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Reforms and Confidence

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All opinions expressed are those of the authors and do not necessarily reflect the views of the Bank of Finland.

Pertti Haaparanta ja Jukka Pirttilä

Talousuudistukset ja itseluottamus

Tiivistelmä

Tässä tutkimuksessa tarkastellaan talousuudistusten toteuttamista, kun päätöksentekijät kärsivät lyhytnäköisyydestä mutta voivat parantaa itseluottamustaan jättämällä huomiotta osan saatavalla olevasta informaatiosta. Näin he voivat vähentää liiallisesta tulevien hyötyjen aliarvioimisesta aiheutuvia ongelmia. Poliittisten päätöksentekijöiden ja yritysten toimet ovat riippuvaisia toisistaan. Itseensä luottavat poliitikot toteuttavat talousuudistuksia muita poliitikkoja enemmän, jolloin yritysten todennäköisyys investoida kasvaa. Vaikka poliitikot eri maissa voivatkin olla samalla tavoin epärationaalisia, epärationaalisuuden seuraukset eivät ole yhtä vakavia maissa, joissa olosuhteet ovat hyvät. Tarkastelemme myös, miten lyhytnäköisyys vaikuttaa siihen, valitaanko ns. big bang vai gradualistinen uudistusstrategia. Tuloksemme auttavat selittämään maiden välisiä eroja talousuudistusten onnistumisessa.

Asiasanat: talousuudistukset, psykologinen taloustiede, itseluottamus, gradualismi

Reforms and Confidence

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March 21, 2005

Abstract

We examine the choice of economic reforms when policymakers have present-biased preferences and can choose to discard information (maintain confidence) to mitigate distortions from excess discounting. The decisions of policymakers and firms are shown to be interdependent. Confident policymakers carry out welfare-improving reforms more often, which increases the probability that firms will invest in restructuring. While policymakers in different countries can be equally irrational, the consequences of bounded rationality are less severe in economies with beneficial initial conditions. We also examine how present-biased preferences influence the choice between big bang versus gradualist reform strategies. Our findings help explain differences in economic reform success in various countries.

Keywords: Policy reform, behavioural economics, hyperbolic discounting, confidence, gradualism.

1 Introduction

The art of economic policy requires planning, perseverance, and intellect. While the task is demanding, the results are disappointing more often than not. Examples abound of policymakers' troubles in implementing reforms likely to be beneficial. Sometimes it takes a devastating crisis to create acceptance for prudent policies.

This challenging aspect of economic policymaking is well illustrated from the experience of former communist economies in the 1990s. After an initial shock, countries in Central and Eastern Europe (e.g. Poland and Hungary) moved to kickstart growth. In contrast, it took about a decade for most countries in the Former Soviet Union (e.g. Russia and Ukraine) to resume growth.[1] The

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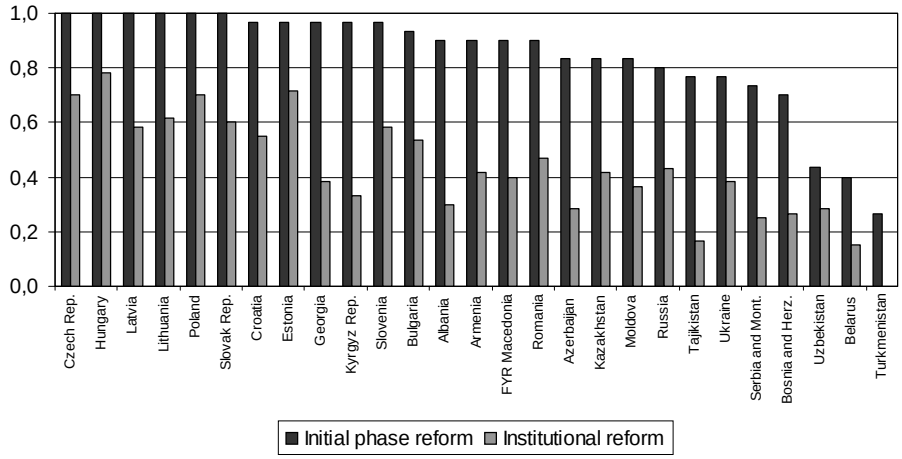
[1] For a survey on empirical analysis of growth in transition economies, see Campos and Coricelli (2002).

result is at economic transition has had widely varying human costs. Successful reformers avoided the drastic increases in mortality, poverty, and inequality seen in countries in the Commonwealth of Independent States (CIS). In Figure 1, we can see almost all transition countries have implemented "first-generation" reforms (i.e. liberalization of prices and trade), but countries in Central and Eastern Europe stand alone in the adoption of broad-based, institution-oriented, "second-generation" reforms.



First and second generation reforms in transition countries, 2003. Source: EBRD.

Why has it been so difficult for CIS countries to adopt second-generation reforms? Certainly their counterparts in Eastern and Central Europe enjoyed more favorable initial conditions, but now, more than a decade since regime change, it is hard to see how such conditions still so effectively constrain policies. One often-mentioned factor – the inevitability of EU membership – is said to have provided a useful policy benchmark for acceding countries. If so, it raises the further question of why such a conditionality is needed. Shouldn't favorable policies justify themselves? In our view, these questions remain largely open.[2]

We approach these questions by considering recent advances in behavioral economics. Research in behavioral economics has uncovered a variety of ways people fail to act as fully rational, expected-utility-maximizing economic agents in real-world decisionmaking (e.g. Royal Swedish Academy of Science, 2002; Camerer and Loewenstein, 2004; and Rabin, 2002). People tend, for example, to care more about changes in utility than absolute levels and discount future

[2] There are, of course, many country experiences that highlight the difficulties of reform policies. We shortly discuss Indian and Latin American cases later in this paper.

in a time-inconsistent way (present-biased preferences). Real people may also value fairness, reciprocity, and care about others (altruism).

Given such less-than-rational decisionmaking, individuals may benefit when an outsider induces them to pursue their best interests. An outsider, for example, could be a government and the inducements could be applied through tax or subsidy policies. From this arises a new kind of market imperfection that calls for a corrective role for the government. This issue has been approached in several recent papers on behavioral public economics, notably O'Donoghue and Rabin (2003), Sheshinski (2003), and Kanbur, Pirttilä and Tuomala (2004).

