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Globalization and the 'confidence game'

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Abstract

We show that governments in developing countries have an incentive to play 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 which increases rather than decreases the threat of devaluation. While institutions that encourage greater transparency and the public revelation of information, may often mitigate this inefficiency, on some occasions increased transparency may even exacerbate the inefficiency.

Keywords: Globalization; Devaluation; International capital markets; Currency crisis; Transparency

JEL classification: F33; F40

1. Introduction

The globalization of capital flows in recent years, has increased access to international capital markets for many developing countries. This globalization 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' (Camdessus, 1998).[1] While this view seems quite plausible, the recent spate

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[1] This view has been echoed by Obstfeld (1998), Feldstein (2000) and Summers (2000). For another instance consider Dornbusch (2000) who says that on facing a crisis, a finance minister will "have the ambulance rush them to the IMF. And when they do, *markets start taking confidence very soon and from there it is a short step to normalization*" (emphasis added). An excellent discussion of the issues involved in Krugman (1999) and Rodrik (1999).

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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 policymakers 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*."[2] This opinion has been echoed by Bhagwati (1998), Rodrik (1998) and Stiglitz (2002) 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.[3] 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* aspect of policy choice, the desire to attract foreign capital rather than 'discipline' governments, generates perverse incentives for policymakers and results in inefficient outcomes — making currency crises more rather than less likely.[4] 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.

In our framework, a government that is interested in defending a fixed exchange rate, chooses between policies. Two features of our framework are worth highlighting. First, policies are assumed to be state-dependent. We assume that different policies are 'appropriate' for different states of the world — no policy is intrinsically superior to the other. Therefore, if the government has a very strong foreign reserve situation, the 'appropriate' policies are likely to be very different from the policies that it should pursue when its foreign reserve situation is precarious. Given this state-dependence, policymaking for the government would seem to be a simple matter of matching the 'appropriate' policy to the corresponding underlying state. However, what complicates matters is that the government does not know for sure, the underlying state of the world. This brings us to the second important aspect of our framework. In particular, the government has reliable (even if not perfect) private information about the underlying state of the world. In this framework, we show that with the globalization of capital flows, governmental decision making in developing countries might suffer from inefficiencies. In particular, we argue that, the very attempt to maintain 'market confidence', may result in governments feeling 'compelled' to enact (or persist with) policies that have an adverse impact on the economic environment.

We identify two situations under which this might happen and governments have an incentive to play the 'confidence game'. The first reason why governments play the 'confidence game'

[2] This quote is from Krugman (1998).

[3] Rodrik (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".

[4] Our 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.

arises when priors are skewed in favor of a particular state of the world. So if the priors of the international capital market are that a tight fiscal policy is the correct policy, the government will be 'compelled' to slash budget deficits, even if it had private information that running a temporary budget deficit might be more suitable. By enacting a policy that conforms with the priors of the international capital market, the government signals that it is confident of success and hopes to attract foreign capital. If the government through its policy choice, manages to attract sufficient amount of foreign capital, so as to more than offset the adverse impact of a poorer economic environment. We call this the 'conformity bias' in governmental decision making. In a sense this conformity bias captures 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*." It is quite striking to observe that, the government's attempt to enhance its ability to defend the exchange rate by playing the confidence game, makes it more rather than less vulnerable to a currency crisis. We further show that investment flows have a nonmonotonic relationship with the degree of ex–ante uncertainty about the possibility of success of any given policy. Investment increases as uncertainty decreases until a certain threshold level of uncertainty is reached. A further decrease in uncertainty results in inefficiency and a collapse of capital flows because it results in a 'conformity bias' in governmental decision making.[5]

We then demonstrate another scenario in which a government may mislead foreign investors. Consider the case where priors are not skewed, but that the productivity of the economic environment differs across the two states. 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 since good times are 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 otherwise. We call this the 'good news bias' in government decision making. 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 to minimize the risk of a devaluation.

Do mechanisms that may mitigate the government's incentive to deceive investor and play the confidence game exist? We explore this question by examining the impact of greater transparency on government policy choices. At one level the answer to this question seems straightforward — as argued by Rogoff (1999) 'increased transparency would undoubtedly be useful in achieving more efficient global markets'. Indeed institutions such as the IMF share this belief in the efficacy of greater transparency in ensuring efficient government policy choices. For instance, in response to the Mexican currency crisis, the IMF established mechanisms for greater transparency such as the SDSS and GDSS (see Fischer, 2002). Our analysis suggests that while greater transparency typically does improve matters, there may be some exceptions. Indeed in some cases, it is precisely the increase in public information availability that result in governments having an incentive to play the confidence game — worsening matters. This somewhat striking possibility is in accord with recent work on the social value of public information (Morris and Shin, 2002).

This paper adds to the nascent literature examining various aspects of globalization. Our analysis suggests that if globalization of capital flows proceeds far enough, then governments may have an incentive to play the confidence game — lowering capital inflows and weakening

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

fundamentals. Therefore, with globalization, some countries become more rather than less vulnerable to the threat of devaluation. Our analysis complements other recent work on some of the potential adverse effects of alternative aspects of globalization. For instance, Krugman and Venables (1995) examine the role of a reduction in transport costs on welfare. Cai and Treisman (2005) suggest that heterogeneity in institutional structure across countries, then greater capital mobility may weaken discipline. Mukand and Rodrik (2005) show how inefficiencies may arise when we account for the impact that global informational spillovers on policymaking of neighboring countries.

Furthermore, our work is related to the literature on policy signaling in an open economy.[6] For example, Bartolini and Drazen (1997) study the impact of imposition of capital flows by focusing on the signaling aspect of such a policy choice. The government's decision of whether to impose capital controls is observed by investors, who use it to infer about the future course of such policies. However, in our paper the observed policy choice has no dynamic implications about the future course of policies, since the emphasis over here is on the signaling of private information, and the perverse incentive effects this generates. Finally, this paper is also similar in structure to work by Prendergast and Stole (1996), Majumdar and Mukand (2004), and especially Brandenburger and Polak (1996). Under the assumption that managers care about the current valuation of firms, in the latter paper, there emerges an informational inefficiency similar to the one in this paper. There are several important differences, however. In our model the focus is on the interaction between governmental policy, exchange rates 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 2.1, we set up the benchmark economy and analyze the equilibrium. Section 2.2 elaborates on the basic model and describes a specific application to fiscal policy. Section 3 explores the potential impact of international institutions in increasing transparency. Section 4 concludes with a discussion.

2. The framework

We present the basic framework in two stages. In Section 2.1 we present a stripped down version of the basic model, that has that advantage of presenting our basic results in a transparent way. In Section 2.2, we further explore the model by placing it in the context of government expenditures and deficits.

2.1. The benchmark model

We adapt to a signaling context, the exchange rate framework developed by Morris and Shin (1998). The model highlights the strategic interaction between foreign investors and a government interested in defending an exchange rate peg. The government's ability to defend the exchange rate is a function of the strength of the country's underlying economic fundamentals. Through its policy choice the government has the potential to weaken or strengthen the country's "fundamentals" — thereby either lowering or exacerbating the threat of a currency collapse. The difficulty with policymaking is that there is uncertainty about what constitutes the appropriate policy. An inappropriate policy choice by weakening fundamentals, may increase the threat of an exchange rate collapse. However in the first period, the government

[6] See Drazen (1997) for an excellent survey of the nascent literature on this topic.

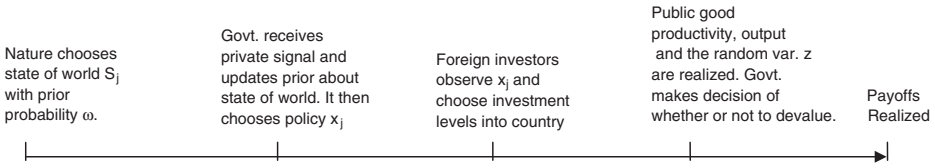

Fig. 1. Timing of the game.

receives a private signal about the appropriate policy choice. The government updates its prior about the appropriateness of alternative policy choices and then chooses a policy. Foreign investors observe the government's policy choice and choose an investment level. Depending on the amount of foreign capital it attracts, as well as the direct impact of the policy on the economic environment, the government decides whether to defend the exchange rate or not (see Fig. 1 for a schematic).

