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Globalization and the 'Confidence Game'

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1 Introduction

The globalization of international capital markets in recent years, is believed to have the potential to discipline governments in developing countries. This is because it is perceived that in order to *attract* foreign capital, governments have to pursue ‘sound’ economic policies in order to boost ‘market confidence’.¹ While this view seems quite plausible, the recent spate of currency crises seems to suggest that the ‘disciplining’ role of the international capital market has at the very least, not been very effective.

In a perceptive commentary Krugman(1998, 1999) suggests a potential reason. He argues that inefficiencies might arise because policy makers in the global economy feel compelled to play the ‘confidence game’ - where the preoccupation of policymakers is not with economic fundamentals but with winning market confidence. There is a temptation to implement “...policies that may not make sense in and of themselves but that policymakers believe will appeal to the prejudices of investors...In fact the need to win that confidence can actually prevent a country from following otherwise sensible policies and force it to follow policies that would normally seem perverse.” This opinion has been echoed by Bhagwati(1998) and Rodrik(1998) who also conjecture that globalization and the free flow of capital has resulted in developing countries feeling ‘compelled’ to enact policies that may be inappropriate. This is somewhat easier to understand if there is a fundamental dissonance between the developmental goals of a country and the interests of foreign investors.² It is more puzzling once we recognize that both - a productive economic environment and increased foreign capital, raise national income. However, in this paper we argue that once we take account of the *signaling*

¹There is an excellent informal discussion of some of the issues involved in Krugman(1999) as well as Rodrik(1999).

²Rodrik(1998) argues that the free flow of capital can make policy making in “..‘emerging market’ countries hostage to the whims and fancies of two dozen or so thirty-something country analysts in London, Frankfurt and New York. A finance minister whose top priority is to keep foreign investors happy will be one who pays less attention to developmental goals”.

aspect of policy choice, the desire to attract foreign capital rather than ‘discipline’ governments, generates perverse incentives for policy makers and results in inefficient outcomes.³ In that sense this paper provides an analytical underpinning to the opinions voiced by Krugman, Bhagwati and Rodrik in recent years, that globalization and the free flow of capital might generate perverse incentives for governments in developing countries.

Let us begin by delineating the key features of our analysis. Take the case of a developing country that wants to boost national income by attracting foreign capital. The government enacts a policy, which through its impact on the quality of the economic environment, affects the returns to foreign investment. In particular, we assume that different policies are ‘appropriate’ for different states of the world - no policy is intrinsically superior to the other. So if there exist two states of the world - which for concreteness let us just label them as ‘orthodox’ or ‘heterodox’.Corresponding to each of these states there is an appropriate policy - ‘conservative’ or ‘liberal’. Therefore, if a ‘conservative’(liberal) policy is correctly matched to an ‘orthodox’(heterodox) state of the world, the returns to investment and output are high.⁴ What makes the process of matching a policy with the appropriate state difficult is that the true state of the world is unknown. However, before it makes its policy choice, the government receives private information about the state of the world.

In the framework described above, we show that governmental decision making in open economies suffers from inefficiencies. In particular, we argue that, the very attempt to maintain ‘market confidence’, might result in governments choosing a policy, even though it might

³Our analysis also helps throw light on the alleged ‘failure’ of economic policies in stemming the South East Asian crisis. See Radelet and Sachs(1998) and Wade and Veneroso(1998) for an elaboration.

⁴In Section 4B we show an example where these labels have a macroeconomic context. In particular a liberal policy consists of temporary budget deficits which boosts returns and output only in a heterodox state. If the state of the world is orthodox, it is best to pursue a conservative policy in the form of low fiscal expenditures and no taxes. A policy mismatch, for e.g. if a liberal policy is implemented in an orthodox state, it will result in a decrease in returns to foreign investors because of a higher tax rate(or devaluation).

have reliable private information that an alternative policy is more suitable. What is striking is that, governments feel compelled to enact(or persist with) policies that are likely to have an adverse impact on the productivity of the economic environment. We identify two situations under which governments have an incentive to play this ‘confidence game’.

The first reason why governments play the ‘confidence game’ arises when priors are skewed in favor of a particular state of the world. In order to attract capital to boost national income, the government will enact a policy that signals that it is relatively confident of success - even though this policy has an adverse impact on the economic environment. We call this the ‘conformity bias’ in governmental decision making - when the government enacts an inappropriate policy just because the policy conforms to the policy foreign investors expect to see. To see this consider the case where the priors of the market are that ‘conservative’ policies are likely to be successful because the ‘orthodox’ state is expected to prevail. The government, by taking an action that conforms to the market’s priors, signals that its private information reinforces the prior. Therefore, by taking such an action, the government signals confidence that the ‘conservative’ policy chosen is going to be successful. Therefore, the incentive to attract foreign capital gives rise to the ‘conformity bias’. In a sense the conformity bias capture Krugman’s(1998) worry that in the new global economy *“sound economic policy is not sufficient to gain market confidence; one must cater to the perceptions, the prejudices, and the whims of the market.”*

We then demonstrate another scenario in which a government may mislead foreign investors. Consider the case where priors are not skewed, but that the returns to investment differ across the two states. So for example, if the returns to investment are higher when the ‘liberal’ policy is matched with the ‘heterodox’ state of the world. In this scenario we show that the government will have an incentive to enact a policy that signals that ‘good news’ lies ahead i.e. productivity is going to be high and the heterodox state is expected. By acting confident and reflecting its inherent optimism about the underlying fundamentals

in its policy choice, the government hopes to convince foreign investors to invest more than what they would have if an orthodox state of the world prevailed. We call this the ‘good news bias’ in government decision making. This result is directly applicable to the issue of policy persistence. What this result suggests is that if the government’s response to bad economic news that requires urgent corrective measures will be inefficient. The government will have a tendency to hope for the best and pretend that business is as usual, rather than make the necessary policy adjustments.

This informational inefficiency that results from an incentive to deceive on the part of the government has interesting implications for the pattern of investment flows. We show that investment flows have a nonmonotonic relationship with the degree of ex-ante uncertainty about success of a governmental policy. Investment increases as uncertainty decreases until a certain threshold level of uncertainty is reached. Any further decrease in uncertainty, rather than increase capital inflows, results in their collapse. This is because the ‘conformity bias’ equilibrium in which the government attempts to signal ‘confidence’, is perfectly anticipated by foreign investors. Ipso facto, investment flows are much lower than if governments did not attempt to deceive. Therefore, lower capital inflows result precisely because of the attempt to attract capital inflows beyond the amount that would have been forthcoming in a full information world, to the detriment of national income and welfare.⁵

The inflow of foreign capital has been regarded as crucial for the economic success and political sustainability of economic reforms that have taken place in developing and transition economies (Sachs, 1994). The informational inefficiency that we highlight gives rise to an intriguing implication about the role of ideology in attracting foreign capital during economic reform. Imagine a situation in which governmental policy is determined by an incumbent of a certain ideological predisposition towards or against a certain policy (e.g. ‘liberal’ or

⁵It is important to observe that all the results that we highlight take place only when globalization has proceeded far enough to allow for the free flow of capital.

‘conservative’). What we show is that when the priors of all agents in the economy are skewed in the direction of (for example) ‘conservative’ policies being successful, welfare might be higher if a ‘liberal’ runs the government. This is so because a liberal in choosing his policy might be responsive to the private signal she receives, while a conservative would not. As in Cukierman and Tommasi(1998), our analysis emphasizes that ‘credibility’ is a function not just of the policies adopted, but on *who* adopts the policies i.e. the policy - policymaker pair.

Our paper is related to the literature in political economy which address the issue of failure or delay in the adoption of policies of economic reform. Alesina and Drazen(1991) and Fernandez and Rodrik(1991) focus on the interplay between politics and policy choice when groups or individuals are uncertain about the net benefits of economic reform. In contrast to the focus on redistributive conflict in these papers our paper emphasizes the importance of signaling in generating inefficient policy outcomes. While this paper does not deal with political economy issues directly, an implication is that inefficiencies in policy choice are exacerbated prior to elections.