Here, we push further into this new territory by considering the case where both individuals and the government are susceptible to similar mistakes. Real-world policymakers, after all, are likely to be as fallible as laypersons when deciding about economic reforms (although we would expect them to be better informed about the economic realities affecting reforms). Moreover, policymakers in democracies are dependent on popular support – this is captured directly through median-voter models – and thus they, too, can be committed to less-than-rational decisions. Indeed, it would be rather heroic to maintain that even relatively independent policymakers (such as those in dictatorships) are fully rational and never err.

Specifically, we consider decisions on economic reforms influenced by present-biased preferences, modeled using hyperbolic discounting as in Laibson (1997),[3] where policymakers fail to carry out socially desirable reforms and firms underinvest. Examining reform policy in a dynamic framework is useful, given the time delay between the implementation of reforms and their impact on the economy. Moreover, for a developing or transition country, the uncertainty about the future benefits of reforms can be quite severe. Political instability makes governments in these countries more inclined to focus on the short term than their counterparts in high-income countries, which also suggests that excess discounting could potentially play an important role in development.

Building on the work of Carrillo and Mariotti (2000) and Bénabou and Tirole (2002), we introduce the notion that firms and policymakers can bolster their self-confidence by ignoring disappointing information about their abilities to mitigate distortions from excess discounting. We also show that hyperbolic discounting provides decisionmakers with a justification for policy inaction and delay. Perhaps most importantly, we demonstrate how self-confidence in economic policy by policymakers and economic agents (e.g. investors) may interact and open up the possibility for multiple equilibria. Confident investors and policymakers can support each other to generate a virtuous circle, while non-confident agents, facing similar conditions, lack this dynamic. We finally consider how psychological behavior affects countries with different initial conditions. Countries with favorable initial conditions are more likely to avoid less-than-rational policymaking. This may explain why initial differences can hold long-run consequences for political choices. Outside conditionalities, de-

[3] For a survey that includes a large amount of empirical evidence supporting hyperbolic discounting, see Frederik et al. (2000).

pending on country characteristics, may or may not offer a way to achieve the better equilibrium.

Obviously, there is a substantial and important political economy literature dealing with why seemingly irrational policy choices occur for political reasons. This research is well surveyed by Rodrik (1996) and Drazen (2000), among others, and our aim here is not to provide a competing explanation for policy problems. Rather, we suggest that behavioral economics may well offer complementary insights into analysis of economic reforms.

Our analysis also relates to the discussion on the relative merits between "big bang" and "gradualist" reform strategies in Dewatripont and Roland (1995). In an influential paper, they argue that sequencing of reforms may be superior to big bang reforms when partial reforms reveal information about the consequences of the overall reform package. Their point is that sequencing provides information that allows policymakers to abandon reforms when things go badly. A policy reversal from partial reforms is obviously cheaper than abandoning complete reforms, so sequencing may also be optimal in the face of uncertainty. For Dewatripont and Roland (1995), information always has a positive value. In our model, it is sometimes optimal to discard information. One of our aims, therefore, is to examine the joint effect of these contrasting forces.

The paper is organized as follows. Section 2 presents the foundations of the model and describes behavior of firms. Section 3 considers the interaction between the firms and the policymakers and derives our basic results. Section 4 describes an extension of the model, where policymakers choose between big bang and sequenced (gradualist) reform strategies. Section 5 discusses two real-world cases to illustrate how our theoretical findings may be reconciled with actual country experiences. Section 6 concludes.

2 Firm behavior

We consider the interaction between a policymaker (PM) and firms (or entrepreneurs). The timing is as follows: At period 0, the PM makes an initial reform. Next, the firms learn whether they have a high or low ability to succeed in the reformed environment, θ. Proportion q of the firms receive a bad signal θ_L. We assume that initially the entrepreneurs are unaware of whether their firms have good or bad prospects in the reformed economy, but once reforms commence they obtain information on whether the good they produce faces improving or stagnant markets. Proportion $1-q$ of the firms receive a good signal θ_H. We assume that firms understand the realized value of q and can base their expectations on it if they decide to disregard the signal they have received. The PM, in turn, can observe aggregate productivity, $\widetilde{\theta} = q\theta_L + (1-q)\theta_H$, which allows the PM to deduce the true value of q even if she does not disregard the signal. The agents do not have to use the signals but can ignore them. (Self-) confidence is equivalent to neglecting the information received and behaving according to pre-signal expectations. We assume that the firms and the policymaker decide simultaneously whether to use or discard the signals. This introduces a strategic

element in the formation of confidence crucial for the results in the paper.

During period 1, the PM can introduce further reforms (i.e. continue market-oriented reforms). For simplicity, if the PM moves ahead with a second round of reform, the payoff to firms increases by $\alpha > 1$. If the PM does not proceed with further reforms, payoffs are unaffected. After observing the PM's decision on whether or not to pursue reforms, the firms decide on whether or not to restructure. Note that the PM is a Stackelber leader vis-à-vis the firms. Also, our assumption about timing corresponds to the standard idea that individual agents take the action of the government as a given, while the government can take into account the behavior of agents in its decisionmaking. Payoffs are realized in period 2.

Firms' payoffs and decisions are modeled along the lines of Bénabou and Tirole (2002), where the point is to tie together time-inconsistent preferences and self-confidence. The time-inconsistency of firms' preferences is modeled as follows: When firms restructure during period 1, they incur a cost of c, yielding a profit in period 2. This gives the expected value or effort as seen from period 1:

$$u_1 + \beta\delta E(u_2) = -c + \beta\delta\overline{\theta_i}\alpha V \tag{1}$$

where $i = L, H$, δ is the standard discount factor, β is an additional discount term for all future terms (due to hyperbolic discounting), $\overline{\theta}_i$ is firm i's expected ability in period 1 if it restructures, and V a common return to investment in period 2. Equation (1) follows Bénabou and Tirole, but firms' second-period productivity depends on whether the government continues with reforms. If it does, $\alpha > 1$; otherwise 1. From the point of view of period 0, the payoff is (assuming that the firms' information at the beginning of period 0 is the same as in period 1):

$$u_0 + \beta E_0 \left[\delta u_1 + \delta u_2\right] = u_0 + \beta\delta \left[-c + \delta\overline{\theta_i}\alpha V\right] \tag{2}$$

In comparing (2) and (1), note that a present-biased preference causes firms to restructure less in period 1 than they would have preferred in period 0. In period 1, they restructure if $\overline{\theta_i} > c/\left[\beta\delta\alpha V\right]$, whereas in period 0 it is in their interest to restructure if $\overline{\theta_i} > c/\left[\delta\alpha V\right]$. Note that when $\alpha > 1$, firms will restructure more. If firms do not restructure, they receive a payoff of 0.