We now describe the features of the model sketched out above in greater detail.

Exchange rates and 'fundamentals': The economy in period t is characterized by a state of economic fundamentals θ_t. A country's economic fundamentals in any period are not exogenous, but rather are influenced by government policy choices, foreign investment, exogenous economic shocks as well as the state of fundamentals in the previous period. Accordingly, we assume that the state of fundamentals in period t, are a function of both the fundamentals inherited from the previous period as well as current national output y_t such that $\theta_t = \theta(\theta_{t-1}, y_t)$, where θ_t is increasing in both the arguments.[7] Therefore, a higher value of θ corresponds to 'stronger' fundamentals. We interpret these economic fundamentals as a proxy for any or all factors that affect a country's ability to defend its exchange rate. For instance, they may be interpreted as being equal to the level of foreign exchange reserves of the government (as in Section 2.2 of the paper), or a country's national income or its level of foreign debt or even the country's overall macroeconomic situation.

An economy's fundamentals matter because they influence the exchange rate. In particular, in the absence of government intervention, a country's exchange rate is an increasing function of its economic fundamentals θ and is given by $f(\theta)$. Accordingly, we assume that the government pegged the exchange rate in period $t-1$ at e^*, where $e^* = 1 \geq f(\theta_{t-1})$ and the exchange rate is defined in terms of the ratio of foreign to domestic currency. The government's ability to defend its exchange rate peg depends on its policy choices.

Government policymaking in an uncertain world: There are two important aspects of policymaking that we want to highlight. First, is the uncertainty inherent in much of policymaking. Second, we are also interested in capturing the state-contingent nature of many policies where different policies are appropriate in different contexts.

We capture both these elements by assuming that while different policies are appropriate for different underlying states of the world, this state of the world is imperfectly known. In the face of this uncertainty, the government chooses a policy x_j from a binary set of policies each of which is an 'appropriate' response to the underlying state of the world S_j, where $j \in \{L,H\}$. Depending on the economic context, this policy can be variously interpreted as a conservative or liberal budget policy, a high or low interest rate or more generally any and all policies

[7] As will soon become clear, this formulation helps capture Obstfeld's (1994) notion that negative shocks can (by weakening an economy's fundamentals) — help trigger devaluations.

which may have a stochastic impact on the economy.[8] For expositional purposes we deliberately keep both the nature and the impact of these policies somewhat abstract — further elaborating in a concrete macroeconomic context only in Section 2.2. Accordingly, we assume that if policy x_j is correctly matched with the appropriate underlying state of the world — then it has a positive impact on the economic environment since it results in public good productivity of G_j. In contrast, if policy x_j is 'inappropriately' matched to the underlying state w_k, then this adversely affects public good productivity, which now equals G_0, where $G_H \geq G_L > G_0 \geq 0$ and $j \neq k$.

Policy success and the role of information: The government's policy decision is made difficult by the fact that when it chooses its policy, even though it has a prior $\omega(=P(S_H))$ that the state of the world is S_H, it does not perfectly know the true underlying state of the world. However, the government receives a private signal s_j, that the unknown state is S_j, where $j \in \{L,H\}$. The *degree of reliability* or the likelihood that the private signal is an accurate reflection of the true shock is ϕ, where $\phi = P(s_H|S_H) = P(s_L|S_L)$. Given this private signal, the government uses Bayes rule to update its priors on the true state. Therefore, if the private signal received is s_H and its degree of reliability is ϕ we have the government's posterior on the state, which is, $P(S_H|s_H) = \frac{\phi\omega}{\phi\omega + (1-\phi)(1-\omega)}$. Similarly, if the government receives the signal s_L we have, $P(S_L|s_L) = \frac{\phi(1-\omega)}{\phi(1-\omega) + (1-\phi)\omega}$.

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. We focus on the case where the degree of reliability of the private signal received by the government ϕ, is greater than that of the prior ω.[9] This case is of interest since it illustrates the potential for conflict between the government and the foreign investors. 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* $1 > \phi > \omega > 1/2$ *then* $P(S_H|s_H) > P(S_L|s_L) > 1/2$.

Therefore conditional on receiving the private signal s_i, the probability that the unknown state is S_i, is always higher when the signal is s_H than when it is s_L. Notice that posteriors are 'unbalanced' because the government's private signal is stochastic and not perfectly reliable (i.e. $\phi < 1$). Assumption I in conjunction with Lemma I gives rise to the following observation.

Observation I. *The government's choice of policy* x_i *when the private signal is* s_i, $i \in \{L,H\}$, *will maximize expected productivity of the economic environment* (*public good*).

[8] So for instance in some states of the world, running a budget deficit may well be the 'appropriate' policy, while in other contexts a fiscally conservative 'balanced budget' may be the correct policy. Similarly, introducing a currency board may the correct policy for a country under some conditions while dollarization may have been appropriate in other contexts. Mukand and Rodrik (2005) give numerous examples of the state and context dependent 'specificity' of policies and their analysis helps generate a plausible accounting of the economic performance across transition economies.

[9] The other possible case is that the degree of reliability of the prior ω is greater than the private signal s_i received by the government i.e. $\omega > \phi > 1/2$. Therefore, quite irrespective of the private signal 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 and there is no potential source of conflict between the government and foreign investors.

Therefore, if the government wants to choose a policy that maximizes the productivity of the public good, it's choice of policy should always be in accordance with its private information.

Government and foreign investors: This choice of policy is important not just because of its impact on the productivity of the economic environment, but also since it has an impact on the government's ability to defend the exchange rate as well as national income. The government's objective function is kept simple, and we assume that while the government derives a value $V>1$ from successfully defending the exchange rate at the pegged level, it also incurs some costs, such that the government's payoff is given by $W_g=V/C$. This formulation captures the notion that the government obtains a lump sum payoff from *not* engineering a surprise devaluation — since it avoids a loss of pride, voter disapproval and even removal from office.[10] This cost of defending the exchange rate is decreasing in the amount of foreign investment and the size of national income and equals $C=Z/[e^{(y_t+\theta_{t-1})}]$, where y_t is total output and $Z>1$ is a random variable drawn from a symmetric single peaked distribution.[11] Therefore taking logs we obtain the government's payoff from successful defense of the exchange rate is given by (similar to Morris and Shin, 1998) $w_g=v-c=v+\theta_{t-1}+y_t-z$.[12] Therefore, observe that the government's payoff from a successful defense of the exchange rate equals $v-c$, which is increasing in the size of the national income and foreign investment. In contrast, the government's payoff from abandoning the fixed exchange rate is zero.

We assume that z is a random variable whose realization takes place just prior to the government's decision to devalue or maintain the exchange rate. As such z is a proxy for all the unexpected exogenous factors that may the government more or less be willing to defend the exchange rate. As a result of this formulation, the probability of devaluation becomes a smooth increasing function of capital inflows — we elaborate on this later. If the payoff that is realized by the government is $v+\hat{\theta}_t \geq \hat{z}$, then the government will successfully defend the exchange rate, otherwise it will devalue and obtain a zero payoff.

Output is a function of the productivity of the public good and the total amount of capital invested (k) in the country by a continuum of foreign investors, and is given by $y=G_j g(k)$, where $g'>0$, $g''<0$. The amount invested in the country is a simple decreasing function of the opportunity cost of capital given by the world rate of interest r, which we denominate in terms of the domestic currency.

The timing: The above benchmark model demonstrates the interaction between foreign investors and the government which pegs the exchange rate in accordance with the prevailing state of fundamentals (see Fig. 1). In the first period, the government receives an informative private signal about the underlying state of the world. Accordingly, the government updates its priors about the likely success of alternative policy choices and implements a publicly observable policy x_j, which affects the returns to foreign investment. Foreign investors observe the policy enacted by the government and choose investment levels. Output is realized and so is the random variable z. As a function of whether w_g is positive or not, the government decides whether to defend the exchange rate or to let it devalue. Finally, the game ends as the government and foreign investors realize payoffs.