Furthermore, our work is related to the literature on policy signaling in an open economy. Drazen and Masson(1994) and Bartolini and Drazen(1997) explored some of the implications of policy signaling in an open economy. In this work the government enacts a policy that is observed by investors, who use it to infer about the future course of such policies. What is of interest is that these papers show that there is no simple correspondence between the policy chosen and government ‘type’, once we allow for signaling of resources or changes in the environment. In contrast to these papers, in our paper there is no necessary presumption that policies or indeed governments can be ranked as being ‘tough’ or ‘weak’ - different policies are suitable for different circumstances. Indeed the observed policy choice has no dynamic implications about the future course of such policies, since the emphasis over here is on the signaling of private information, and the perverse incentive effects this generates.

This paper is also similar in structure to work in managerial economics by Brandenburger

and Polak(1996) and Prendergast and Stole(1996). Under the assumption that managers care about the current valuation of firms, in Brandenburger and Polak, there emerges an informational inefficiency similar to the one in this paper. In our model on the other hand, the focus is on the interaction between governmental policy and international capital flows. In sharp contrast to their paper, our results imply that the informational inefficiency may persist even if managers care about the value of the final output, the assumption of current valuation is not essential.

In Section 2, we set up the benchmark economy and analyze the equilibrium in Section 3. Section 4 deals with the pattern of capital flows. Section 5 discusses the role of ideology and Section 6 concludes with a discussion.

2 The Benchmark Economy

Governmental Policies and the Private Sector

The economy consists of a number of projects that produce output (Y) using capital (k) and an inelastically supplied domestic factor, d (say land). Here we assume that foreign investors supply all capital. The production function is given by, $Y = \tilde{G}k^\alpha d^{1-\alpha}$, where k is the amount of capital, d is the domestic factor and $\alpha \in (0, 1)$. Private sector output is a function of the productivity of a public good supplied by the government. The productivity of this public good is a random variable \tilde{G} where $\tilde{G} \in \{G_L, G_0, G_1\}$. Notice that since we assume that all capital is supplied by foreign investors, the returns to the domestic factor are $(1 - \alpha)Y$. We assume that the government's objective is to maximize the rewards to domestic factors i.e. national income.⁶

⁶We make this assumption to avoid complicating our analysis by bringing in sovereign debt issues. This is not just because sovereign debt issues are well understood (see Eaton and Fernandez(1995) for a comprehensive survey), but because outright expropriation(unrelated to fundamentals) is rarely observed. However, as will become clear, our framework allows governments to implicitly tax and expropriate foreign investors through

Government policies affect the returns to investment, through their impact on the ‘quality’ of the economic environment - we capture this in terms of the productivity of a public good.⁷ There exists uncertainty as regards the productivity of this public good. The government selects a policy $a \in A = \{a_0, a_1\}$ that determines the actual productivity of the public good. The productivity of the public good is a function of whether the chosen policy is correctly matched with the underlying state of the world S_i where $S = \{S_0, S_1\}$. In other words the productivity of the public good is a function g given by,

$$\tilde{G} = g(a_i, S_j) = \begin{cases} G_i & \text{for } i = j \\ G_L & \text{for } i \neq j \end{cases}$$

where $i, j \in \{0, 1\}$. If policy a_i is successfully matched with the state of the world S_i then the public good is productive and given by G_i . If $G_i > G_j$ then G_i is called the **high** productivity realization and G_j as the **medium** productivity realization for $i, j \in \{0, 1\}$. If there is a policy-state mismatch in that action a_i is implemented when the state of the world is S_j where $i \neq j$, then the public good is of **low** productivity, G_L where $G_i > G_L$. For simplicity we assume that $G_L = 0$. What makes the task of matching a policy to the appropriate state difficult is that the true state of the world is *unknown*.

The above structure captures two important aspects of policy making. The first is that the above formulation captures the uncertainty inherent in much of policy making. In addition, an appealing feature of our framework is that this state-contingent nature of policy choices is captured in a particularly simple way, and is suggestive of a variety of contexts.⁸ However this

a poor choice of policy.

⁷All governments implement policies that affect the returns to investment. This impact of governmental policy can be through any of various channels that have an impact on the economic environment that the foreign sector operates in. This might be anything from the appropriate policy mix conducive to investment, to the productivity of infrastructure or any other public good that affects private sector returns.

⁸It is difficult to think of economic policies which are optimal in *all* conceivable states of the world. Our framework can be useful in studying a variety of policy environments, where there exists some uncer-

simplicity comes at a cost, since we do not have an explicit macroeconomic channel through which the government's policy choice effects the returns to private investment. However, in section 4B we make partial amends and suggest how our basic structure can easily be augmented, to address the issue of fiscal deficits and tax rates.

Informational Structure and the Timing

In the first period, nature moves and chooses the underlying state of nature. With **prior** probability ω the state is S_1 . The government receives an informative **private signal** \hat{s}_i about the state of the world being S_i , where $i \in \{0, 1\}$. The **degree of reliability** or the likelihood that the private signal is accurate is ϕ where $\phi = P(\hat{s}_0|S_0) = P(\hat{s}_1|S_1)$. Thus the government receives a private signal \hat{s}_i , on the basis of which it updates its priors about the likelihood of the state being S_1 . The government then implements a publicly observable policy a_i , which affects the productivity of the public good. success depends on there being a match between the policy undertaken and the unknown state of the world. Foreign investors observe the policy enacted by the government and choose investment levels. The productivity of the public good is finally realized and foreign investors and the government receive payoffs.

Before we go on, it would be useful to describe the relationship between private signals \hat{s}_i , governmental actions and the productivity of the public good in greater detail.

Policy Success: The Role of Information

The public good will be productive if the policy chosen is matched to the appropriate state i.e. action a_i taken when the state is S_i . Given that the state of the world is unknown, any information about it potentially helps the government recognize the appropriate policy, tainty about the underlying state. For example, the optimal money supply growth rate is a function of the true(unknown) natural rate of unemployment. Similarly, a policy choice of defending the exchange rate might make more sense in some economic environments than others.

though the government may or may not have an incentive to choose it. The government has two pieces of information - the priors and the private signal, which it can use to discover the true state of the world. Thus the government will update its priors on the true state, based on the private signal received, using Bayes rule.

If the private signal received is \hat{s}_1 and its degree of reliability is ϕ we have, $P(S_1|\hat{s}_1) = \frac{\phi\omega}{\phi\omega+(1-\phi)(1-\omega)}$. Similarly, if the private signal received by the government is \hat{s}_0 we have, $P(S_0|\hat{s}_0) = \frac{\phi(1-\omega)}{\phi(1-\omega)+(1-\phi)\omega}$. Unless the private signal is perfectly accurate (in which case ϕ equals one or zero), there will always be a positive probability that the policy enacted might result in low productivity of the public good, G_L .

Therefore conditional on receiving the private signal \hat{s}_i , the probability that the unknown state is S_i , is always higher when the signal is \hat{s}_1 than when it is \hat{s}_0 . Now consider the relationship between the private signal and the prior. There exist two possibilities, either the private signal is more reliable than the prior or vice versa. WLOG we deal with the case where $\omega, \phi > 1/2$. This leads to Case I and Case II below.⁹

Case I. $\omega > \phi > 1/2$.

Here the degree of reliability of the prior ω is greater than the private signal \hat{s}_i received by the government for $i \in \{0, 1\}$. Therefore, quite irrespective of the private signal \hat{s}_i received, the government's policy choice will be to go by its prior if it wants to maximize the productivity of the public good. In this case, irrespective of the private signal received, the government will go by its priors. two and no 'incentive to deceive'. This case is not of interest to us, since there is no conflict of interest between foreign investors and the government.

Case II. $\phi > \omega > 1/2$.

⁹In a binary state space it is easy to deal with various cases of $\omega, \phi \in [0, 1/2)$. We ignore for the moment, the knife-edge case where $\omega = 1/2$. However, it is something that we will explicitly consider in the next section.

