\alpha_1 r$ and the Bellman equations are:

$$\begin{aligned} V^A(A,0) &= \alpha_0 + \beta [pV^A(A,1) + (1-p)V^A(A,0)] \\ V^A(A,1) &= V^A(P,0) = \alpha_0 - (1-\gamma)\alpha_1 r + \beta [qV^A(P,1) + (1-q)V^A(P,0)] \end{aligned}$$

When $c_t = 1$, if A does not take over, P sets $d_t = 1$, $r_t = r = \left(\frac{\bar{s}}{\gamma\alpha_1}\right)^2$ and $s_t = \bar{s}$.

Thus, $v_t^A = \alpha_0$. If A takes over, then A sets $r_t = 0$ and, hence, $v_t^A = \alpha_0$. Therefore, the Bellman equation is:

$$V^A(P,1) = \max \left\{ \alpha_0 + \beta [qV^A(P,1) + (1-q)V^A(P,0)], V^A(A,0) - k \right\}$$

Solving these Bellman equations, we find that there is no reversal if and only if

$k > \frac{C(1-\gamma)\alpha_1(\bar{s})^2}{(\gamma\alpha_1)^2}$, where $C = \frac{(1-\beta q)[1-\beta(1-p-q)]-\beta p}{(1-\beta)[1-\beta(1-p-q)]+\beta^2 pq} < B$. Supposing that this is the case, then the expected discounted level of welfare under this intervention is given by:

$$W^{NR}(\delta = 0, \eta = \alpha_1(1-\gamma)) = \frac{\alpha_0}{1-\beta} + \frac{\beta p \frac{\bar{s}}{\gamma\alpha_1} \left(1 - \frac{\bar{s}}{\gamma}\right)}{(1-\beta)[1-\beta(1-p)]},$$

while the expected discounted payment by the international agency is:

$$\mathbf{E}_0 \left\{ \sum_{t=0}^{\infty} \beta^t \alpha_1(1-\gamma) \right\} = \frac{\beta^2 pq \alpha_1(1-\gamma) \left(\frac{\bar{s}}{\gamma\alpha_1}\right)^2}{(1-\beta)[1-\beta(1-p)]}$$

A simple comparison between the expected welfare under each intervention completes the proof of Proposition 3. ■