[10] In making this assumption we follow a long tradition following Obstfeld (1994, 1996), Ozkan and Sutherland (1995), Sachs et al. (1996) and Morris and Shin (1998) and Angeletos and Werning (2005). de Kock and Grilli (1993) show how a similar formulation may emerge from private sector trigger strategies where the government is punished for deviating from a fixed rate.

[11] This particular formulation is for simplicity and nothing crucial hinges on it — all that is important is that the cost of defending the exchange rate is *decreasing* in the strength of inherited fundamentals θ_{t-1} and the total output.

[12] Accordingly for the rest of the paper, we use lower case Roman numerals to denote natural logarithms.

2.1.1. Confidence and deception: equilibrium analysis

2.1.1.1. The public signal case. We begin by considering the case where the signal received by the government s_j, is publicly observed by foreign investors. The important thing to notice is that the expected productivity of the public good (and hence returns to foreign investment) is higher when the signal received is s_H rather than s_L.

In order to see this let us describe the foreign investor's optimization problem under the assumption that he is atomistic and believes that the government's equilibrium policy strategy $\sigma^*(x_j,s_i)$ is to enact policy x_j when it receives the signal s_i. Then we have,

$$\max_k \; [(1-P(d|S_j, x_j, s_i)) + P(d|S_j, x_j, s_i)\hat{e}_{jt}]P(S_j|s_j)G_j g(k) + [(1-P(d|S_m, x_j, s_i)) + P(d|S_k, x_j, s_i)\hat{e}_{kt}]G_0 g(k) - (1+r)k.$$

Here $P(d|S_m,x_j,s_i))$ is the probability of a devaluation of the currency to some $\hat{e}_t<1$, if the government chooses policy x_j on receipt of signal s_i when the underlying state is S_m. Of course, if there is no devaluation, then the exchange rate remains anchored at the prevailing exchange rate of $e^*=1$.

The investor's first order condition gives the optimal amount of foreign investment when the government's optimal strategy is to pursue policy x_j when it receives signal s_i is given by $k_{ji}^*(P(S_j|s_i)G_j,r)$. Observe that in a world with public information, the amount of foreign investment is increasing in the expected productivity of the public good. This suggests that in a world with public information, there is no inefficiency in government policy choices.

Proposition I. *If there is no private information, then for all $\omega \in (1/2,1]$ and $G_i > G_j$ there exists a unique equilibrium where the government selects policy x_j when the signal is s_j where i, $j \in \{H, L\}$.*

Proof. See Appendix. □

Observe that the higher capital inflows generated when the government enacts policy x_H rather than x_L, may arise due to either of the following reasons. First, the initial skew in the priors (i.e. $\omega > 1/2$), implies that we know from Lemma I that the posteriors are unbalanced and $P(S_H|s_H) > P(S_L|s_L)$. Second, the relative productivity of the public good may also be higher when policy x_H is enacted, since conditional on success, policy x_H is intrinsically more productive than policy x_L, i.e. $G_H > G_L$. 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*, and by ignoring the signal, the government hurts not just the investors, but also itself — by exacerbating the chances of devaluation. Therefore, through its policy choice, the government always maximizes public good productivity. However, in the presence of private information, this alignment of the preferences of the investor with those of the government may break down. We consider this possibility next.

2.1.1.2. Equilibrium with private information. Government policies have a direct impact on the returns to investment, through their effect on the economic environment. However, as we demonstrate below, the influence of government policies goes beyond this direct impact. Since the government has private information about the underlying state of the world, its choice of policy 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 may have an incentive to deceive foreign investors.

Recall our analysis of the economy with no private information. We saw that the expected productivity of policies (and returns to foreign investors) are higher when the policy chosen was x_H rather than x_L, resulting in $k^*_{HH} > k^*_{LL}$. This asymmetry in capital flows across the two policies, is key to our argument, since it gives governments an incentive to deceive investors and enact policies that do not maximize the returns to investment.

To see this clearly, examine the following scenario. Consider the government's payoff from deviation from a proposed truth-telling equilibrium where its policy choice always pursues a policy in accordance with its private signal (maximizes expected public good productivity) i.e. government's equilibrium strategy is $\sigma^*(x_j,s_j)$. In our formulation, if the government successfully manages to defend the exchange rate peg, when its inherited fundamentals equal $\hat{\theta}_{t-1}$, then its payoff is given by $w_{gt}=v-c=v+\hat{\theta}_{t-1}+y_t-z$. In contrast, the government's payoff if it fails to defend the exchange rate, is zero. Now under the assumption that the government's equilibrium strategy is to follow its private signal (i.e. σ^*_{jj}), its payoff from pursuing policy x_L after receipt of s_L is given by,

$$w_g(x_L, s_L; \sigma^*_{jj}) = \psi^L_{LL}[v-\bar{z}+\hat{\theta}_{t-1}+P(S_L|s_L)G_{Lg}(k^*_{LL})]+\psi^0_{LL}[v-\bar{z}+\hat{\theta}_{t-1} + (1-P(S_L|s_L))G_0 g(k^*_{LL})]. \quad (1)$$

Here for brevity, we define $\psi^m_{ji}=[1-P(d|x_j,s_i,G_m)]$, which is the probability of no devaluation occurring when as a function of its equilibrium strategy, the government chooses policy x_j on receiving s_i and realized productivity is G_m. The first term on the right hand side is the payoff if the realization of public good productivity is G_L, while the second term is the government's payoff if policy is inappropriately matched with the underlying state, resulting in public good productivity of G_0.

In contrast, the government's incentive from deviating from the proposed truth-telling equilibrium and choosing policy x_H on receipt of s_L is,

$$w_g(x_H, s_L; \sigma^*_{jj}) = \psi^H_{HL}[v-z+\hat{\theta}_{t-1}+P(S_H|s_L)G_H g(k^*_{HH})]+\psi^0_{LL}[v-z+\hat{\theta}_{t-1} + P(S_L|s_L)G_0 g(k^*_{HH})]. \quad (2)$$

The preceding two equations immediately imply that the government will always have an incentive to deceive foreign investors and deviate from a strategy of always maximizing the productivity of the economic environment, so long as $w_g(x_H,s_L;\sigma^*_{jj}) \geq w_g(x_L,s_L;\sigma^*_{jj})$. On simplifying (see Appendix), we observe that the government does not choose the first best policy because the government fears that by doing so it may have an adverse impact on international capital markets. Foreign investors will 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' can have two sources — first, the skew in the priors (i.e. ω closer to one), and second, public good productivity across the two states. In both these cases, the government's incentive to deceive arises since by enacting x_H, the gain in foreign capital inflows more than offsets the loss in income because of the lower (expected) productivity of the public good. We now elaborate on both these reasons below.

2.1.2. The 'conformity bias' equilibrium

Consider first the possibility of a pooling equilibrium in which the government's incentive to deliberately ignore its private information arises solely because of a skew in its prior. Accordingly

we assume that $G_H = G_L$ and $P(S_H) > 1/2$. In the following proposition, we demonstrate the possibility of existence of such an equilibrium. Proof of this and subsequent propositions are available in the Appendix.

Proposition IIA. *Government behavior in pure strategies is characterized by the following*,

(i) Conformity bias: $\exists a\bar{\omega}$ such that $\forall \omega \geq \bar{\omega}$, we have a pooling Perfect Bayesian equilibrium where the government in its policy choice 'conforms' with the priors of the market and enacts policy x_H, when $G_H = G_L$.

(ii) $\exists a\hat{\omega}$ such that $\forall \omega < \hat{\omega}$ we have a separating equilibrium where the government enacts policy x_i when it receives the private signal s_i.