In this case, the degree of reliability of the private signal received by the government ϕ , is greater than that of the prior ω . First consider the case where the signal received by the government is \hat{s}_1 . Here the private signal and the priors are in accord. The revised probability is updated using Bayes rule and suggests that expected public good productivity will be maximized if policy a_1 is chosen. Next let us consider the case where the private signal is \hat{s}_0 . In this case the prior and the private signal are in conflict. However the private signal is more reliable, so choosing action a_0 will maximize expected public good productivity. This case is of particular interest to us. We impose parametric restrictions such that this is in fact the case.

ASSUMPTION I. *The degree of reliability of the private signal is always greater than the prior, i.e. $1 > \phi > \omega \geq 1/2$.*

Simple manipulation of the above updated probabilities enables us to state the following lemma,

LEMMA I. *If $\phi > \omega > 1/2$ then $P(S_1|\hat{s}_1) > P(S_0|\hat{s}_0) > 1/2$.*

Therefore conditional on receiving the private signal \hat{s}_i , the probability that the unknown state is S_i , is always higher when the signal is \hat{s}_1 than when it is \hat{s}_0 . Assumption I in conjunction with Lemma I give rise to the following observation.

OBSERVATION I. *The government's choice of policy a_i when the private signal is \hat{s}_i , $i \in \{0, 1\}$, will maximize expected productivity of the public good.*

Now the problem that arises is that the government does not have an incentive to always maximize the expected productivity of the public good. In order to understand why the government might deliberately choose to enact a policy that might result in (expected terms) an unproductive public good we have to study the equilibria of the above game.

3 Equilibrium Analysis

The structure of our problem is one of a Bayesian game with observable actions. In order to solve for the equilibrium we use the solution concept of Perfect Bayesian Equilibrium.

A government that receives private signal \hat{s}_i is of type $t_i \in T = \{t_0, t_1\}$ where $i \in \{0, 1\}$. The government's policy choice $a_j \in A = \{a_0, a_1\}$ constitutes a 'signal' that is received by foreign investors. On receipt of the signal foreign investors choose an investment level $k \in R^+$. This ends the game and payoffs are realized. It is common knowledge that foreign investors and the government have prior beliefs ω that the state of the world is S_1 . The government's behavioral strategy σ_g is a mapping that prescribes a probability distribution over policy choices a_i , to be taken for every possible private signal received (hence type) and prior ω , i.e. $\sigma_g : (0, 1) \times T \rightarrow [0, 1]$ such that $\sum_i \sigma_g(a_i, t_j) = 1$ for each t_i for $i, j \in \{0, 1\}$ where $P(a = a_i | \omega, t_j) = \sigma_g(a_i, t_j)$. The foreign investors behavioral strategy is given by a function σ_f which prescribes a choice of investment level, for every possible policy choice of the government i.e. $\sigma_f : A \rightarrow R^+$ for each policy choice a_i of the government.

In equilibrium, the foreign investors will maximize the returns to their investment and the government's strategy will be to choose a policy that maximizes national income. Let us turn to the foreign investor's problem.

3.1 Optimization

Foreign investment levels are a function of the strategy pursued by the government. The government will pursue the action that maximizes national income through enhancing total output. However, it is important to remind ourselves that the government's objective is to maximize national income and *not* the productivity of the public good. The reason is that the government might be willing to enact a policy that has an adverse impact on the economic environment (public good productivity), so long as its policy choice can induce

enough capital inflows. To see this let us begin by first studying the foreign investor's and the government's optimization problem.

Consider the case where the government's equilibrium strategy $\sigma_g^*(a_i, t_j)$, to enact policy a_i when it receives the private signal \hat{s}_j where $i, j \in \{0, 1\}$. Foreign investor's choose investment levels in accordance with the equilibrium strategy of the government. In an open economy, capital flows are constrained by the opportunity cost of capital which is given by the world rate of interest r . The rental rate on the domestic factor (say land) is given by q . Therefore, when foreign investors observe policy a_i they choose investment levels by solving,

$$\max_{k,d} P(S_i|\hat{s}_j)G_i k^\alpha d^{1-\alpha} - (1+r)k - q.d$$

Note that the expected productivity of the public good is $P(S_i|\hat{s}_j)G_i$ since we have taken G_L to be zero. To keep things simple we normalize the amount of land used in equilibrium. Let k_{ij}^* be the level of investment chosen by foreign investors when it is an equilibrium strategy for the government to choose policy a_i on receipt of the signal \hat{s}_j . From the first order conditions we obtain,

$$k_{ij}^* = \left[\frac{\alpha P(S_i|\hat{s}_j)G_i}{(1+r)} \right]^{\frac{1}{1-\alpha}} \quad (1)$$

Given the total amount of foreign investment inflow, the total output (Y) is.

$$Y = P(S_i|\hat{s}_j)G_i \left[\frac{\alpha P(S_i|\hat{s}_j)G_i}{(1+r)} \right]^{\frac{\alpha}{1-\alpha}}. \quad (2)$$

The share of the total output that goes to the domestic factors is given by $(1-\alpha)Y$ and this gives us national income. Total output consists of two components - the expected productivity of the public good as well as the total amount of capital inflows into the country. The government's choice of policy has two effects. First it has a direct impact on the expected productivity of the public good. Second, through its influence on investor beliefs about the expected productivity of the public good, it determines the amount of capital inflow into the

country. The government might be willing to make a sacrifice in terms of a lower expected productivity of the public good so long as it manages to attract sufficient capital inflows.

3.2 Equilibrium with No Private Information: Public Signal

Consider the case where the private signal \hat{s}_i is publicly observed. From Observation I the expected productivity of the public good is maximized when the government selects a policy in accordance with the signal observed. We observe that expected productivity of the public good is higher when the signal observed is \hat{s}_1 rather than \hat{s}_0 . This might happen for two reasons. First, given that $\omega > 1/2$ we know from Lemma I that the posteriors are unbalanced i.e. $P(S_1|\hat{s}_1) > P(S_0|\hat{s}_0)$. Second, if productivity differs across the two states and we have $G_1 > G_0$. From inspection of the maximization, we observe that under both these circumstances the expected productivity of the public good is higher when the signal is \hat{s}_1 . This implies that $k_{11}^* > k_{00}^*$.

In what follows the relative productivity of the public good across the states is important and for convenience we label it γ , where $\gamma = \frac{G_1}{G_0}$.

PROPOSITION I. *If there is no private information, for all $\omega \in [1/2, 1)$ and $\gamma \in [\frac{1}{\gamma}, \bar{\gamma}]$, a unique equilibrium where the government selects a_i when the signal is \hat{s}_i for $i \in \{0, 1\}$.*

PROOF : Suppose the government's equilibrium strategy σ_g^* is to follow the signal \hat{s}_i where $i \in \{0, 1\}$. Consider a deviation where the government on receiving \hat{s}_i adopts a_j where $i \neq j$. Then since $P(S_j|\hat{s}_i) < P(S_i|\hat{s}_i)\gamma$, implies $k_{ji}^* < k_{ii}^*$ for $\gamma \in [\frac{1}{\gamma}, \bar{\gamma}]$. Since both the productivity of the public good and capital inflows are lower, national income is (in expected terms) also lower, and the government would have been better off following its signal. ■

If the relative productivity in one of the states is sufficiently greater than the other, then quite irrespective of the signal received it would be a first best to take the action for which the productivity is very high - hence the restriction on the γ . The key aspect to keep in mind is that when there is no private information, the objectives of the government and foreign investors are *aligned*.

Having examined the case where the signal is publicly observed we now revert back to the case where the signal is the private information of the government. We will demonstrate that when there is private information available to the government, the alignment between its interests and those of the foreign investors will break down.

3.3 Equilibrium with Private Information

A. INCENTIVE COMPATIBILITY OF FIRST BEST

Government policies have a direct impact on the returns to investment, through their effect on the economic environment. However their influence goes beyond this direct impact. Since the government has private information about the underlying state of the world, its policy choice can convey a signal to foreign investors about the expected productivity of the public good. Once we take cognizance of this signaling aspect of policy choice, we see that governments might have an incentive to deceive foreign investors about the private information they might have about the economic environment.