We model self-confidence by assuming that firms receive a signal as to their ability to succeed at the beginning of period 1, which they can choose to disregard if they wish. We assume that type H (high-ability) firms always restructure, independent of the PM's actions. Thus, $\theta_H > c/\left[\beta\delta V\right]$.To make the analysis interesting, we also assume that firms will restructure if the PM implements the reform. If firms remain ignorant about their type, they will base their decision on the expected value of $\theta, \overline{\theta}$ (since $\overline{\theta}_i = \overline{\theta}$ for all i because all firms know the realized value of q).[4] Thus, $\overline{\theta} > c/\left[\beta\delta\alpha V\right]$. However, for type L (low-ability)

[4] Note that $\overline{\theta} = \widetilde{\theta}$. We differentiate the notation because from the point of view of the PM $\widetilde{\theta}$ is a random variable if she chooses to ignore the signal she receives while from the point of view of the firm $\overline{\theta}$ is a parameter if it ignores the signal it has received.

firms, $\theta_L < c/[\beta\delta\alpha V]$. Type L firms will restructure only as long as they remain ignorant of their ability. When $\alpha > 1$, however, $\theta_L > c/[\delta\alpha V]$. Thus, in the absence of procrastination and in the presence of continued reforms, the decision of a low-ability firm not to restructure follows from excess discounting and is not optimal ex ante, i.e. from the viewpoint of period 0. If the PM does not implement the reform, high-ability firms will restructure. We assume also that $\bar{\theta} < c/[\beta\delta V]$. This assumption rules out the possibility that an ignorant firm would like to restructure even without any reform. We thus have $c/[\beta\delta\alpha V] < \bar{\theta} < c/[\beta\delta V]$, which holds as the productivity of reforms is large enough, $\alpha > 1$[5]. The following graph illustrates the relation between θ and cutoff levels.

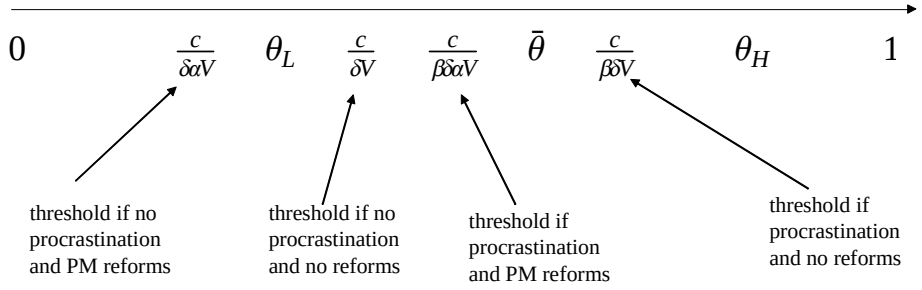


Figure 2: The ordering of payoffs.

We now introduce the possibility that firms can make a decision at period 0 on whether or not to learn their true ability. In other words, firms may discard information about the realization of θ. If they discard information, they base their restructuring decision on $\bar{\theta}$. Following the terminology in Bénabou and Tirole (2002), firms are said to be confident about their ability if they choose to discard information. The following results emerge:

1. As type H firms will always restructure, the decision about confidence is irrelevant.

2. If the PM implements the reform ($\alpha > 1$), discarding information is the optimal approach for type L firms. This helps correct the procrastination-induced mistake that such firms would make if they made their decision based on true θ.

3. If the PM does not carry out the reform, type L firms lose confidence and do not restructure. If they were confident, they would make a wrong decision about restructuring.

[5] The analysis below would go through with a more general formulation: If $\overline{\theta} \leq \frac{c}{\beta\delta\alpha V}$ then even confident L-firms would not invest even if PM carries out the reform, while when $\overline{\theta} > \frac{c}{\beta\delta V}$ even non-confident L-firms would invest without reform. See below.

3 Confidence and policymaking

We may now move to the policymaker's decision. Note that the PM can only observe the aggregate θ. Thus, the PM is assumed to maximize the expected payoff of an average firm. If firms restructure, the PM's objective is to maximize in period 1:

$$-c_{PM} + \beta\delta\widetilde{\theta}\alpha V \tag{3}$$

where $-c_{PM}$ depicts the cost of continuing reforms, including the private cost of effort. In period 0, the objective function is:

$$u_0 + \beta\delta\left[-c_{PM} + \delta\widetilde{\theta}\alpha V\right] \tag{4}$$

If all types of firms restructure, the reform will be carried out in period 1, when $\widetilde{\theta} > c_{PM}/\left[\beta\delta\alpha\right]V$ when the PM knows the aggregate state. The decision to reform depends on the realized value of $\widetilde{\theta}$. The more modern firms (i.e. q falls), the more likely it is that the government will implement further reforms. Similarly, if the values of θ_L and θ_H are both relatively large, the probability of reform increases. Note that the extent of reforms implemented will be less than initially hoped, due to procrastination β in period 1. Thus, excess discounting offers a further justification for policy inaction.

Consider now the possibility of confidence (discarding information) from the PM's viewpoint. Since the realization of $\widetilde{\theta}$ is now a continuous variable as is the probability q, the problem is more complicated than in the firms' case. Let $Q(q)$ denote the distribution function of q with support $\left[\underline{q}, \overline{q}\right]$, so that the distribution function of $\widetilde{\theta}$ is $F\left(\widetilde{\theta}\right) = 1 - Q\left(\frac{\theta_H - \widetilde{\theta}}{\theta_H - \theta_L}\right)$, with $\underline{\theta}_L \leq \widetilde{\theta} \leq \overline{\theta}_H$, where $\underline{\theta}_L = \overline{q}\theta_L + (1-\overline{q})\theta_H$, and $\overline{\theta}_H = \underline{q}\theta_L + \left(1-\underline{q}\right)\theta_H$, with $c/\left[\beta\delta\alpha V\right] \leq \overline{\theta}_L < \overline{\theta}_H \leq c/\left[\beta\delta V\right]$.[6] To make the case interesting, we assume that the expected value of $\widetilde{\theta}$ denoted by $\widetilde{\theta}_E$ is large enough that $\widetilde{\theta}_E > c_{PM}/\beta\delta\alpha V$ holds.[7] We also assume, for simplicity, that $\overline{\theta}_H \geq c_{PM}/\beta\delta\alpha V$ $(\geq\ c/\left[\beta\delta\alpha V\right])$.