The intuition for the above proposition is best understood by considering the following scenario. Consider the government's dilemma when it receives the private signal s_L that contradicts its priors about which policy is best. If the government undertakes the policy that maximizes the returns to capital, from Observation I it will choose policy x_L that is in accordance with its private signal. However, since such a policy contradicts its prior, the government (and the investors) are less 'confident' of its eventual success (i.e. posterior closer to 1/2). Therefore, foreign investors are likely to invest a lower amount 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. Therefore, by 'conforming' to the priors of the international capital market, the government hopes to signal confidence about success, and deceives investors into investing a large amount of capital into the country. Of course, such a policy may adversely affect fundamentals and even precipitate an exchange rate devaluation. However, so long as the capital inflows are large enough, it is a worthwhile gamble.

The above result is predicated on the assumption that globalization of capital flows has gone far enough. This is because it is only with sufficient globalization, will the government's ability to attract foreign capital be strong so as to give it an incentive to play the confidence game. Unfortunately for the government, in equilibrium, its incentive to play the confidence game is perfectly anticipated by foreign investors — depressing foreign capital inflows. This has a striking implication: the government's attempt to attract capital to strengthen fundamentals and increase its ability to defend the exchange rate, ends up *increasing* the likelihood of an exchange rate collapse.

This proclivity of the government to play the confidence game, is seen best when we examine the relationship between uncertainty and capital inflows. In what follows, it is useful to keep in mind that in our analysis, equilibrium capital flows and welfare are positively related. We begin by calculating expected capital flows. In a separating equilibrium where the government selects a policy in accordance with its private signal we have to account for the probability of signal s_i being received by the government, i.e. $P(s_H) = \omega\phi + (1-\omega)(1-\phi)$. Then expected capital inflows in the case of a separating equilibrium $Ek^*_{\text{sep}} = P(s_H)k^*_{HH}(\sigma^*_{jj}) + (1 - P(s_H))k^*_{LL}(\sigma^*_{jj})$. Similarly, expected capital inflows in the case of a pooling equilibrium, where the government takes x_H regardless of the private signal received is given by $Ek^*_{\text{pool}}(x_H) = k^*_{HH}(\sigma^*_{Hj})$, where capital flows are a function of the government's equilibrium strategy. We now use this information to graph the relationship between expected capital inflows and changes in the degree of uncertainty in Fig. 2.[13] Observe that Fig. 1 demonstrates a *nonmonotonic* relationship with the

[13] Fig. 2 is drawn for ϕ close to 1 and $\omega \in [0, \phi)$ and $G_H = G_L$.

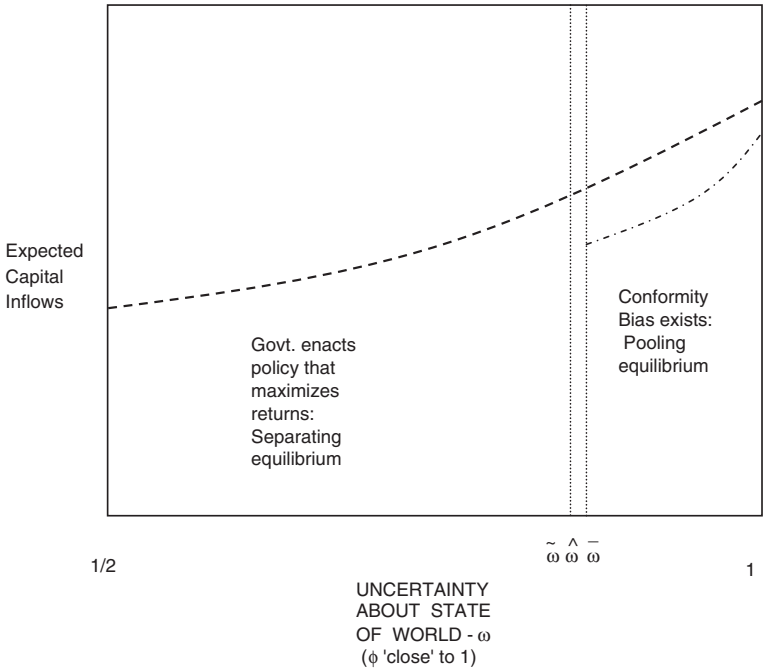

Fig. 2. Uncertainty and the "conformity bias".

degree of uncertainty about the underlying state of the world. When uncertainty about the state of the world is low enough, the government's equilibrium strategy maximizes the returns to investment. As this uncertainty comes down (i.e. ω decreases), the prior information available to the government improves and the government's policy choice is more likely to be successfully matched to the underlying state. This stimulates investment. Since over this range, the government has no incentive to deceive, ex–ante capital inflows rise with a decrease in uncertainty.

However, if uncertainty decreases beyond a threshold $\bar{\omega}$, we have a different scenario. The government now switches its equilibrium strategy. It now has an incentive to ignore its private information, and chooses policy x_H 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. Further decreases in uncertainty about the state of the world, implies that even if the government always chooses policy x_H, it is (in expected terms) more likely to be successful. Therefore investment gradually rises. However, investment remains lower than what it would have been if there was no conformity bias pooling equilibrium.

2.1.3. The 'good news' bias equilibrium

Further, we identify a second set of parameters for which the government has an incentive to play the 'confidence game'. In particular, examine the case where international capital markets do not expect one policy as more likely to be 'appropriate' than the other i.e. priors are balanced such that $P(S_H)=P(S_L=1/2)$. We demonstrate that even in this case, so long as the relative productivity of the public good differs across the states (i.e. $G_H > G_L$), we have a pooling equilibrium in which

the government ignores its private information. We call this the *good news bias* in governmental decision making.

Proposition IIB. *Government behavior in pure strategies is characterized by the following*,

(i) Good news bias: $\exists a\bar{G}_H$ *such that* $\forall G_H \geq \bar{G}_H$, *we have a pooling Perfect Bayesian equilibrium where the government in its policy choice enacts the policy* x_H, *when* $\omega = 1/2$.

(ii) $\exists a\bar{G}_H$ *such that* $\forall G_H < \bar{G}_H$ *we have a separating equilibrium where the government enacts policy* x_i *when it receives the private signal* s_i, *where* $G_H \in [G_L, \bar{G}_H)$ *and* $\omega = 1/2$.

The intuition for the above result is simple. The government is aware that capital inflows will be higher and it will be easier to defend the exchange rate if foreign investors believe that the economy is likely to pick up and good times are ahead. Therefore through its choice of policy x_H, the government attempts to signal to foreign investors that it expects productivity of the public good to be high (i.e. G_H) rather than low.[14] This results in a pooling equilibrium driven by a 'good news' bias. Once again since in a 'good news bias' equilibrium, the government does not utilize its private information, the capital inflows are depressed — weakening fundamentals and increasing the likelihood of a currency collapse.

In the benchmark model that we have developed, we have not elaborated on the nature and economic context of policies that may affect private returns. This had the merit of keeping the analysis relatively transparent, and also facilitated analytical disentangling of the 'conformity bias' from the 'good news bias' — in the process demonstrating how both these effects could independently result in inefficient policy choices. This is useful since in many real world applications, while both these effects may be present, they are difficult to distinguish and indeed may also be working in opposite directions. This is brought home when we apply our framework to throw light on aspects of some recent currency crises.

2.2. The extended framework: application to balanced budgets

In his commentary on the spate of currency crises that occurred in the nineties, Krugman (1999) suggests that governments in developing countries interested in maintaining their exchange rate have an incentive to play the confidence game. In particular he suggested that the preoccupation with following 'sound' economic policies such as reduced government spending and balanced budgets, may not only hurt fundamentals but may even precipitate currency crises. In this section we sketch a simple application of the framework developed in the previous section by describing a stripped down model of government fiscal policymaking.

A government's choice of an aggressive or conservative fiscal policy is a function of its foreign exchange earnings which can be low R_L or high R_H, where $R_H > R_L$.[15] If foreign exchange earnings are expected to be high, then higher government expenditure strengthens the economy

[14] Of course, if the productivity of G_H rises and becomes much higher than G_L, though the government will continue to pool, any inefficiency will have disappeared.