Recall our analysis of the economy with no private information. We saw that expected productivity of the public good (and hence capital inflows) is higher when the private signal received is \hat{s}_1 than when it is \hat{s}_0 , since from equation (1), $k_{11}^* > k_{00}^*$. Thus in order to attract foreign capital, the government might attempt to deceive investors by enacting policy a_1 when in fact it received the private signal \hat{s}_0 . Of course there exists a tradeoff for the government, because by enacting a policy that is in conflict with its private signal, the expected productivity of the public good is lower. Thus there are two factors that underlie the government's decision-making - the *productivity* of the economic environment (i.e. the public good) and the *size* of capital inflows.

The following proposition confirms that in a world with private signals, the first best outcome, is not incentive compatible.

PROPOSITION II. *There exist parameters for which there does not exist an equilibrium in*

which the government finds it incentive compatible to enact policy a_i when its private signal is \hat{s}_i .

PROOF : Suppose \exists a Perfect Bayesian Equilibrium in which it is the government's equilibrium strategy is to always choose a policy that follows its private signal i.e. $\sigma_g^*(a_i, t_i) = 1$. The equilibrium strategy of foreign investors is $\sigma_f^*(\cdot|a_i)$ where Bayes rule is used to form posterior beliefs $\mu(t_i|a_i)$. In this candidate equilibrium the payoff to a government of type t_0 of choosing policy a_0 is given by,

$$u^*(t_0, \sigma_g^*, \sigma_f^*, \mu(\cdot|a_0)) = (1 - \alpha)Y = (1 - \alpha)P(S_0|\hat{s}_0)G_0 \left[\frac{P(S_0|\hat{s}_0)G_0\alpha}{R} \right]^{\frac{\alpha}{1-\alpha}}.$$

Suppose on receiving \hat{s}_0 the government deviates and takes the action a_1 . The payoff to the government would be,

$$u^*(t_0, \sigma_g^*, \sigma_f^*, \mu(\cdot|a_1)) = (1 - \alpha)Y = (1 - \alpha)P(S_1|\hat{s}_0)G_1 \left[\frac{P(S_1|\hat{s}_1)G_1\alpha}{R} \right]^{\frac{\alpha}{1-\alpha}}.$$

This deviation is profitable if there exist parameters for which $u^*(\dots, \mu(\cdot|a_0)) < u^*(\dots, \mu(\cdot|a_1))$.

On simplifying we get,

$$\frac{P(S_0|\hat{s}_0)}{1 - P(S_0|\hat{s}_0)} - \left[\frac{P(S_1|\hat{s}_1)}{P(S_0|\hat{s}_0)} \right]^{\frac{\alpha}{1-\alpha}} \left(\frac{G_1}{G_0} \right)^{\frac{1}{1-\alpha}} < 0. \quad (3)$$

Hence if (3) holds we have a contradiction, since then there does not exist a PBE in which the government follows its private signal. ■

So why does the government not choose the first best policy and select the policy in accordance with its private signal? This is because the government fears that by doing so it might have an adverse impact on international capital markets. Foreign investors will choose to invest less in the country since they are less 'confident' that government policy will be successful and result in high returns. This loss in 'market confidence' might arise because of one of two reasons. First, if the government goes against its prior, investors fear that the government is more uncertain about the possibility of success of its policy. Second, if the government is not very optimistic about future economic conditions, then by signaling as such through its policy choice, capital inflows will also remain limited. While we postpone a discussion of the precise intuition underlying the condition given by (3) till we present

the equilibrium, it is important to observe the following. Equation (3) is more likely to be satisfied for two sets of parameter values - a greater skew in the prior (i.e. an ω closer to one) as well as a higher relative productivity of the public good (i.e. high $\gamma = G_1/G_0$). In our treatment of the equilibrium, we will discuss both these cases separately.

Having shown that the government has an incentive to deceive in making its policy choice, we now describe the set of parameters for which we have a pooling equilibrium, where the government has an incentive to ignore its private information.

This pooling equilibria might arise because of two factors. First, we show that when the skew in the priors is large enough, there exists a pooling equilibrium in which governmental decision-making is plagued by a ‘conformity’ bias. Second, even if there is no skew in the priors, so long as the productivity of the public good across the states is sufficiently different, there exists a pooling equilibrium where government decision making suffers from a ‘good news’ bias. In order to keep our analysis transparent we analyze the equilibrium under two different scenarios separately.

B. THE ‘CONFORMITY BIAS’ EQUILIBRIUM ($\omega \geq 1/2, \gamma = 1$)

An equilibrium involving a **conformity bias** arises if the government has an incentive to ignore its private information and deceive foreign investors because of a skew in the priors ($\omega > 1/2$). To understand the reason for this, consider the government’s dilemma when it receives a private signal that contradicts its priors about which policy is best. If the government undertakes the policy that maximizes the returns to capital, it will choose the policy that is in accordance with its private signal. However, since this policy contradicts its prior, the government (and the investors) are less ‘confident’ of its eventual success. Therefore, foreign investors are likely to invest less in the country. On the other hand, if the government chooses a policy that ‘conforms’ with the priors of the international capital market, it signals that it is relatively ‘confident’ of success. Through its policy choice, the government hopes to deceive investors into investing a large amount of capital into the country. Of course, this

is going to have an adverse impact on the economic environment (the productivity of the public good). However, so long as the capital inflows are large enough to offset this adverse impact on productivity on the national income, the government will conform with the priors of the market.

PROPOSITION IIIA *All equilibria in pure strategies are a function of ω , when $\gamma = 1$,*

(ii) \exists an $\bar{\omega}$ such that $\forall \omega < \bar{\omega}$ we have a separating equilibrium where the government enacts a policy a_i when it receives a private signal \hat{s}_i ,

(ii) \exists an $\hat{\omega}$ such that $\forall \omega > \hat{\omega}$ we have a pooling Perfect Bayesian Equilibrium where the government ‘conforms’ with the priors of the market and enacts policy a_1 .

PROOF : See Appendix. ■

This being a signaling game, it is reasonable to ask whether the pooling equilibrium we have identified is robust to refinements. However in this case this is not an issue, since the pooling equilibrium survives even if we allow foreign investors believe that any deviation from the proposed equilibrium will be by t_0 .

While we have established the existence of a pooling equilibrium, we have not fully characterized all the possible equilibria for various parameter values. We begin by examining the relationship between investment patterns (and welfare) and uncertainty about the state of the world. This helps us understand the impact on investment and welfare of the ‘conformity’ bias in governmental decision making.

Foreign investors choose to invest in the country in order to take advantage of profit making opportunities. The size of capital inflows depends on the ‘quality’ of the economic environment that foreign investors believe they face. Of course, the ‘quality’ of the economic environment is a function of the equilibrium strategy of the government.

In what follows, it is useful to keep in mind that in our analysis, expected capital inflows and national welfare are positively related. We begin by calculating expected capital inflows.

In a separating equilibrium where the government selects a policy in accordance with its private signal we have to account for the probability of the government receiving the private signal i.e. $P(\hat{s}_i)$.¹⁰ Then expected capital inflows in the case of a *separating* equilibrium (k_S^{*e}) where the government adopts a policy in accordance with its signal is given by,

$$k_S^{*e} = P(\hat{s}_1) \left[\frac{\alpha P(S_1|\hat{s}_1)G_1}{(1+r)} \right]^{\frac{1}{1-\alpha}} + P(\hat{s}_0) \left[\frac{\alpha P(S_0|\hat{s}_0)G_0}{(1+r)} \right]^{\frac{1}{1-\alpha}} \quad (4)$$

Expected capital inflows in a *pooling* equilibrium where the government takes a_1 regardless of the private signal received is given by,

$$k_{P1}^{*e} = \left[\frac{\alpha \omega G_1}{(1+r)} \right]^{\frac{1}{1-\alpha}} \quad (5)$$

The above equation helps emphasize the importance of the equilibrium strategy of the government in determining equilibrium capital inflows. So the question that we now ask is the following. How would capital inflows and national welfare change with a decrease in uncertainty about the economic environment?