Clearly, with the assumptions made above, the benefits of confidence for both the PM and the L-type of firms depend on whether the other party is confident or not. Thus, the value of information to one party depends on the value of information to the other. This strategic aspect of confidence is not considered in Bénabou and Tirole (2002). Hence, it is meaningful to ask whether the state where the PM and the L-type of firms are all confident and the state where they all are confident, are equilibria.

Let us consider first whether (PM confident, L-type of firms confident) is an equilibrium. Consider the deviation by the PM, given that the L-firms are

[6] $P\left\{q\theta_L + (1-q)\theta_H \leq \widetilde{\theta}\right\} = P\left\{q \geq \frac{\theta_H - \widetilde{\theta}}{\theta_H - \theta_L}\right\} = 1 - Q\left(\frac{\theta_H - \widetilde{\theta}}{\theta_H - \theta_L}\right)$. Note, that as will be done, below we can start by assuming a distribution for $\widetilde{\theta}$ which then implies a distribution for q.

[7] Note that $\overline{\theta}$ can differ from $\widetilde{\theta}_E$. The former refers to individual firm's expectation of its ability for the realized value of q if it chooses to disregard the signal it has received. The latter refers to the expected ability among firms after initial reforms calculated by a government that does not know the true value of q.

confident. With previous assumptions, if the PM does not reform, L firms do not reform either. The deviation is not beneficial if the value of information to the PM is negative. Following Bénabou and Tirole (2002), in this case the value of information, $I^{C,C}$, is given by

$$I^{C,C} = G^{C,C} - L^{C,C} = \int_{c_{PM}/\beta\delta\alpha V}^{\overline{\theta}_H} \left[(\delta\alpha\widetilde{\theta}V - c_{PM}) - \left(1 - q\left(\widetilde{\theta}\right)(\delta\theta_H V - c)\right)\right] dF(\widetilde{\theta}) - \\ - \left[(\delta\alpha\widetilde{\theta}_E V - c_{PM}) - \left(1 - q\left(\widetilde{\theta}_E\right)(\delta\theta_H V - c)\right)\right]$$

where

$$G^{C,C} = \int_{\underline{\theta}_L}^{c_{PM}/\delta\alpha V} \left[(c_{PM} - \delta\alpha\widetilde{\theta}V) + \left(\left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right)\right] dF(\widetilde{\theta}) \qquad (5)$$

and

$$L^{C,C} = \int_{c_{PM}/\delta\alpha V}^{c_{PM}/\beta\delta\alpha V} \left[(\delta\alpha\widetilde{\theta}V - c_{PM}) - \left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right] dF(\widetilde{\theta}) \qquad (6)$$

where $q\left(\widetilde{\theta}\right) = \frac{\theta_H - \widetilde{\theta}}{\theta_H - \theta_L}$.[8] Equation (5) depicts the gain from being better informed and (6) the respective loss. The gain comes from moving ahead with reform when the actual value of $\widetilde{\theta}$ is too low to warrant reform benefits. Note that without the reform the H-firms will restructure anyway. The lack of information, however, is related to procrastination. During the interval, when it would be optimal to reform from the ex ante point of view, reforms are put off due to excess discounting in period 1. Note again, that even without reforms, H-firms will restructure. Hence, the gain from reforms must net this out. If

[8] As was noted in footnote 5, the analysis can be carried out for a more general case. In the case outlined there the expected PM utility at time 0, when the decision on the use of information is made, for a PM that decides to use it, even if L-firms are confident, is

$$\int_{\theta_L}^{\frac{c_{PM}}{\delta\alpha V}} \left[\left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right] dF + \\ + \int_{\frac{c_{PM}}{\delta\alpha V}}^{\frac{c_{PM}}{\beta\delta\alpha V}} \left[\left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right] dF + \\ \int_{\frac{c_{PM}}{\beta\delta\alpha V}}^{\theta_H} \left[\delta\widetilde{\theta}\alpha V - c_{PM}\right] dF$$

where we have assumed that $c_{PM} < \alpha c$ and $c_{PM} > \frac{c}{\beta}$. It is straightforward to derive the expression for other cases.

Similarly, the expected PM utility, if the PM remains confident together with confident

sufficient confidence is maintained, ($L^{C,C} > G^{C,C}$), it is optimal for the PM to remain uninformed (i.e. confident) about the realization of economic conditions. We assume that in expected sense the reform is always beneficial from the social point of view, i.e. that $\left[(\delta\alpha\widetilde{\theta}_E V - c_{PM}) - \left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right] > 0$, without this the whole discussion on reforms would not make any sense. Now

$$\left[(\delta\alpha\widetilde{\theta}_E V - c_{PM}) - \left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right] = \tag{7}$$
$$\widetilde{\theta}_E\left[\delta\alpha V - \frac{\delta\theta_H V - c}{\theta_H - \theta_L}\right] + \frac{\theta_L\delta\theta_H(V-c)}{\theta_H - \theta_L} - \left[c_{PM} - \left(1 - q\left(\widetilde{\theta}_E\right)\right)c\right]$$

Thus, $\left[(\delta\alpha\widetilde{\theta}_E V - c_{PM}) - \left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right] > 0$ requires that $\widetilde{\theta}_E \times \left[\delta\alpha V - \frac{\delta\theta_H V - c}{\theta_H - \theta_L}\right] + \frac{\theta_L\delta\theta_H(V-c)}{\theta_H - \theta_L} > 0$ for which a sufficient condition is,

$$\delta\alpha V - \frac{\delta\theta_H V - c}{(\theta_H - \theta_L)} > 0 \tag{A}$$

For high enough degree of time-inconsistency (β small enough), the value of information is negative, since the costs of procrastination are then large. Note also that equations (5) and (6) suggest that higher productivity of reforms reduces the gain from being informed while the loss gets larger.

