Resolving the Credibility Problem of an Honest Government: A Case for Foreign Investment Subsidy

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Abstract

We develop a simple model of direct foreign investment where the host country government cannot credibly signal its honest intention such as to stick to the contracted tax rate. The foreign firm has some prior belief regarding the ex post discretionary policies of the local government. Since the investment is completely irreversible, such a belief pattern might not induce the firm to invest in a country which badly needs it. It is shown that the host government can design a subsidy scheme which might attract foreign investment by removing the credibility problem.

1. Introduction

Foreign technology and investment are badly needed in many countries. Developing economies, particularly those in transition, would gain a lot from stepped up investments. Since investments are largely sunk today but returns arrive in the future, foreign investors often worry about the host government’s discretionary policies. The theoretical literature usually focuses on two aspects of such a “hostage” problem. If the investment is utterly irreversible, the host country government might increase the prenegotiated tax rate, in effect reaping all the surplus from the project. The government could also expropriate the foreign assets. These threats, of expropriation and discretionary tax policies, are likely to have adverse effects on direct foreign investment. Jaspersen et al. (1995) demonstrate a negative relationship between country risk and gross foreign investment as a percentage of GNP. Zebregs (1998) has discussed issues related to policy uncertainty and foreign direct investment.

Ignoring reputational considerations, the only subgame-perfect equilibrium of such a game is where the multinational firm does not invest at all. Eaton and Gersovitz (1984), Doyle and Wijnbergen (1984), and Cole and English (1991) have sought solutions to the problem when multinationals are capable of inflicting some costs on the host government once expropriation takes place. Marjit (1990) has tried to show how investment-sharing in the presence of a precommitted tax rule can eliminate the credibility problem. More recently, papers by Marjit et al. (1995), Broll and Wahl (1998), and Marjit and Mukherjee (1998) have discussed related issues in the context of missing risk-sharing markets and technology collaboration in international joint ventures.

As the pace of economic reform picks up in several countries (such as in the socialist bloc, and in Africa and India), governments in these countries experience difficulties in attracting foreign investors. Despite several reforms adopted recently, India, for

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example, still awaits an influx of direct foreign investment on a large enough scale. Unfortunately a long history of administrative controls, rampant government inter-
vention and antagonism towards foreign investment can lead to the deferral of invest-
ment plans. If reputational costs are not significant, the local government will find it all too easy to cheat the investor once the investment is sunk.

In this paper we address the issue of credibility when the local government is honest and decides to stick to an announced tax rate, but the foreign investor does not believe this and has a prior belief about the possible deviation of the government from the announced policies.

The assumed honesty of the local government is an exogenous element of the model, and the existence of an honest agent in such a game is justified by the fact that honesty as an element can enter the preference structure of such an agent. Even if the local government is honest, for some belief patterns of the foreign firm, the credibility problem will continue to be severe enough to deter the entry of foreign investors. The purpose of this paper is to show that, by subsidizing the investment at the beginning of the project and later recovering the subsidy through a tax, the local government can attract the investment under some conditions. This scheme does not have to alter the existing belief pattern.

We start from a situation where the problem of credibility is reduced to some extent by (a) the presumed honesty of the government, ruling out an equilibrium where the government always reneges on the contract, and (b) introducing some prior belief on the part of the foreign investor about the government’s honesty. Thus the paper focuses on a situation where the local government never engages in opportunistic behavior, because of high reputational costs, but foreign investors do not totally believe the government.

Section 2 introduces the model and the basic result, and then section 3 extends the analysis. Section 4 shows that the range over which investment–subsidy scheme works decreases (somewhat counterintuitively) with the foreign investor’s confidence in the honesty of the local government. Section 5 presents some final remarks.