Here we analyze capital inflows as uncertainty decreases, which is captured in the form of a rise in ω from its highest value (namely $\omega = 1/2$) to the case when uncertainty about the state of the world completely disappears (i.e. $\omega = 1$).¹¹

We use Proposition IIIa and equations (4) and (5) to derive the relationship between expected capital inflows and changes in the degree of uncertainty - which is captured in Figure 1.¹²

Why do capital inflows seem to have a *nonmonotonic* relation with the degree of uncertainty about the underlying state of the world?

¹⁰Recollect that $P(\hat{s}_1) = [\phi\omega + (1-\phi)(1-\omega)]$ and $P(\hat{s}_0) = [\phi(1-\omega) + (1-\phi)\omega]$.

¹¹A symmetric argument holds for the case when ω decreases and approaches zero.

¹²Figure 1 is drawn for a ϕ close to 1 and $\omega \in [1/2, 1]$ and $\gamma = 1$. We fix ϕ close to one since this enables us to illustrate in Figure 1 the impact of changes in ω between zero and one without having to worry about violating Assumption I i.e. $\phi > \omega \geq 1/2$.

Figure 1: Expected Capital Inflows under a Conformity Bias

The level of expected capital inflows depends on the equilibrium strategy of the government. When uncertainty about the state of the economic environment is highest when $\omega = 1/2$. From Proposition IIIa foreign investors will choose investment levels fully aware that so long as $\omega \leq \bar{\omega}$, the government will use all its information and will enact policies that have a positive impact on the economic environment. As ω increases, i.e. uncertainty comes down and we have to account for two possible effects. First, as uncertainty comes down, the prior information available to the government improves. Therefore, the government, if it chooses to utilize its information, is in a better position to make the productivity of its policies successful. This will tend to stimulate investment (see equation (4)). The second effect we have to account for, is the impact on the government's equilibrium strategy, and its incentive to deceive on receipt of private signal \hat{s}_0 . However we know that so long as $\omega \leq \bar{\omega}$ (uncertainty is relatively high), the government will have no incentive to deceive. Consequently, ex-ante capital inflows rise with a decrease in uncertainty.

If uncertainty decreases beyond a threshold $\hat{\omega}$, we have a different scenario. The government now switches its equilibrium strategy. It now has an incentive to ignore its private information, and take action a_1 quite irrespective of the private signal received. Foreign investors are aware of this, and choose (in equilibrium) to go by their priors in making investment decisions. The government's attempt to induce an increase in investment, only succeeds in depressing it. A further decrease in uncertainty about the state of the world, implies that even if the government always chooses action a_1 , it is more likely to be successful. Therefore, investment gradually rises. However investment levels remain lower than what they would have been if there were no conformity bias. When ω equals one, uncertainty about the state of the world vanishes. The government's incentive to deceive foreign investors, disappears and expected capital inflows show a discontinuous jump up.

The above discussion raises an important issue of general interest. Why is it that governments choose to deceive when uncertainty about the state of the world is low? To see this consider the two effects of a decrease in the degree of uncertainty - the direct impact on the economic environment (public good productivity) as well as the indirect impact on capital inflows under the *assumption* that we are in a truth telling equilibrium where the government follows its private signal.

Now consider the government's incentives to deviates from this equilibrium and undertakes to enact policy a_1 . First, observe that as the prior gets more skewed (i.e. ω close to 1) the expected loss in the productivity of the public good comes down as the prior gets more skewed. Second, the expected gain in capital flows from deviating from truth telling equilibrium and enacting policy a_1 when the signal received is \hat{s}_0 is increasing in ω .¹³ Since both the expected gain in capital flows is increasing and the expected loss in productivity of

¹³More formally, we can see this from the asymmetry in the adjustment of the posterior, in response to a change in the prior. Notice that when, $\omega > 1/2$ then $\frac{dP(S_0|\hat{s}_0)}{d\omega} < 0$, $\frac{d^2P(S_0|\hat{s}_0)}{d\omega^2} > 0$ and $\frac{dP(S_1|\hat{s}_1)}{d\omega} > 0$, $\frac{d^2P(S_1|\hat{s}_1)}{d\omega^2} < 0$.

the public good is decreasing with an increase in ω , government deception takes place at low levels of uncertainty.

C. THE ‘GOOD NEWS BIAS’ EQUILIBRIUM ($\gamma \geq 1, \omega = 1/2$)

We now turn to the case where there is no skew in the priors. We demonstrate that even in this case, so long as the relative productivity of the public good differs across the states, we have a pooling equilibrium in which the government ignores its private information. We call this a **good news bias** in governmental decision making. The intuition for this bias is the following. The government is aware that more capital inflows will come into the country when foreign investors believe that the economy is likely to pick up and good times are ahead. This gives the government a temptation to enact the policy that signals that it expects the productivity of the public good to be high (i.e. high γ), since by doing so it hopes to attract more capital.

PROPOSITION IIIB *All equilibria in pure strategies are a function of γ , when $\omega = 1/2$,*

(i) *\exists an $\hat{\gamma}$ such that $\forall \gamma < \hat{\gamma}$ we have a separating equilibrium where the government enacts a policy a_i when it receives a private signal \hat{s}_i ,*

(ii) *\exists an $\hat{\gamma}$ such that $\forall \gamma > \hat{\gamma}$ we have a pooling Perfect Bayesian Equilibrium where the government enacts policy a_1 .*

PROOF : See Appendix. ■

We now examine expected capital inflows, when the productivity of the public good in the *high* productivity state goes up. We assume for the remainder of this section that G_1 is the high state and G_0 is the medium state, so that $\gamma \geq 1$. For simplicity, if we set $G_0 = 1$ we have $\gamma = G_1$. We summarize our results in Figure 2.

The above figure describes the relationship between expected capital inflows and relative productivity of the public good across the two states. Expected capital inflows in the high state γ go up for $\gamma \in (\hat{\gamma}, 1]$. This is because the government’s equilibrium strategy involves

Figure 2: Expected Capital Inflows under a ‘Good News’ Bias

a separating equilibrium, where the government maximizes the expected productivity of the public good. Therefore so long as the government’s equilibrium strategy does not change, an increase in γ increases capital inflows (in expected terms). However, an increase in public good productivity beyond a threshold $\hat{\gamma}$, results in a discontinuous drop in capital inflows. This is because any further increase in the productivity of the public good in the high state G_1 , gives the government an incentive to change its equilibrium strategy. Governmental decision making suffers from a ‘good news’ bias in that the government has an incentive to dissimulate the private signal received and pretend that the private signal it received, conveyed ‘good news’ i.e. the high state was more likely. This attempt of the government to signal good, is perfectly anticipated by foreign investors. Therefore when the productivity in the high state crosses a threshold, investment and welfare decline abruptly.

This inefficiency persists so long as the productivity in state S_1 does not become too high. This is because when relative productivity across the states becomes very high ($\gamma > \bar{\gamma}$), the

productivity of the public good is maximized by the government always choosing policy a_1 irrespective of the private signal received.

Once again since ex-ante national welfare and expected capital flows are positively correlated, the diagram also reflects changes in welfare as a result of changes in $\gamma = G_1$.

In our analysis in this section we have analyzed the government's incentive to play the 'confidence game' under the operation of two kinds of biases. For expositional reasons, we analyzed the operation of a 'good news bias' distinctly from that of the 'conformity bias'. However, it is easy to imagine situations where for some parameters, both these biases are in operation. Moreover they can work in *opposite* directions. Indeed it is not difficult to show that we can obtain a pooling equilibrium where the 'conformity bias' dominates the 'good news' bias. This observation suggests that governments might be compelled to enact policies that are *unnecessarily harsh*. For example, if the international capital market expects that a conservative policy involving a slashing of budget deficits and lower returns to investment are necessary for recovery, the government will enact such a conservative policy - to the detriment of the economic (and maybe even political) situation.¹⁴

4 Extensions

A. POLICY IMPLEMENTATION : THE ROLE OF IDEOLOGY

The preceding analysis raises an interesting question. Can a society design institutions to mitigate the informational inefficiency that we identified? In this regard we show the role of ideology in alleviating this informational inefficiency.