The value of information to type L-firms, if the PM reforms, must be negative. If the L-type firms get informed they do not restructure and their income

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L-firms, is

$$\int_{\theta_L}^{\frac{c}{\beta\delta\alpha V}} \left\{\left[\left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H\alpha V - c)\right] - c_{PMO}\right\} dF +$$
$$+ \int_{\frac{c}{\beta\delta\alpha V}}^{\frac{c_{PM}}{\delta\alpha V}} \left[\delta\widetilde{\theta}\alpha V - c_{PM}\right] dF + \int_{\frac{c_{PM}}{\delta\alpha V}}^{\frac{c_{PM}}{\beta\delta\alpha V}} \left[\delta\widetilde{\theta}\alpha V - c_{PM}\right] dF +$$
$$\int_{\frac{c_{PM}}{\beta\delta\alpha V}}^{\theta_H} \left[\delta\widetilde{\theta}\alpha V - c_{PM}\right] dF$$

The difference between these two expressions gives the $I^{C,C}$:

$$G^{C,C} =$$
$$\int_{\theta_L}^{\frac{c}{\beta\delta\alpha V}} \left\{c_{PMO} - \delta\theta_H\alpha V + \left[\left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right]\right\} dF +$$
$$\int_{\frac{c}{\beta\delta\alpha V}}^{\frac{c_{PM}}{\delta\alpha V}} \left\{c_{PM} - \delta\widetilde{\theta}\alpha V + \left[\left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right]\right\} dF$$

Here c_{PMO} = the cost of reform when only H firms restructure. Similarly, the loss from information is

$$L^{C,C} =$$
$$\int_{\frac{c_{PM}}{\delta\alpha V}}^{\frac{c_{PM}}{\beta\delta\alpha V}} \left\{\left[\delta\widetilde{\theta}\alpha V - c_{PM}\right] - \left[\left(1 - q\left(\widetilde{\theta}\right)\right)(\delta\theta_H V - c)\right]\right\} dF$$

As can be seen, the analysis can be carried out almost exactly like in the main text.

is 0. If they remain confident, they restructure and their gain, from the point of view of period 0, is positive. Thus, the strategy pair (PM confident, L-firms confident) is an equilibrium if the problem of procrastination is high enough and/or the productivity of reforms is high.

If (PM non-confident, L-firms non-confident) is to be the equilibrium then the value of information to both agents must be positive in it. The value of information to the PM is:

$$I^{NC,NC} = \int_{\underline{\theta}_L}^{\widehat{\theta}} \left[\left(c_{PM,H} - \left(1 - q\left(\widetilde{\theta}\right)\right) \delta\theta_H \alpha V \right) + \left(1 - q\left(\widetilde{\theta}\right)\right) \left(\delta\theta_H V - c\right) \right] dF\left(\widetilde{\theta}\right) - \tag{8}$$

$$- \int_{\widehat{\theta}}^{\widehat{\widehat{\theta}}} \left[\left(\left(1 - q\left(\widetilde{\theta}\right)\right) \delta\theta_H \alpha V - c_{PMO} \right) - \left(1 - q\left(\widetilde{\theta}\right)\right) \left(\delta\theta_H V - c\right) \right] dF\left(\widetilde{\theta}\right) =$$

$$= \int_{\widehat{\widehat{\theta}}}^{\overline{\theta}_H} \left[\left(1 - q\left(\widetilde{\theta}\right)\right) \delta\theta_H \left(\alpha - 1\right) V - \left(c_{PMO} - \left(1 - q\left(\widetilde{\theta}\right)\right) c \right) \right] dF\left(\widetilde{\theta}\right) -$$

$$- \left[\left(1 - q\left(\widetilde{\theta}_E\right)\right) \delta\theta_H \left(\alpha - 1\right) V - \left(c_{PMO} - \left(1 - q\left(\widetilde{\theta}_E\right)\right) c \right) \right]$$

where $\widehat{\theta}$ is the solution to $\left(1 - q\left(\widehat{\theta}\right)\right) \left(\delta\theta_H \alpha V - c\right) - c_{PMO} = 0$, giving the threshold value of the realized aggregate shock above which reform would be profitable from the period 0 point of view, $\widehat{\theta} = \frac{c_{PMO}}{\delta\theta_H \alpha V - c} + \frac{\theta_L}{\theta_H - \theta_L}$. $\widehat{\widehat{\theta}}$ is the solution to $\left(1 - q\left(\widehat{\widehat{\theta}}\right)\right) \left(\beta\delta\theta_H \alpha V - c\right) - c_{PMO} = 0$ giving the threshold value of the aggregate shock above which also an informed PM would reform, $\widehat{\widehat{\theta}} = \frac{c_{PMO}}{\beta\delta\theta_H \alpha V - c} + \frac{\theta_L}{\theta_H - \theta_L}$. c_{PMO} = the cost of reform, excluding the cost to the H firms, to the PM if only H-firms restructure their production. This is positive for sufficiently mild degrees of procrastination.

A single L-firm cannot gain by deviating from the proposed equilibrium. With the assumptions made she will not have any incentive to restructure by becoming confident if the PM has not reformed. Thus (PM non-confident, L-firms non-confident) is an equilibrium if $I^{NC,NC} > 0$, where $I^{NC,NC}$ is obtained from (8).

$I^{NC,NC}$ can be rewritten as[9]

$$I^{NC,NC} = \left\{ c_{PMO} \left[\left(\theta_H - \theta_L\right) - \frac{1}{\beta\delta\theta_H V - c} \right] + \theta_L \left[\left(\alpha - 1\right) \delta\theta_H V - \frac{1}{\left(\theta_H - \theta_L\right)} \right] \right\} F\left(\widehat{\widehat{\theta}}\right) \tag{9}$$

$$+ \left(\frac{\left(\alpha - 1\right) \delta\theta_H V}{\left(\theta_H - \theta_L\right)} \right) \int_{\underline{\theta}_L}^{\widehat{\widehat{\theta}}} F\left(\widetilde{\theta}\right) d\widetilde{\theta}$$

(9) implies that for any given degree of time-inconsistency there exists values of θ_H and θ_L such that $\left(\theta_H - \theta_L\right)$ is large enough to make $I^{NC,NC} > 0$ and

[9] Equation (9) follows from utilizing the definition of expected value, integrating by parts, and rearranging.

non-confidence by the PM the best response to non-confidence by the L-firms. Analogously, $I^{C,C}$ can be written as

$$I^{C,C} = \left\{ c_{PM} \left[1 - \frac{1}{\beta} \left(1 - \frac{\delta\theta_H V - c}{\delta\alpha V \left(\theta_H - \theta_L \right)} \right) \right] - \frac{\theta_L}{\left(\theta_H - \theta_L \right)} \left(\delta\theta_H V - c \right) \right\} F \left(\frac{c_{PM}}{\beta\delta\alpha V} \right) \tag{10}$$

$$+ \left[\delta\alpha V - \frac{\delta\theta_H V - c}{\left(\theta_H - \theta_L \right)} \right] \int_{\underline{\theta}_L}^{\frac{c_{PM}}{\beta\delta\alpha V}} F\left(\widetilde{\theta} \right) d\widetilde{\theta}$$