[15] The foreign exchange earnings can be expected to be higher or lower for any of a variety of reasons — change in terms of trade of some export good or any stochastic shock to the level of foreign exchange reserves. Alternatively, we can assume that these foreign exchange earnings are drawn from a distribution, since it allows for the possibility, that even if the foreign exchange reserve situation is quite comfortable, under some contingencies, a large unexpected shock can precipitate a devaluation. However, we already capture this effect by making z drawn from a continuous distribution.

while if foreign exchange earnings are expected to be low, then a conservative low expenditure policy is prudent. We now elaborate.

In particular, in accordance with Krugman (pp. 112, 1999) and Rodrik's (1999) recounting of currency crises in the nineties, for the remainder of this section we assume that the priors of the international capital market are skewed in favor of the conservative fiscal policy being as more likely to be appropriate, such that $\omega = P(R_L) > 1/2$. Government policymaking consists of choosing a level of expenditure which be high (x_H) or low ($x_L = 0$) and results in a corresponding high (G_H) or low (G_L) public good productivity such that output is given by $y = G_j k^{\alpha}$. We assume that any government expenditure x_{jt-1} incurred in period $t-1$ that is not covered by the stochastic foreign exchange earnings R_{kt} in period t, will be covered by either a running down of existing foreign exchange reserves or a tax on foreign capital (through devaluation) in the next period. This implies that the government's two-period budget constraint is given by $x_{jt-1} = R_{kt} + \tau y_t$ where τ is the implicit tax on output as a result of devaluation. Accordingly, a conservative fiscal policy entails low government expenditure which is consistent with a balanced budget in each period. In contrast, an aggressive fiscal policy entails high government expenditure which results in a temporary budget deficit, that has to be balanced by next period. The appropriateness of either an aggressive or conservative fiscal policy depends on a government's stochastic budgetary situation (itself a function of the stochastic foreign exchange earnings). If the foreign exchange earnings are expected to be 'high' R_H then x_H is the 'appropriate' policy; if earnings are expected to be 'low' R_L, then it is x_L, where we assume $R_H \geq x_H > R_L = x_L = 0$.[16] We ensure this by assuming that $(\alpha P(R_H|s_H) G_H)^{\frac{1}{1-\alpha}} - (\alpha P(R_L|s_H) G_H)^{\frac{1}{1-\alpha}} \geq (1+r) x_H$, where the equality holds when $\omega = P(R_L) = \phi$, where $\phi \to 1$. This parametric restriction is a sufficient condition to ensure that on receipt of signal s_H the government's foreign exchange reserves (and hence payoff) increase to a greater extent when the government chooses x_H, than when it chooses x_L. Finally, at the time of making its policy decision, the government receives a private signal s_j about the expected foreign exchange earnings R_j.[17]

Therefore, the government faces a trade-off. On the one hand, high government expenditure x_H, by boosting public good productivity, has the potential to attract capital inflows and thereby strengthen fundamentals (i.e. foreign exchange reserves). On the other hand, higher public expenditure may adversely effect the returns to investment and dampen capital flows, if it increased the possibility of devaluation. Of course, this is more likely if the government's budgetary prognosis was bleak and expected foreign exchange earnings failed to materialize. Similarly, choice of policy x_L has the advantage of keeping expenditure low. However, such a policy is also likely to keep foreign capital inflows restricted to a modest level, with the currency remaining vulnerable to a bad shock to the foreign exchange situation (i.e. low realization of R_t).

[16] The parallel between the previous framework and the present application become readily apparent when we observe that in fundamentals are given by $\theta_t = (\hat{R} - x_j) + \hat{\theta}_{t-1} + k_t$ where $\hat{R}$ is a given realized value of foreign exchange reserves. Once again, there is no devaluation so long as $v + \hat{\theta}_t \geq z$, where the probability of a successful defense is increasing in the size of capital inflows.

[17] This signal can be a privately observed level of foreign exchange reserves which is positively correlated to future foreign exchange earnings or some private information about the future trajectory of exchange rate earnings. Alternatively, the government may have private information about a looming political crisis for which it will have to make a contingent expenditure and draw on reserves.

Keeping this in mind, consider the payoffs to the government from its equilibrium strategy σ_{Lj}^*. The payoff on receipt of signal s_H equals:

$$w_g(x_L, s_H; \sigma_{Lj}^*) = \psi_{LH}^L[v - z + \hat{\theta}_{t-1} + k_{Lj}^*] + \psi_{LH}^H[v - z + \hat{\theta}_{t-1} + k_{Lj}^*].$$

Here the probability of *no* devaluation when choice of policy x_j on receipt of s_i when foreign exchange earnings are R_k, is given by ψ_{ji}^k. The first (second) term on the right hand side is the government's payoff from defending the exchange rate when foreign exchange earnings turn out to be $R_L(R_H)$. Recollect that in our formulation, the government's payoff if the currency peg collapses is zero. In contrast, the government's payoff from deviating from such an equilibrium and enacting x_H on receipt of s_H is given by (with out-of-equilibrium beliefs given by μ):

$$w_g(x_H, s_H; \sigma_{Lj}^*) = \psi_{HH}^H[v - z + \hat{\theta}_{t-1} + k_{\mu}^*] + \psi_{HH}^L[v - z + \hat{\theta}_{t-1} + k_{\mu}^*].$$

Therefore for a pooling equilibrium to exist, there should exist parameters such that $w_g(x_L, s_H; \sigma_{Lj}^*) \geq w_g(x_H, s_H; \sigma_{Lj}^*)$. In the following Proposition we demonstrate that if the priors of the international capital market are sufficiently skewed in favor of the conservative balanced budget policy x_L, then such a policy is always enacted.

Proposition III. *If priors are sufficiently skewed in favor of the pessimistic foreign exchange earnings forecast R_L, then there exist parameters such that there is a pooling perfect Bayesian equilibrium, where the government enacts the conservative low expenditure policy.*

The intuition for the above result is similar to the preceding section. Consider the dilemma facing the government when ω is sufficiently close to one. It receives information that its foreign exchange situation is expected to be good. In such a scenario, an activist fiscal policy x_H, which may entail running a temporary budget deficit, will not only increase economic productivity but may also increase the government's ability to defend the exchange rate peg. However such a policy, even if socially optimal, also entails some risks for the government. In particular, such a policy contradicts the priors of the international capital market — which are skewed in favor of the conservative economic policy as being the appropriate one (since foreign exchange earnings are expected to be low). Indeed given that such a policy contradicts the common priors, the choice of policy x_H may result in foreign investors (correctly) inferring that the government is likely to be somewhat less confident of the eventual success of such a policy, and accordingly invest less. The government is averse to lower foreign capital inflows since by lowering foreign exchange reserves, it increases the country's vulnerability to an unexpectedly large negative shock (i.e. low realization of exchange earnings $\hat{R}_L$). In turn, precisely to avoid 'spooking' the international capital market, the government may prefer to conform with the priors of the international capital market and maintain a conservative policy x_L. As a result the economy will be stuck with relatively modest returns and remain vulnerable to devaluation in the future.

3. Transparency and the IMF

In a world with private information, we observed that governments may have an incentive to mislead foreign investors. From an operational policy perspective, this immediately gives rise to the issue of whether we can think of mechanisms which may help mitigate this inefficiency.

Perhaps the simplest such mechanism would be if we could come up with an institution that would credibly reveal the government's private information into the public domain.[18] However, it is far from clear whether governments can credibly reveal the private information they receive under all circumstances.[19] Indeed this need for greater transparency and improved data dissemination was brought home in the aftermath of the Mexican currency crisis, where the government was believed to have concealed information on the level of foreign reserves. In response to the Mexican currency crisis, pressure was put on the IMF to create precisely such an information revealing institution (see Fischer (2002) for a discussion). This resulted in the introduction in 1996 of the Special Data Dissemination Standard (SDSS) and the General Data Dissemination Standards (GDSS) by the IMF. Here we discuss the extent to which such measures are likely to be effective in decreasing (or even eliminating) the likelihood of the 'confidence game' discussed in the previous section.