More precisely we ask the following question. Can there be rational reasons for us to suppose that a country might be better off having ideologically contrarian governments in power? For example, when priors are skewed in favor of 'conservative' policies being more

¹⁴Once again Krugman(1998) and Rodrik(1999) and Wade and Veneroso(1998) have an excellent discussion of actual instances wherein such harsh economic measures of dubious merit have been undertaken.

likely to be successful, can it ever make sense to have a ‘liberal’ government in place to implement them? Analysis of this issue helps describe an institutional mechanism through which society might be able to mitigate the informational inefficiency that we described in the last section.

The execution of policies is often ‘delegated’ to institutions, individuals or indeed political parties. Two distinct literatures address this general question. Rogoff (1985) argues for the appointment of an inflation averse ‘conservative’ central banker to mitigate the time-inconsistency problem that results in an ‘inflation bias’ in the conduct of monetary policy. Our analysis suggests that the role of ideology might be quite different from the one suggested in Rogoff and other related literature¹⁵. In the face of an informational inefficiency similar to the one we highlight, society might be better off having for example - a ‘liberal’ to implement policies, precisely when ‘conservative’ policies are more likely to be successful. This is so because an ideologically contrarian government might be *responsive* to the private information it receives.

Cukierman and Tommasi(1998) have also made this point in a more general explicitly political economy context where they develop a framework of policy reversals. Their insight is related to ours, in that they also argue that in an asymmetric information context, credibility of the policy is a function of the policy - policymaker pair. However, our analysis is relevant to the impact of the policy maker’s ideological predisposition might have in attracting foreign capital. Unlike their framework, in our model, the informational inefficiency that we identify persists even if the policy maker has *no* ideological predisposition. In contrast to Cukierman and Tommasi our model predicts that *moderate* governments are more likely to engage in policy reversals, rather than extremist parties. We now outline the simplest possible variant of the benchmark model that helps illustrate our claim.

Suppose the government can be run by two kinds of political parties, L and R . Once in

¹⁵See Persson and Tabellini (1994) for a collection of articles devoted to the subject.

government each party faces a choice to enact one of two policies a_L and a_R .¹⁶ As earlier, if the appropriate policy a_j is matched with the appropriate state of the world S_j where $S_j \in \{S_L, S_R\}$, the public good is productive. The prior of all agents in this economy is that the unknown state is more likely to be S_R , i.e. $\omega > 1/2$. For simplicity we also assume that $\gamma = 1$. The only difference from the previous section is that a party of type L gets a lump sum utility from pursuit of policy a_L (and likewise for party R).¹⁷ The utility function of each political party is the following,

$$W_j = \theta + (1 - \alpha)Y$$

where $\theta > 0$ is a lump sum utility that a government of type j gets from enacting policy a_j where $j \in \{L, R\}$ and $(1 - \alpha)Y$ is the share of total output that goes to domestic factors. If a government run by party j implements policy a_k , then $\theta = 0$ for $j \neq k$ where $j, k \in \{L, R\}$. For a completely closed analysis the ideology parameter should derive from the preferences and initial endowments of individuals. However, a fuller analysis would take us too far from our original model.

Under these circumstances, we show that if the government of ideology L implements policies, it might choose policies which maximize the productivity of the public good while a government of ideology R would not. The intuition for this result is the following. From Proposition II we know that in an open economy a ‘conformity’ bias in governmental decision making arises for any government that cares about national income. This results in it choosing a_R , irrespective of the private signal received. However, if a government has an ideological predisposition *against* implementing policy a_R , then the pooling behavior of the government can be overturned. A government of ideology L might take action a_R if the private signal

¹⁶We change our notation so as to be able to match actions to ideology in a transparent manner. R replaces 1 and L replaces 0.

¹⁷For example, suppose the budget has to be balanced. The liberal party might get utility from achieving this by hiking taxes. The conservative party might prefer to cut food subsidies in order to balance the budget.

is \hat{s}_R . This is because, the loss in national income as a result of the government ignoring its private signal, might be greater than the associated gain θ , of pursuing a policy more towards its taste. Similarly, if the government received private signal \hat{s}_L , it might prefer to take action a_L . This latter policy choice might arise because the loss in national income by choosing not to deceive, might be lower than the gain in utility because of pursuing a policy in accordance with its ideology. Thus a ‘conformity’ bias in favor a particular policy can be controlled if there is an ‘ideological’ bias against that very policy.

The following proposition formally establishes the preceding intuition.

Proposition IV. *When $\omega > 1/2$, \exists a $\bar{\theta} \in (0, 1)$ and $\underline{\theta} \in (0, 1/2)$ where $\bar{\theta} > \underline{\theta}$ such that,*

- (i) when $\theta \in [\underline{\theta}, \bar{\theta}]$, \exists a PBE where government L takes a_i when the private signal is \hat{s}_i ,*
- (ii) when $\theta > \bar{\theta}$, \exists a PBE where government L takes a_L irrespective of the signal received,*
- (iii) when $\theta < \underline{\theta}$, \exists a PBE where government L takes a_R irrespective of the signal received.*
- (iv) when $\theta \geq 0$, \exists a PBE where government R takes a_R irrespective of the signal received.*

Proof : See Appendix. ■

Hence it might be the case that when policy a_R (‘conservative’) is more likely to be successful ($\omega > 1/2$), an incumbent of ideology L (‘liberal’) might choose an action in accordance with his private information while an incumbent of ideology R (‘conservative’) would not. However, the following caveats are in order. As the above proposition points out, the liberal incumbent should be a ‘moderate’. In other words the liberal incumbent cannot be an ‘extremist’ in that his taste parameter θ is too high. If the liberal incumbent’s taste parameter is too high, he will always choose the policy a_L , quite irrespective of the private information he might have received. Similarly, if the incumbent is not liberal enough i.e. a ‘centrist’ in that the utility he receives from taking action a_L is negligible (i.e. θ close to zero), he suffers from a ‘conformity bias’ and takes action a_R irrespective of the signal received.

A completely symmetric argument applies if priors were skewed in the direction of ‘liberal’

Figure 3: National Income and Ideology

policies being more likely to be successful. In this case a ‘moderately’ conservative incumbent can be expected to utilize his private information in making his policy choice, while a liberal incumbent would not.

Total investment is a function of the expected productivity of the public good. The productivity of the public good is highest when the government enacts a policy that responds to its private signal. It is here that the ideological predilection of the incumbent plays an important role. Investment and national income thus are affected by the ideology of the government. In order to examine the relationship between ideology and national income, let us first begin by defining the expected national income when policy a_i is enacted by a government of ideology i and parameter θ as $y_i(\theta)$ where $i \in \{L, R\}$.

In order to systematically describe the relationship between the ideology parameter and national income, we need to compute expected national income for different values of θ . Expected capital flows are related to expected national income $y_i(\theta)$ in a monotonic manner for $i \in \{L, R\}$. From Proposition IV expected capital flows are highest for a truth telling

separating equilibrium. This implies that $y_L(\theta)$ for $\theta \in [\bar{\theta}, \underline{\theta}]$ is greater than $y_i(\theta)$ for $\theta \notin [\bar{\theta}, \underline{\theta}]$ for $i \in \{L, R\}$ since for all these parameters we have a pooling PBE from Proposition IV, where foreign investors go by their priors. $y_L(\theta)$ for $\theta \in [\bar{\theta}, \infty]$ is the lowest since here the government pools on a_0 . Foreign investors accordingly choose their investment levels. This implies that expected national income is lower than pooling at a_1 . This results in Figure 3 which is drawn for $\omega > \hat{\omega}$.

B. AN APPLICATION: BUDGET DEFICITS AND FISCAL POLICY

An appealing aspect of our basic model is its simplicity. However, this simplicity has come at the cost of a well-articulated macroeconomic structure. In this extension we outline an example to illustrate how even our simple model can easily be adapted to address macroeconomic concerns, without much additional structure. Of course, the model can be applied to several specific contexts in monetary, fiscal and other governmental policies. However, such an exploration is beyond the scope of the present paper.