Thus, $I^{C,C} < 0$ (remembering assumption (A)) for a sufficiently high degree of time inconsistency also when $(\theta_H - \theta_L)$ is large. The following result immediately emerges:

Proposition 1 *If the PM is confident, it is optimal for low-ability firms to choose to be confident as well. Thus, assuming (A) there exists a high enough degree of time inconsistency such that all firms restructure, and the economy ends up at a "good" equilibrium. If reforms are not conducted, low-ability firms are not confident, and the economy can end up at a "bad" equilibrium for parameter values under which also the "good" equilibrium exists.*

Proof. Follows directly from the discussion preceeding the proposition. ■

The result shows that remaining confident can help to solve problems arising from partly irrational behavior (excess discounting). A multiple equilibria situation arises, where confidence or the lack thereof is a determining factor for which equilibrium is selected. This result, we believe, has wider applicability beyond our chosen modeling framework. It allows for rigorously modeling of the "spirit of reform" that can affect behavior and economic outcomes.

Usually confidence is thought to matter when there exist multiple equilibria in the economy that can be ranked in welfare terms. The problem of identifying the role of confidence in this manner is that confidence is external to the economy. Here, the problem is how to coordinate agents' actions so that the best equilibrium is reached and general confidence plays a role as a coordinating device. Thus, we have built a model of mutual confidence that is internal to the economy, i.e. agents make choices that affect their confidence. Our result also implies that confidence-building may create multiplicity problems of its own. For example, one can image cases where confidence-building on one side is beneficial if, and only if, confidence is also built on the other side.

Policy conditionality, imposed from outside, may help countries that otherwise lack confidence gather reform momentum. But it is clear that outside conditionality is not necessarily beneficial.

Proposition 2 *An unwavering commitment to reform is welfare-enhancing when the expected productivity is at an intermediate level, $c_{PM}/\delta\widetilde{\theta}V < \alpha < c_{PM}/\beta\delta\widetilde{\theta}V$, but undesirable when the expected productivity is low, $\alpha < c_{PM}/\delta\widetilde{\theta}V$.*

This apparently straightforward result is, in fact, quite remarkable upon reflection. Many observers have noted that the strong policy conditionality imposed by the future EU accession has been a driving force for reforms in the

accession countries, whereas reform in the CIS countries has been more hesitant because of a lack of conditionality. The result, however, suggests that an outside policy conditionality is only helpful when the country has intermediate initial conditions. With excellent initial conditions, of course, the conditionality is irrelevant as reforms would be chosen anyway. For countries with lousy initial conditions, reforms may offer no benefit and therefore they endogenously choose not to commit. These remarks put into question the influence attributed influence to outside policy conditionalities in promoting reform.

The decision whether to remain confident depends on economic conditions. Consider two PMs with similar preferences confronted with the need to decide policy. For one, the expected value of $\widetilde{\theta}$ is higher than for the other. We denote this with the notation $\widetilde{\theta}_E^G > \widetilde{\theta}_E^B$. Both are assumed to be higher than the cutoff level for implementing reforms. We can interpret this situation as two countries with different initial conditions for reform. Which PM is more likely to remain confident? It can be shown that

Proposition 3 *Assume* (A) *and* $\frac{1}{\beta}\left(1-\frac{\delta\theta_H V-c}{\delta\alpha V(\theta_H-\theta_L)}\right)-1+\frac{\theta_L}{(\theta_H-\theta_L)}\left(\delta\theta_H V-c\right)$ >0*. Then the PM in the economy with better initial conditions* $(\widetilde{\theta}_E^G)$ *is more likely to be confident than the PM in the country with worse initial conditions* $(\widetilde{\theta}_E^B)$*.*

Proof. Following again Bénabou and Tirole (2002), we assume that the good distribution, $G(\widetilde{\theta})$, stochastically dominates the bad distribution, $B(\widetilde{\theta})$. Let $g(\widetilde{\theta})$ and $b(\widetilde{\theta})$ denote the densities of the two distributions. In this case, G stochastically dominates B when the likelihood ratio $g(\widetilde{\theta})/b(\widetilde{\theta})$ increases in $\widetilde{\theta}$. This condition is known as the monotone likelihood ratio property (MLRP). From (10):

$$I^{C,C} \lesseqgtr 0 \Longleftrightarrow \tag{11}$$

$$\delta\alpha V\left(1-\frac{\delta\theta_H V-c}{\delta\alpha V\left(\theta_H-\theta_L\right)}\right)\int_{\underline{\theta}_L}^{c_{PM}/\beta\delta\alpha V}\frac{F(\widetilde{\theta})}{F(c_{PM}/\beta\delta\alpha V)}d\widetilde{\theta}-$$

$$\left[\frac{1}{\beta}\left(1-\frac{\delta\theta_H V-c}{\delta\alpha V\left(\theta_H-\theta_L\right)}\right)-1+\frac{\theta_L}{(\theta_H-\theta_L)}\left(\delta\theta_H V-c\right)\right]c_{PM}\lesseqgtr 0$$

The term $\frac{F(\widetilde{\theta})}{F(c_{PM}/\beta\delta\alpha V)}$ is smaller for $\frac{G(\widetilde{\theta})}{G(c/\beta\delta\alpha V)}$ than for $\frac{B(\widetilde{\theta})}{B(c/\beta\delta\alpha V)}$ by the MLRP, for any $\widetilde{\theta}\leq c_{PM}/\beta\delta\alpha V$. This means that the value of being informed is higher for the economy with bad initial conditions. The PM facing better initial conditions is likely to remain more confident. ■

The intuition for this result is that the PM facing better initial conditions has more to lose from irrational behavior and finds it more valuable to remain confident. The result implies an interesting interaction between initial conditions and confidence. Good initial conditions not only raise the benefit of reforms *per se*,

but they also help build confidence and therefore overcome problems related to non-rational decisionmaking at both firm and government levels. Countries with better initial conditions therefore appear to suffer less from less-than-optimal decisionmaking. This result may help explain why bad initial conditions can have a long-lasting effect on economic performance of countries. In countries where confidence is lost, reforms that would have been beneficial are simply not undertaken.