We now augment the benchmark model to allow for an additional player, namely an international financial institution (such as the IMF or the World Bank). We assume that this international institution acquires independent information about the underlying unknown state of the world in the country in question. The issue of interest is whether this international institution (the 'outside' party) by committing itself to publicly revealing this information, is likely to *reduce* or eliminate the government's incentive to engage in the confidence game. The answer to this depends on the 'reliability' (ϕ_o) of the signal (s_j^o) received by the 'outsider' institution as compared to the common prior (ω) about the country's state of the world.[20] Since the international institution's information is acquired independently of the country's government, the public announcement of this information by the outside institution will result in an updated common posterior, ω_{oj} where $\omega_{oj}=P(S_H|s_j^o)$ is the new updated common prior.

Suppose an 'outside' party such as the IMF received the signal s_H^o and publicly revealed this information. Then the government and foreign investors use this information to arrive at an updated common prior ω_{oH}. To begin with, consider the case where the reliability (ϕ) of the private signal received by the government is *less* than this updated common prior i.e. $\omega_{oH}>\phi>1/2$. Observe that in this case, quite irrespective of whether the government receives the private signal s_L or s_H, the posterior is always unbalanced in favor of the state being S_H, i.e. $P(S_H|s_H,\omega_{oH})>P(S_H|s_L,\omega_{oH})>1/2$. Since the fact that posteriors are balanced in favor of S_H is common knowledge between both investors and the government, the latter

[18] In an earlier version of this paper, we argued that one such mechanism may involve delegating decision making authority to an ideologically contrarian policy maker (as in Cukierman and Tommasi (1998). Since credibility of a policy is a function of the policy–policymaker pair, we showed that a government that is moderately ideologically predisposed against the policy favored by international capital markets, is likely to credibly pursue a policy in accordance with its private signal.

[19] One possible mechanism would involve costly signaling — addressed by Rodrik (1989), in the context of trade liberalization. He argues that credible policy reform may require going inefficiently overboard and much further than it would have in the absence of a credibility problem.

[20] There is no reason why the government's private information set should *always* coincide with the international financial institution's. This is perhaps easier to see if we recognize that the set of factors that influence the government's ability to defend the exchange rate are multi-faceted, and S_k can appropriately be thought of as being a vector with several components. For instance, the government's ability to successfully defend the exchange rate is a function of a variety of circumstances — the foreign exchange earnings and the level of reserves, the threat of riots, assassinations (as in the Colosio assassination in Mexico in 1994) or any other unexpected political imperatives, in addition to information about the evolution of the economy. Clearly, the IFI's ability to acquire, assimilate and credibly reveal some kinds of information (e.g. level of foreign reserves), is easier than others (e.g. threat of socio–political unrest).

will find it optimal to implement policy x_H. Clearly in this case, the public announcement of information by the international institution *eliminates* the government's incentive to deceive foreign investors and play the 'confidence game' — and thereby improves national income and welfare.

However, this is not the only possibility. Consider an alternative scenario, where the private signal received by the government remains more reliable than the updated common posterior that results from the public announcement that the international institution received s_H^o, i.e. $\phi > \omega_{oH} > 1/2$. However, if the government's private signal remains more reliable, then its incentive to deceive foreign investor's through its choice of policy remains (see Proposition II).

Our above analysis suggests that even if public revelation of information by an international institution is not sufficient to eliminate the government's incentive to deceive in all instances, it is unlikely to worsen matters. Unfortunately, this is not quite true. Under some circumstances, it is possible to go even further and argue that the public release of information by the outside international institution may even *worsen matters*.

To see this recall our analysis from Section 2.1. Here the government's incentive to play the confidence game is highest when the priors of the government and foreign investors are *sufficiently biased* in favor of the state being S_H. This suggests that if the public release of information skews beliefs about the underlying state sufficiently, it may result in the government having an incentive to deceive and thereby lowering expected national income. To see this let us re-examine Fig. 1. Consider an initial situation where $\omega = \tilde{\omega} < \bar{\omega}$, where $\tilde{\omega} = \bar{\omega} - \epsilon$ where ϵ is positive and 'close' to zero. In this range there is no conflict in the interests of the foreign investors and the government — as a result the government chooses the policy that maximizes public good productivity. However, now consider a situation where the international institution acquires information s_H^o that the state is S_H. Since this information is publicly revealed, suppose that it results in an updated common prior $\tilde{\omega}_{oH} > \bar{\omega}$. This updated common prior is now further skewed. If this skew is sufficiently large, so long as $\phi > \omega_{oH}$, it enters the range where the government has an incentive to play the confidence game. We know this from Proposition II, since this public revelation of information by the international institution, by skewing the common beliefs sufficiently, results in a discontinuous change in a government's optimal strategy. Over this range the government has a clear incentive to play the 'confidence game' and will enact policy x_H, quite irrespective of the information that it receives. Expected capital flows (and welfare) drop discontinuously with the change in optimal strategy.

We summarize the above discussion in the following proposition.

Proposition IV. *If $\phi > \phi_{oj}$, $\exists \phi > \omega_o \geq \bar{\omega} > \tilde{\omega}$, such that a public release of information by the international financial institution will reduce expected capital inflows and result in the government's optimal strategy, to switch from a truth-telling separating equilibrium to a pooling equilibrium.*

This result on the welfare impact of greater transparency should be interpreted cautiously. All that we argue is that an increase in publicly available information has the *possibility* of worsening matters. An increase in the public availability of information has two effects. First, more information, makes it easier for the government to arrive at an accurate assessment of the underlying state — improving ex–ante welfare. However, more public information has a second effect — namely, on the government's optimal policy choice. As we saw in the

preceding discussion — it is this latter effect of an increase in information on the government's optimal policy choice that is ambiguous. Over some parameter values, an increase in information may help prevent the government from having an incentive to play the confidence game — improving welfare. However, over other parameters, an increase in information, may engender a situation where the government has an incentive to play the confidence game — which, in equilibrium, has a negative effect on national output. While our above argument is quite striking, it remains to be examined how applicable this insight is to other contexts and more general environments. Recent work (in a somewhat different framework) by Morris and Shin (2002) suggests that it may well be as they argue that "if the agents have access to some private information, it is not always the case that greater precision of public information is desirable".

Therefore, while institutions that encourage greater transparency can be expected to resolve inefficiencies in governmental policy choices, this may not always be so — indeed, as our analysis above suggested, in some circumstances it may even worsen matters. As such, we should not expect greater transparency to be some kind of universal panacea, to tackle inefficiencies in government decision making. Rather, it should be part of an overall package that encourages greater accountability in government decision making — by making governmental lengthening time horizons.

4. Discussion

The factors underlying globalization are multifaceted. Globalization may be a function of conscious policy choice, as when governments lower barriers to capital flows, or it may be a result of technological and institutional changes — as in the case of greater information availability and transparency. Clearly this globalization of capital flows and information availability has yielded many economic benefits. Indeed, the threat of capital flight itself has the potential to be an effective disciplining device (Obstfeld, 1998). However, our analysis suggests that these forces of globalization, while providing opportunities, also bring with it some risks. For instance, it is only if the globalization of capital flows proceeds far enough, and governments have the possibility of attracting foreign capital, will they have an incentive to play the confidence game. The globalization of information and greater transparency, increases investment and often reduces the government's incentive to make inefficient policy choices. However, once again, they may be cases where this globalization of information may worsen matters.

This suggests that at least to some extent, the beneficial impact of the globalization of capital flows (say due to efficiency in resource allocation) may be dampened, due to the greater incentive to play the confidence game. Our results should throw a cautionary note to the wave of economic reforms that have been enacted worldwide.[21] Strikingly enough, our analysis suggests that a change in the degree of 'consensus' (increasing skew in priors), coupled with the prospect of attracting capital from international capital markets may have been responsible for this enthusiasm for economic reform in at least a few instances. Indeed Krugman (1998), Radelet and Sachs (1998) and Stiglitz (2002) have all argued that Washington and the IMF have made the mistake of

[21] 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 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."

advocating policies 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 may feel 'disciplined' into enacting such inefficient policies.