Krugman (chapter 6, 1999) suggests that governments in developing countries have a preoccupation with following ‘sound’ economic policies. One of the crucial aspects of such a ‘sound’ economic policy is reduced government spending and the absence of budget deficits. While this is probably true in most states of the world, we also know that budget deficits make economic sense in some states of the world and not others. We would like to construct a simple example to that shows the following: budget deficits make economic sense in some states of the world (heterodox (S_L)) and not others (orthodox (S_R)). In this framework we ask the following question. What is the impact on government expenditure and budget deficits if the priors of the international capital market are skewed in favor of ‘conservative’ policies as being more likely to be successful?

Suppose the government supplies a public good, by incurring a temporary budget deficit of size C . This expenditure on the public good raises the returns to private investment in some states and not others. In particular, it makes economic sense for the government to incur

this expenditure and run a budget deficit if the state is S_L , and the productivity is raised up sufficiently to G_1 . If the state of the world is S_R , then it does not make economic sense for the government to run a budget deficit and supply the public good and the productivity of the public good is $G_0 = 1$, where $G_1 > G_0$. The government receives a private signal about the state of the world. It then decides on whether to borrow money from the rest of the world and incur a temporary budget deficit. Foreign investors observe the governments policy choice and make investment decision. Finally in the last period, the government chooses a tax rate τ to balance the budget deficit, where $C = \tau G_i k^\alpha$.

Now suppose the government had private knowledge that temporary budget deficits should be incurred. However, if the priors of investors are sufficiently skewed in the opposite direction, then all the results of Proposition III will apply. The government will have an incentive to be unnecessarily ‘conservative’ and keep budget deficits small. Consequently, output will also be lower than what it need be. While we do not fully develop the example over here for reasons of brevity, it should be clear that the results of the earlier sections would follow.

C. GLOBALIZATION

We begin by studying the impact on the government’s incentives to play the ‘confidence game’ in a world with *many* countries. This will enable us to better understand the impact of the process of *globalization* of capital flows on governmental decision making.

In a world with many countries we have to distinguish between domestic and foreign investors.¹⁸ The first thing to observe is that the inefficiency in policy choice, was a result of our assumption that all investment was carried out by foreign investors. Since the government’s objective was to maximize the reward to domestic factors i.e. national income, the cost of a bad productivity outcome was not internalized. This gave the government an incen-

¹⁸This is so because in a world with many countries the capital has to come from somewhere. Therefore it is no longer appropriate to assume that foreign investors provide all capital.

tive to deceive foreign investors and resulted in the inefficient pooling equilibrium. Evidently our results would change if a large fraction of total domestic investment was by domestic investors, since now the externality is internalized.

So consider the benchmark case where there is no capital mobility and all investment in the various countries was domestic. In this case we will obviously see a high degree of correlation between savings and investment across countries. A process of gradual globalization of capital flows will break down this saving-investment correlation across countries, and result in a rise in the importance of foreign capital. However, what our preceding analysis suggests, is that *if globalization of capital flows proceeds far enough, then governmental decision making will once again be characterized with an incentive to deceive and play the confidence game.*

5 Discussion

It is important to observe that our two period analysis is of much greater relevance to the case of developing and transition economies. This is because greater political instability and the associated shorter political horizons is likely to give governments in these countries more of an incentive to deceive.¹⁹ If governments had long time horizons then standard reputational concerns would mitigate the inefficiencies that we have identified.

Our results should throw a cautionary note to the wave of economic reforms that have been enacted worldwide. As Rodrik(1996) puts it “...while the reforms were at least in part inspired by the East Asian experience, they took place much more quickly and, in many areas, are

¹⁹As Sachs, Tornell and Velasco (1996) mention in their commentary on the Mexican crisis, the reason for these currency crisis was “...the unexpected shocks that occurred...and the inadequate policy response to those shocks.” The question then is , why was the policy response of the government inadequate? This paper seems to suggest that a ‘good news’ bias might be in operation. The government might want to maintain foreign capital inflows (at least till the elections) and take the inappropriate policy choice of not raising interest rates. Unfortunately foreign investors anticipate this inefficiency in governmental behavior and cutback on capital investment to the country in any case.

going considerably beyond those undertaken in East Asia. This raises the question whether the economic reformers have internalized the correct lessons from the East Asian experience.” Strikingly enough, our analysis suggests that a change in the degree of ‘consensus’(increasing skew in the priors) coupled with the prospect of attracting capital from international capital markets might have been responsible for this enthusiasm for economic reform in at least a few instances. Similarly, in their response to the recent currency crises, several South East Asian countries enacted a series of policy measures supported by the IMF. Indeed Krugman(1998), Radelet and Sachs(1998) and Wade and Veneroso(1998) have all argued that Washington and the IMF have made the mistake in advocating policies(e.g. raising interest rates to prop up the exchange rate) that were directed more at appeasing international markets and winning their ‘confidence’ rather than addressing economic fundamentals. Not surprisingly, it is argued, that these policies do not seem to have been too successful. Our analysis suggests a reason why governments might feel ‘disciplined’ to enact such policies, despite the futility of such measures, in equilibrium.

The issue that arises then is whether there exist mechanisms or institutions that governments can ‘commit’ to which mitigate or eliminate the informational inefficiencies that we highlight. Any intervention should focus on the source of the inefficiency, namely the availability of private information. If the government could reveal the private information that it has received then this inefficiency might disappear. However, it is far from clear whether governments can *credibly* reveal the private information they receive under all circumstances.²⁰ One possible mechanism is through signaling of private information through costly investment such as in infrastructure²¹. This is an issue that we do not explore in this paper, but

²⁰International institutions such as the IMF have made some attempts in this direction. In the aftermath of the Mexican peso crisis they made it compulsory for borrowing countries to release government financial data on the Internet at regular intervals.

²¹The issue of costly signaling has been addressed by Rodrik (1989) in the context of trade liberalization. In particular, he argues that credible policy reform may require going overboard: the government will have

it is not clear that it is a feasible option for many kinds of governmental policies. A second possible mechanism is through delegation to an authority whose preferences differ. Indeed this is what our discussion on the role of ideology in policy implementation attempts to emphasize.

Appendix

Proof of Proposition IIIa & IIIb : The proof of Proposition II gives us the following sufficient condition for a truth telling separating equilibrium (equation (3)),

$$Z(\omega, \gamma, \phi, \alpha) = \frac{P(S_0|\hat{s}_0)}{1 - P(S_0|\hat{s}_0)} - \left[\frac{P(S_1|\hat{s}_1)}{P(S_0|\hat{s}_0)} \right]^{\frac{\alpha}{1-\alpha}} \left(\frac{G_1}{G_0} \right)^{\frac{1}{1-\alpha}} > 0. \quad (6)$$

Now consider the case where $\gamma = 1$. Observe that when $\omega = 1/2$ the inequality given above holds and we have a sufficient condition for a separating equilibrium. Also we can check to see that $dZ/d\omega < 0$. To see that $Z < 0$, for some values, fix ϕ close to one. Now take $\lim \omega \rightarrow \phi$. As $\omega \rightarrow \phi$, observe that $P(S_0|\hat{s}_0) \rightarrow 1/2$ and $P(S_1|\hat{s}_1) \rightarrow 1$. This suggests that for some parameters the above inequality will be violated. Therefore since $dZ/d\omega < 0$ from continuity there exists an $\bar{\omega}$ such that for all $\omega > \bar{\omega}$, $Z(\omega, 1, \phi, \alpha) < 0$. This proves part (i) of Proposition IIIa.

We now prove part (ii) of Proposition IIIa. We propose an equilibrium where the government chooses policy a_1 irrespective of its type, i.e. $(\sigma_g^*(a_1|t_i), \sigma_f^*(k|a_1), \mu(t_1|a_1) = \omega)$. We fix the out-of-equilibrium beliefs at $\mu(t_1|a_0) = \hat{\mu}$ where $\hat{\mu} \in (0, P(S_0|\hat{s}_0)]$.