Similarly, it is worthwhile to examine how an increase in uncertainty affects confidence. We illustrate this case by again considering two policymakers, one facing distribution $S(\widetilde{\theta})$ and the other distribution $R(\widetilde{\theta})$. For both policymakers, the expected value of the productivity in the economy is the same, $\widetilde{\theta}$, but the standard deviation of the safe distribution (S) is smaller than the standard deviation of the risky distribution R.[10] In other words, we consider the effects of mean-preserving spread from S to R.

Proposition 4 *A PM in the higher risk environment is more likely to be confident than a PM in the lower risk environment.*

Proof. Consider again equation (12). The numerators of $\frac{F(\widetilde{\theta})}{F(c_{PM}/\beta\delta\alpha V)}$ for $\frac{S(\widetilde{\theta})}{S(c/\beta\delta\alpha V)}$ and for $\frac{R(\widetilde{\theta})}{R(c/\beta\delta\alpha V)}$ are the same by definition, whereas $S(c/\beta\delta\alpha V) < R(c/\beta\delta\alpha V)$. The value of information is less in a riskier environment, and the policymakers in risky environments are more likely to be confident. ■

The riskier the situation, the higher the potential benefits from confidence, so the expected gain from confidence increases. This is also intuitively appealing. When there is substantial uncertainty, the beliefs of policymakers matter are given greater emphasis. Similarly, in the absence of uncertainty, the issue of confidence does not arise. An example might be Great Britain in 1979, when Margaret Thatcher became prime minister. At that time Britain had problems with its external balance, production was stagnant and labor markets were in a state of unrest. Nevertheless, many reforms were undertaken. Despite initial poor macroeconomic outcomes, further reforms were pushed through.

4 Partial versus full reforms

This notion of confidence and reforms could be used to shed some new light on the discussion of sequencing policy reforms or the discussion between shock therapy and gradualism. In their influential paper, Dewatripont and Roland (1995) argue that sequencing of reforms may be superior to big bang reforms when partial reforms reveal information about the consequences of the whole reform package. Their point is that sequencing provides information that allows policymakers to abandon reforms when things go badly. Since a policy reversal with partial reforms is cheaper than with complete reforms, sequencing can be optimal under uncertainty.

[10] Note that the support of the distribution is not changed.

This section combines our discussion so far with the analysis of Dewatripont and Roland (1995). Consider a case with two reforms, R_1 and R_2. The policymaker can adopt two reform strategies. Under a big bang or full reform strategy, the PM implements both reforms immediately in period 0. In principle, she can reverse both reforms, but for no loss of generality it is assumed that reversing a full reform is prohibitively costly.[11] In a partial or gradual reform, the PM first implements R_1. Following the first reform, the PM receives information on the aggregate profitability of the economy and the expected benefits of implementing R_2. If the information received reveals a highly unproductive economy, the PM can reverse the first reform in period 1 at a cost of ξ. In principle, she can decide to do nothing. In this case, the economy ends up partially reformed. Following Dewatripont and Roland, we assume that a continuous situation of partial reform is always dominated either by reversion to the original situation or pushing through to full reform. Therefore, the other viable option for the PM during period 1 is to go ahead with implementation of the second reform, R_2.

Note that the big bang strategy is analogous to staying confident. The gist is that information that is available later is not used in the decision about the reforms. The gradual strategy, in turn, is equal to the case where further information is acquired. The point of this section is just to show this equivalence rigorously.

The firms' payoff functions are changed as follows. In period 0, firms enjoy a profit level $\alpha\pi$,where $\alpha > 1$ when the PM implements both reforms, and $\alpha = 1$ otherwise. This assumption captures the idea that a full reform leads in principle to a more efficient outcome than a partial reform. During period 1, after uncertainty is realized, the firm's profit depends on θ and is given by $\Pi(\alpha)\theta$, with $\Pi_\alpha > 0$ and $\Pi_\theta > 0$. In addition, if the firm decides to invest, it incurs a cost of $-c$. In period 2, the firm operates only if it has invested. Here, its profit are given by $V(\alpha)\theta$,with $V_\alpha > 0$ and $V_\theta > 0$. For simplicity we assume in this action away all the strategic interactions between the firms and the PM: both types of firms invest if the reform R_2 has been implemented, and they do not invest, if it is not implemented.

Consider the PM payoff functions. In the big bang case, only period 0 utility matters for decisionmaking. If all firms invest, this is given by

$$BB = \alpha\pi - c_{BB} + \beta\delta\left[\Pi(\alpha)\widetilde{\theta}_E + \delta V(\alpha)\widetilde{\theta}_E\right], \tag{12}$$

where c_{BB} is the cost for the PM (including the private costs of investment discounted to period 0) for implementing a big bang strategy. In the gradual strategy, the PM reverses the reform if the cost of continuing with additional reforms is too high, i.e. if the state turns out to be bad enough:

[11] It is probably the case that once complete civic and economic liberties are implemented, it becomes impossible to return to the old regime.

$$\begin{aligned} \beta\delta V(\alpha)\theta + \xi &\leq c_{GR} \Leftrightarrow \theta \leq \overleftarrow{\theta}, \\ \overleftarrow{\theta} &= \frac{c_{GR} - \xi}{\beta\delta V(\alpha)} \end{aligned} \tag{13}$$

where c_{GR} refers to the cost related to gradual reform. We define $\overleftarrow{\theta}$ as the cutoff value for making it optimal to reverse reform 1 and not to carry out the second reform. It is determined by the requirement that the return from the reform (firm income and the saving of cost of reversal) is equal to the cost of reform. In this case, the period 0 utility for PM in the gradualist case is

$$GR = \pi + \beta\delta \left[\int_{\underline{\theta}_L}^{\overleftarrow{\theta}} \Pi(1)\theta dF + \int_{\overleftarrow{\theta}}^{\overline{\theta}_H} \Pi(\alpha)\theta dF + \int_{0}^{\overleftarrow{\theta}} -\xi dF + \int_{\overleftarrow{\theta}}^{\overline{\theta}_H} \left[\delta V(\alpha,\theta) - c_{GR}\right] dF \right] \tag{14}$$