It is important to observe that our 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. The establishment of political parties is likely to result in the time horizons of governments increasing — such that the standard reputational concerns that mitigate these inefficiencies become operational.

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Appendix A

Note: In what follows we make use of the following: (i) conditional on receiving s_j, expected productivity of the public good differs across the two states, because either (a) $\omega > 1/2$, (b) $G_H > G_L$. (ii) In any equilibrium, higher capital flows, implies higher $\hat{\theta}_t$. (iii) z is drawn from a continuous distribution on the real line with cdf $F(z)$, and is realized after the government's policy choice. This implies that since a devaluation of an exchange rate takes place only if $v + \hat{\theta}_t < \hat{z}_t$, we have ψ_{ij} bounded away from zero or one. Higher $\hat{\theta}_t \Rightarrow$ lower probability of devaluation ψ_{ij} and higher expected payoff to the government. This has an important implication for what follows — namely, an increase in capital inflows, will ceteris paribus, result in a higher probability of the government carrying out no devaluation.

Proposition I. The argument is straightforward. So long as $\phi > \omega$, we know from Assumption 1 that $P(S_j|s_j) > P(S_j|s_k)$ where $j \neq k$. Therefore, if government does not follow signal, expected productivity of the public good is given by $P(S_j|s_k)G_j$ and investor will optimally choose k_{ij}^* which is (from Observation 1) is strictly lower than the amount of capital invested if the government chose to follow its signal. Observe that ceteris paribus, fundamentals θ_t, are increasing in the total volume of capital inflows. This immediately implies that both the probability of no devaluation, as well as the payoff contingent on no devaluation is increasing in capital inflows. Therefore, when the signal is public, choosing a policy that contradicts the signal, lowers expected productivity of the public good and adversely affects capital flows and fundamentals. Therefore, in an equilibrium, an optimizing government will always prefer to pursue a policy in accord with its public signal.

Proposition IIA and IIB. We begin by examining the parameters under which there exists a truth-telling separating equilibrium, where a government chooses x_j on receipt of s_j, i.e. the government's equilibrium strategy is σ_{jj}^*. In such an equilibrium, the government's payoff from pursuing policy x_L after receipt of s_L is given by,

$$w_g(x_L, s_L; \sigma_{jj}^*) = \psi_{LL}^L[v - \bar{z} + \hat{\theta}_{t-1} + P(S_L|s_L)G_{Lg}(k_{LL}^*)] + \psi_{LL}^0[v - \bar{z} + \hat{\theta}_{t-1} + (1 - P(S_L|s_L))G_0 g(k_{LL}^*)].$$

In contrast the government's incentive from deviating from the proposed truth-telling equilibrium and choosing policy x_H on receipt of s_L is,

$$w_g(x_H, s_L; \sigma_{jj}^*) = \psi_{HL}^H[v-\bar{z}+\hat{\theta}_{t-1}+P(S_H|s_L)G_Hg(k_{HH}^*)]+\psi_{LL}^0[v-\bar{z}+\hat{\theta}_{t-1} + P(S_L|s_L)G_0g(k_{HH}^*)].$$

Therefore, a truth-telling separating equilibrium exists, when $w_g(x_H,s_L,\sigma_{jj}^*) \leq w_g(x_L,s_L,\sigma_{jj}^*)$. Rearranging the two preceding equations, we obtain the following inequality:

$$[v-\bar{z}+\theta_{t-1}](\psi_{HL}^H(\sigma_{jj}^*)+\psi_{HL}^0(\sigma_{jj}^*)-\psi_{LL}^L(.)-\psi_{LL}^0(.)) + P(S_H|s_L)[\psi_{HL}^H G_Hg(k_{HH}^*)-\psi_{LL}^0G_0g(k_{LL}^*)] \leq P(S_L|s_L)[\psi_{LL}^L G_Lg(k_{LL}^*)-\psi_{HL}^0G_0g(k_{HH}^*)]. \quad (3)$$

It is easy to see that there exist parameters such that this inequality is true. First, we examine the conformity bias. We ensure this by assuming that $G_H=G_L$ and there is no possibility of the 'good news' bias. If $\phi \to 1$ and $\omega \to 1/2$, then $P(S_L|s_L) \to 1$ and $k_{HH}^* \approx k_{LL}^*$. Since we can choose $v-\bar{z}+\hat{\theta}_{t-1}$ to be 'small', it is easy to check that this implies that there exists a large set of parameters for which $L_{HS}<R_{HS}$. Also observe that the posterior $P(S_L|s_L)$ is decreasing in ω, i.e. $\frac{P(S_L|s_L)}{d\omega}<0$.

Further, observe that if ω is close enough to one, i.e. $\phi>\omega \to 1$, then $P(S_H|s_H) \to 1>P(S_L|s_L) \to 1/2$. This immediately implies that $k_{HH}^*>k_{LL}^*$. Since $\hat{\theta}_t$ is ceteris paribus, increasing in capital flows, this asymmetry in capital inflows, in turn implies that $\psi_{HL}^H>\psi_{LL}^L$. Ipso facto, this immediately suggests that there exist parameters such that $LHS>RHS$. Furthermore, given that both the LHS (and RHS) are continuous and monotonic increasing (decreasing), we have a cut-off $\hat{\omega}$ such that for all $\omega<\hat{\omega}$ there exists a truth-telling separating equilibrium.

Similarly, consider the condition for a pooling equilibrium at x_H for the case where $G_H=G_L$. For a pooling equilibrium to exist, there must exist parameters such that $w_g(x_H,s_L,\sigma_{Hj}^*) \geq w_g(x_L, s_L,\sigma_{Hj}^*,\mu)$, where on observing x_H, the foreign investor's out-of-equilibrium beliefs about the private signal received by the government, are given by μ. This gives rise to:

$$[v-\bar{z}+\theta_{t-1}](\psi_{HL}^H(\sigma_{Hj}^*)+\psi_{HL}^0(\sigma_{Hj}^*)-\psi_{LL}^L(\sigma_{\mu}^*)-\psi_{LL}^0(\sigma_{\mu}^*)) + P(S_H|s_L)[\psi_{HL}^H G_Hg(k_{Hj}^*)-\psi_{LL}^0G_0g(k_{L\mu}^*)] \geq P(S_L|s_L)[\psi_{LL}^L G_Lg(k_{L\mu}^*)-\psi_{HL}^0G_0g(k_{Hj}^*)]. \quad (4)$$

Once again, observe that if $\phi \to 1$ and $\omega \to 1/2$, then $P(S_L|s_L) \to 1$ and $P(S_H|s_L) \to 0$. This immediately implies that if we pick a z such that $(v-\tilde{z}+\theta_{t-1})$ is 'small' and negative, we will obtain $LHS<RHS$. Now once again simple comparative statics on ω show that the inequality reverses itself for $\phi>\omega \to 1$. Here, we have $P(S_H|s_H) \to 1>P(S_L|s_L) \to 1/2$. Further observe that since $\omega \to 1$ and the consequent unbalanced posteriors, we have $k_{Hj}^*>k_{L\mu}^*$, even if the investor's out-of-equilibrium belief on observing x_L is that the government received the private signal s_L. This implies that $g(k_{Hj}^*)>g(K_{L\mu}^*)$, which given that θ_t is an increasing function, implies that $\psi_{HL}^H>\psi_{LL}^L$. Since in addition $P(S_H|s_L) \approx P(S_L|s_L) \to 1/2$, there exist parameters such that $LHS>RHS$. Given continuity of the underlying functions, there exists a pooling equilibria for all $\omega \geq \bar{\omega}$.