The payoff to a government of type t_0 under the proposed equilibrium is,

$$u_g^*(\sigma_g^*, \sigma_f^*, \mu^*) = (1 - \alpha)P(S_1|\hat{s}_0)G_1[\omega G_1 \alpha]^{\frac{\alpha}{1-\alpha}}. \quad (7)$$

to go much further than it would have in the absence of a credibility problem.

The payoff to a government of type t_0 of policy choice a_0 , which is off-the-equilibrium path is,

$$u_g^*(\sigma_g(a_0), \sigma_f^*, \mu^*) = (1 - \alpha)P(S_0|\hat{s}_0)G_0[\hat{\mu}G_0\alpha]^{\frac{\alpha}{1-\alpha}}.$$

Therefore, for the following to be true we must impose parameters such that,

$$(1 - \alpha)P(S_1|\hat{s}_0)G_1[\omega G_1\alpha]^{\frac{\alpha}{1-\alpha}} > (1 - \alpha)P(S_0|\hat{s}_0)G_0[\hat{\mu}G_0\alpha]^{\frac{\alpha}{1-\alpha}}.$$

Simplifying we get,

$$\hat{Z} = \frac{P(S_0|\hat{s}_0)}{1 - P(S_0|\hat{s}_0)} - (\gamma)^{\frac{1}{1-\alpha}} \left[\frac{\omega}{\hat{\mu}} \right]^{\frac{\alpha}{1-\alpha}} < 0. \quad (8)$$

The above inequality constitutes a sufficient condition for a pooling equilibrium at a_1 even if we allow for the weakest possible out-of-equilibrium belief of $\hat{\mu} = P(S_0|s_0)$. (Hence we do not worry about refinements). Now when $\omega = 1/2$ and $\gamma = 1$, $P(S_0|\hat{s}_0) > 1/2$ the inequality in equation (8) is reversed i.e. $\hat{Z} < 0$. To see that there exists an γ large enough such that $\hat{Z} < 0$, fix ϕ close to one. As $\omega \rightarrow \phi$ the RHS of the above inequality approaches one and the LHS something strictly greater. Since $d\hat{Z}/d\omega < 0$ from continuity there exists an $\hat{\omega}$ such that $\forall \omega > \hat{\omega}$ we have $\hat{Z} < 0$. Also observe by comparing equation(6) to equation(8) that $\bar{\omega} < \hat{\omega}$.

Now let us check for the parameters which satisfy a pooling equilibrium at a_0 . To sustain this equilibrium, we fix the out-of-equilibrium beliefs at $\mu(t_1|a_1) = \hat{\mu}$.

The payoff to a government of type t_1 under the proposed equilibrium is,

$$u_g^*(\sigma_g^*, \sigma_f^*, t_1) = (1 - \alpha)P(S_0|\hat{s}_1)G_0[(1 - \omega)G_0\alpha]^{\frac{\alpha}{1-\alpha}}$$

If the government t_1 deviates and takes the off-the-equilibrium path policy a_1 , its payoff is,

$$u_g^*(\sigma_g(a_1), \sigma_f, t_1) = (1 - \alpha)P(S_1|\hat{s}_1)G_1[\hat{\mu}G_1\alpha]^{\frac{\alpha}{1-\alpha}}$$

Deviation is profitable if $u^*(\sigma_g^*, \sigma_f^*, t_1) < u^*(\sigma_g(a_1), \sigma_f, t_1)$. Therefore for a pooling PBE at a_0 to exist, the following inequality must hold,

$$\left(\frac{P(S_1|\hat{s}_1)}{1 - P(S_1|\hat{s}_1)} \right) \gamma^{\frac{1}{1-\alpha}} < \left[\frac{1 - \omega}{\hat{\mu}} \right]^{\frac{\alpha}{1-\alpha}}.$$

Since $P(S_1|\hat{s}_1) > P(S_0|\hat{s}_0)$ and $P(S_1|\hat{s}_1) > \omega \geq 1/2 > 1 - \omega$, the above inequality is true for values of α that are not sufficiently less than one. Therefore even if we assume that $\hat{\mu} = 1/2$, there exist a wide set of parameters for which the proposed equilibrium breaks down and we have a unique pooling equilibrium at a_1 .

Finally consider the separating equilibrium where the government's equilibrium strategy is $\sigma(a_j|t_i)$ for $i \neq j$. To sustain this equilibrium even if we impose the strongest possible out-of-equilibrium beliefs, namely $\mu(t_i|a_j) = P(S_j|\hat{s}_i)$ we can check to see that we can check to see that so long as either $\gamma > 1$ or $\omega > 1/2$ deviation is always profitable and the proposed separating equilibrium breaks down.

Now we outline the proof for Proposition IIIb, which follows the above argument. We now have $\gamma = \frac{G_1}{G_0} > 1$ and $\omega = 1$. Observe that so long as $\phi > \omega$, we have $P(S_0|\hat{s}_0) > 1/2$. This implies from equation (6), that so long as γ is not too large, we have a truth telling separating equilibrium. Using the continuity and monotonicity of Z as earlier, we can show that there exists an $\hat{\gamma}$ such that $\forall \gamma > \hat{\gamma}$, the inequality in equation (6) is violated. This proves part (i) of Proposition IIIb. The proof of the existence of a pooling equilibrium when $\gamma > 1$ is even more straightforward, and can be seen by observing that equation (8) will be satisfied when we increase γ sufficiently. ■

Proof of Proposition IV. Here we only give an outline of the proof, since we concentrate on government L's optimal strategy for various values of the parameter θ . We propose a separating PBE for the government of type L where it is optimal for government L to enact policy a_i when the private signal is \hat{s}_i where $i \in \{L, R\}$. For this to be true the following two conditions have to be met. First, the payoff on receiving signal \hat{s}_R to government L from

taking action a_R is higher than if it takes action a_L ,

$$P(S_R|\hat{s}_R)G_R[P(S_R|\hat{s}_R)G_R\alpha]^{\frac{\alpha}{1-\alpha}} > P(S_L|\hat{s}_L)G_0[P(S_L|\hat{s}_L)G_0\alpha]^{\frac{\alpha}{1-\alpha}} + \frac{\theta}{(1-\alpha)\alpha^{\frac{\alpha}{1-\alpha}}}.$$

Second, the payoff on receiving signal \hat{s}_L to government L from taking action a_L is higher than if it takes action a_R ,

$$P(S_L|\hat{s}_L)G_L[P(S_L|\hat{s}_L)G_L\alpha]^{\frac{\alpha}{1-\alpha}} + \frac{\theta}{(1-\alpha)\alpha^{\frac{\alpha}{1-\alpha}}} > P(S_R|\hat{s}_L)G_R[P(S_R|\hat{s}_R)G_R\alpha]^{\frac{\alpha}{1-\alpha}}.$$

We can check to see that there exist parameters such that \exists a non-empty $\theta \in (\underline{\theta}, \bar{\theta})$ where both the above inequalities are satisfied. For example since $\gamma = 1$, the above parameters are satisfied for $\phi > \omega$, where ω very close to 1. For such values, there exists a $\theta \in (1/4, 1)$ where the above inequalities are satisfied such that there is a separating equilibrium and the proof of (i) is complete. It is easy to see that if $\theta > \bar{\theta}$ the government will take policy a_L irrespective of the signal received. From Proposition III the proof of (iii) and (iv) follows. ■

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Abstract

We show that governments in developing countries have an incentive to play what Krugman calls '*the confidence game*' - wherein the need to win the confidence of the international capital market 'can actually prevent a country from following otherwise sensible policies and force it to follow policies that it would normally consider perverse.' This incentive arises because of a combination of a 'conformity bias' and 'good news bias' in governmental decision making in an open economy, which results in inefficient outcomes. Our analysis also emphasizes the importance of ideology in issues of policy implementation in an open economy - a country might be better off with a 'liberal' government to implement policies precisely when 'conservative' policies are more likely to be successful.

KEYWORDS: Policy Implementation, Signaling, International Capital Flows, Ideology

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