Now consider the relative merit of gradualism versus big bang. Comparing (12) and (14), we see that

$$\begin{aligned} BB - GR = (\alpha - 1) &+ \beta\delta \left[\int_{\underline{\theta}_L}^{\overleftarrow{\theta}} \left[\Pi(\alpha) - \Pi(1)\right] \widetilde{\theta} dF \right] \\ &- \beta\delta \int_{\underline{\theta}_L}^{\underrightarrow{\theta}} \left[\frac{c_{BB}}{\beta\delta} + c_{GR} - \xi - \delta V(\alpha)\theta \right] dF \\ &- \beta\delta \int_{\widehat{\theta}}^{\overleftarrow{\theta}} \left[\frac{c_{BB}}{\beta\delta} + c_{GR} - \xi - \delta V(\alpha)\widetilde{\theta} \right] dF \\ &- \int_{\overleftarrow{\theta}}^{\overline{\theta}_H} \frac{c_{BB}}{\beta\delta} dF + \beta\delta c_{GR} \end{aligned} \tag{15}$$

$\underrightarrow{\theta}$ is defined by the condition $\underrightarrow{\theta} = \frac{c_{GR} - \xi}{\delta V(\alpha)}$. The first and second terms at the right of (15) are positive. Following Dewatripont and Roland, they capture the "interim suffering" related to gradualism. The payoffs at periods 0 and 1 are lower under gradualism when the full reform has yet to be implemented. The third term captures the fact that for a sufficiently bad information it is beneficial to reverse the reform. It is negative by definition: when θ is below $\underrightarrow{\theta}$, it is optimal to reverse the reform. This "option value of early reversal," unavailable in full reform strategy, is the key value-added from gradualism as emphasized by Dewatripont and Roland. The fourth term captures the gains

from confidence related to big bang reforms: big bang reform allows the PM to tie her hands and to avoid the continuation of the reform policy just because of procrastination and time-inconsistency: $c_{GR} - \xi - \delta V(\alpha)\theta > 0$ for $\underrightarrow{\theta} < \widetilde{\theta} < \overleftarrow{\theta}$. This reduces the cost of the big bang reform. The last term just captures the gain from the big bang reform of avoiding the cost of the gradual reform against the loss of incurring the cost even when the gradual strategy would have implemented the whole reform package.

In sum, the question on the optimality of sequential reform strategy is a balance between the possibility for early reversal of reforms when economic conditions are not fruitful for reforms and avoiding a short-sighted reform policy when future benefits are over-discounted through the hyperbolic discount function.

If the cost of reversal, ξ , is so high that $\overleftarrow{\theta} \leq 0$, then obviously the optimal gradual policy is to implement the reform in all cases. The difference between the two reform types vanishes in this case. On the other hand, if the productivity falls below $\underrightarrow{\theta}$ then it may be optimal to reverse the reform even if the PM is not short-sighted. Thus

Proposition 5 *If aggregate productivity falls below a threshold value, $\underrightarrow{\theta}$, it may be optimal to reverse reform 1. The existence of the reversal possibility tends to increase the value of being informed, i.e. the relative merit of the gradualist over big bang approach, as it may mitigate the loss from procrastination.*

The analysis can be extended to take into account the strategic decisions of firms. The basic conclusions would, howver, remain unchanged.

5 Country experiences

The Indian economy in recent years has expanded at rates approaching Chinese growth rates. This is usually explained by the economic policy reforms undertaken in the early 1990s that deregulated markets and reduced substantially trade barriers (even though they are still quite high) (see e.g. *The Economist*, February, 2004). What is overlooked is that Indian growth already took off in the early 1980s, a decade before any reforms were implemented or even planned (Rodrik and Subramanian 2004). One explanation could be based on the assumption of rational expectations, to wit, in the early 1980s firms were for some reason able to anticipate policies would change in ten years and so began to renew their production facilities to be able to utilize markets after deregulation. This certainly explains the increased investment and the growth rate, but does nothing to elucidate why would firms change their expectations out of blue. Were Indian firms so clever that they foresaw the prevailing policies could not be continued? Rodrik and Subramanian propose an alternative explanation, suggesting that a change of mood in government manifested as a friendlier attitude towards firms even as policies were kept intact. When firms noted the change and then realized after a while that the change was lasting, they began

to expect changes in policy in addition to that existing regulations were implemented in ways that were less disruptive for firms. What we are doing here could be interpreted as a partial formalization of this Indian experience as described by Rodrik and Subramanian. This formalization helps explain conditions for mutual confidence to arise and their importance for implementing reforms as planned.

Another illustrative example is related to the Latin American experience. Many of these countries undertook serious structural reforms in the 1980s and 1990s. The bulk of the reforms took place in 1989–1994. Despite the reform efforts that followed the Washington Consensus, the results in terms of economic growth have been modest and temporary – to an extent that the 1990s has been called a lost decade for the Latin America (Lora and Panizza 2002). At the same time, the popular support for reforms decreased. Lora, Panizza and Quispe-Agnoli (2004) ponder the reasons behind this reform fatigue. They argue that, in addition to discouraging impacts of reforms on growth, psychological factors have reduced confidence in the economic benefits of reforms. With less confidence in reforms, the likelihood of implementing future reforms decreases.

6 Conclusions

This paper examined decisions on economic reforms, building on lessons from behavioral economics. This approach serves as a complementary tool to the well-established political economy literature in understanding reform difficulties. In particular, we concentrated on excess discounting, which can be important because of the long time dimension of many structural reforms, as well as the possibility of building confidence by discarding information to mitigate harmful effects from excess discounting.

Our analysis demonstrated that the decisions designed to build confidence or instill a "spirit of reform" on the part of the government can interact with the decisions of economic agents (firms in our case), opening up an interesting possibility of multiple equilibria. Confident policymakers are more likely to carry out welfare-improving reforms, which increases the probability that firms will invest in restructuring, while this dynamism is lacking in non-confident environments. While policymakers in different countries can be equally irrational, the consequences of bounded rationality are less severe in economies with good initial conditions. The influence of confidence was also shown to matter more when future benefits of reforms are less certain. Finally, if reforms can be reversed, the value of being informed, i.e. the relative merit of a gradualist approach over a big bang reform, tends to increase as the possibility for the reversal may mitigate the loss from excess discounting.

These results can be referenced to actual country experiences in India, Latin America, and former socialist countries. In all these cases, "hard" economic decisions have been influenced by beliefs about the chances for reform success. While this analysis only offered small steps towards understanding factors behind successful reforms, we see wide potential for further investigation in this

area of behavioral development economics.

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