Finally, we want to evaluate whether $\bar{\omega}$ is greater, less than or identical to $\hat{\omega}$. For convenience we rewrite Eq. (3) above to obtain a condition for a deviation from a truth-telling separating equilibrium:

$$A_1 + P(S_H|s_L)[\psi^H_{HL} G_H g(k^*_{HH}) - \psi^0_{LL} G_0 g(k^*_{LL})] - P(S_L|s_L)[\psi^L_{LL} G_L g(k^*_{LL}) - \psi^0_{HL} G_0 g(k^*_{HH})] \geq 0. \tag{5}$$

Here $A_1(\sigma^*_{jj}) = [v - \bar{z} + \theta_{t-1}](\psi^H_{HL} + \psi^0_{HL} - \psi^L_{LL} - \psi^0_{LL})$. Similarly, for a pooling equilibria at x_H, we rewrite Eq. (4) above, where $A_2(\sigma^*_{Hj}) = [v - \bar{z} + \theta_{t-1}](\psi^H_{HL} + \psi^0_{HL} - \psi^L_{LL} - \psi^0_{LL})$ as,

$$A_2 + P(S_H|s_L)[\psi^H_{HL} G_H g(k^*_{Hj}) - \psi^0_{LL} G_0 g(k^*_{L\mu})] - P(S_L|s_L)[\psi^L_{LL} G_L g(k^*_{L\mu}) - \psi^0_{HL} G_0 g(k^*_{Hj})] \geq 0 \tag{6}$$

Now we are interested in comparing Eq. (5) with Eq. (6). First, we can always choose $v, \bar{z}$ so as to ensure that A_1 and A_2 are 'negligible'. Now examine both these inequalities as we increase ω from 1/2. Observe that since $k^*_{HH} > k^*_{Hj}$, the first inequality that will be violated is the truth telling condition (5). Given that we can always choose G_0, small enough, this immediately suggests that $\hat{\omega} > \bar{\omega}$.

Similarly, consider the case of the good news bias. Here we assume $\omega = 1/2$ and $G_H > G_L$ so as to ensure that there is no skew in the priors. If $\omega = 1/2$, then we can always pick a ϕ large enough to ensure that $LHS \leq RHS$. Now having pinned ϕ down we are still free to choose G_H. Using an argument similar to the one used earlier which utilizes the continuity and monotonicity of the *LHS* and *RHS* of Eq. (4), we can show that as we increase G_H, there exists a pooling equilibria where the government enacts x_H, for all $G_H \geq \bar{G}_H$.

Proposition III. We now sketch the Proof of Proposition III, which in structure is similar to the preceding analysis.

For a pooling equilibrium, we need to demonstrate whether there exist parameters such that $w_g(x_L, s_H, \sigma^*_{Lj}) \geq w_g(x_H, s_H, \sigma^*_{Lj})$. From the discussion in the text, we have,

$$w_g(x_L, s_H; \sigma^*_{Lj}) = \psi^L_{LH}[v - \bar{z} + \hat{\theta}_{t-1} + k^*_{Lj}] + \psi^H_{LH}[v - \bar{z} + \hat{\theta}_{t-1} + k^*_{Lj}]. \tag{7}$$

The government's payoff from deviating from such an equilibrium and enacting x_H on receipt of s_H is given by (with out-of-equilibrium beliefs given by μ):

$$w_g(x_H, s_H; \sigma^*_{Lj}) = \psi^H_{HH}[v - z + \hat{\theta}_{t-1} + k^*_{\mu}] + \psi^L_{HH}[v - \bar{z} + \hat{\theta}_{t-1} + k^*_{\mu}]. \tag{8}$$

Rearranging the preceding equations, we obtain,

$$(v - \bar{z} + \hat{\theta}_{t-1} + k^*_{Lj})[\psi^L_{LH} + \psi^H_{LH}] - (v - \bar{z} + \hat{\theta}_{t-1} + k^*_{\mu})[\psi^H_{HH} + \psi^L_{HH}] \geq 0.$$

In the two preceding equations, since the production function is Cobb–Douglas, $k^*_{Lj} = [\alpha\omega G_L]^{1/(1-\alpha)}$ and $k^*_{\mu} = [\alpha\mu G_H]^{1/(1-\alpha)}$, where μ are the out-of-equilibrium beliefs of the investor — on seeing a deviation to x_H, we assume that the investor believes that the government received the s_H signal. Now, recollect that the government will not devalue so long as $v + k_t + \hat{\theta}_{t-1} \geq \bar{z}$. Now consider $Z_1 - Z_2 \geq 0$, where $Z_1 = (v - z + \hat{\theta}_{t-1} + k^*_{Lj})[\psi^L_{LH} + \psi^H_{HL}]$ and $Z_2 = (v - z + \hat{\theta}_{t-1} + k^*_{\mu})[\psi^H_{HH} + \psi^L_{HH}]$. We compare Z_1 with Z_2 by first comparing pairwise the two terms in the square brackets. Here $\psi^L_{LH} = P(v + \theta_t \geq \bar{z})$ is increasing in both v and θ_t. Now $\theta_t = R_L - x_L + \hat{\theta}_{t-1} + k^*_{Lj}$. Similarly, $\psi^H_{HH} = P(v + \theta_t \geq z)$ where $\theta_t = R_H - x_H + \hat{\theta}_{t-1} + k^*_{\mu}$. Observe that

in *expected* terms, this implies that $\psi^L_{LH} \geq \psi^H_{HH}$ iff $R_L - x_L + k^*_{Lj} \geq R_H - x_H + k^*_{\mu}$, which equals $k^*_{Lj} > k^*_{\mu}$ since $x_j = R_j$ for $j \in \{L,H\}$. Likewise, $\psi^H_{HL} = P(v + \theta_t \geq \bar{z})$ where $\theta_t = R_H - x_L + \hat{\theta}_{t-1} + k^*_{Lj}$ and $\psi^H_{HH} = P(v + \theta_t \geq \bar{z})$ where $\theta_t = R_H - x_H + \hat{\theta}_{t-1} + v + k^*_{\mu}$. Once again observe that $\psi^H_{LH} \geq \psi^H_{HH}$ if $k^*_{Lj} > k^*_{\mu}$. Therefore, not only is the size of $Z_1 - Z_2$ a function of the gap between k^*_{Lj} and k^*_{μ}, but further if $k^*_{Lj} > k^*_{\mu}$, then we have a sufficient condition to ensure that $Z_1 > Z_2$.

Moreover, notice that all the ψ^k_{ij} above, are increasing in the size of capital inflows. Further, notice that since $dZ_1/d\omega > 0$, and $dZ_2/d\omega < 0$, the left hand side above is increasing with ω and we have $\frac{d(Z_1 - Z_2)}{d\omega} > 0$. Now we need τ to be large enough to ensure that if devaluation occurs, then there is a sufficient adverse impact on capital flows. Keeping in mind that $P(R_H|s_H) \to 1/2$ for $\omega \to \phi$, when ϕ is close to one, we ensure this by checking to see whether the following condition is satisfied: $1/2[\alpha\hat{\mu}G_H]^{\frac{1}{1-\alpha}} + 1/2[(1-\tau)\alpha P(R_H|s_H)G_H]^{\frac{1}{1-\alpha}} < [\alpha\omega G_L]^{\frac{1}{1-\alpha}}$. This holds so long as $x_H > G_H(\alpha P(R_H|s_H)G_H)^{\frac{1}{1-\alpha}}\left[1 - \frac{2^{1-\alpha}\omega G_L}{\mu G_H}\right]$. Observe that if $\omega \to \phi$ and $\phi \to 1$, we have $(\omega/\hat{\mu}) \to 1$. Further since $G_H > G_L$, this implies that the above inequality should be satisfied for a large number of parameter values. We further can check to see that upper bound on x_H imposed by assumption is not violated for $G_H > G_L$. Hence, as $\omega \to 1$, we have $k^*_{Lj} > k^*_{\mu}$. This directly implies that there exists a non-empty set of parameters such that our pooling equilibrium holds, where the government prefers x_L.

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