2. The Model and the Basic Result

Consider a situation where an international firm can invest $I$ (fixed) initially and earn a discounted sum of returns $R_w$ (fixed) in the rest of the world. If the certain tax rate in the rest of the world is $t_w$, then the firm’s return in the outside world is $(1 - t_w)R_w - I$. In the country concerned the local government announces a tax rate $t_A$ while writing an agreement with the foreign firm. But the foreign investor believes that the govern-
ment will stick to such a decision with probability $p$, or grab the entire surplus ex post. Therefore, for each $t_A$, the expected tax rate $t_E$ is

$$t_E = pt_A + (1 - p),$$

where $p$ is known to the government as well. The risk-neutral investor will refrain from investing if the following inequality holds:

$$(1 - t_E)R - I < (1 - t_w)R_w - I,$$  \hspace{1cm} (2)

or

$$(1 - t_E)R < (1 - t_w)R_w,$$  \hspace{1cm} (3)

where $R$ is the return in the country in question for the same investment $I$. Substituting (1) into (2), we may express the condition for non-investment as

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\[ t_A > 1 - \frac{(1-t_w)R_w/R}{p}. \] (4)

Condition (4) leads us to the following proposition.

**Proposition 1.** If \((1 - t_w)R_w/R > p\), then there is no \(t_A \geq 0\) at which foreign investment takes place.

We will assume \((1 - t_w)R_w/R > p\) throughout the paper to make our incentive problem relevant. Thus at no nonnegative \(t_A\) will foreign investment be forthcoming.

Given this setup, the belief structure, and the tax rate \(t_w\), we introduce a scheme of investment-sharing by the host country government. Let the government put up \(\theta l\) (with \(0 < \theta < 1\)) amount of investment subsidy up-front and try to recoup it by future tax earnings, provided such action attracts foreign investment. Even if the initial subsidy \(\theta l\) has to be fully matched in present-value terms by the future tax earnings, we show that foreign investment may be forthcoming. In other words, the following constraints are to be satisfied under such a scheme:

\[(1 - t_e)R - I + \theta l \geq (1-t_w)R_w - I, \]

\[ t_A R \geq \theta l. \] (5) (6)

This leads us to the following proposition.

**Proposition 2.** There exist \(0 < t_A, \theta < 1\), satisfying (5) and (6) provided that

\[ p > \frac{(1-t_w)R_w - I}{R - I}. \]

**Proof.** Let \(t_A R = \theta l\). Substituting into (5) we get

\[(1 - t_e)R + t_A R \geq (1-t_w)R_w\]

if and only if \(t_A \geq [(1 - t_w)(R_w/R) - p]/(1-p)\). As we are looking for one possible pair of \(t_A\) and \(\theta\), let us concentrate on the equality relationship. Since \((1 - t_w)R_w/R > p\), we obtain

\[0 < t_A = [(1 - t_w)(R_w/R) - p]/(1 - p) < 1.\]

Now

\[ \theta = \frac{t_A R}{I} = \frac{(1-t_w)(R_w/R) - p}{1-p} \frac{R}{T}, \]

where \(\theta < 1\) if and only if \(p > [(1 - t_w)R_w - I]/(R - I)\). This is less than one if \(R > (1-t_w)R_w\), which is possible.

The intuition behind the result is as follows. We know that \(t_A < 1 - [(1 - t_w)R_w/R]/p\) for investment to materialize. As we have assumed \((1 - t_w)R_w > pR\), there is no \(t_A \geq 0\) for which the above condition holds. Let us change the scenario a bit and assume that a proportional revenue subsidy \(s\) is given to the investor. In that case (4) is altered to

\[ t_A < 1 + s/p + (1-t_w)(R_w/R)/p. \]
Note that even if \( [1 - (1 - t_w)(R_w/R)/p] < 0 \), \( t_A \) can still be positive and less then \( s/p \). In particular if \( s = t_A \), it always holds as \( 0 < p < 1 \). Hence such a subsidy makes investment possible. Note also that since we are considering partial subsidy, \( \theta < 1 \), and we need a lower bound on \( p \).

The condition \( R > R_w(1 - t_w) \) is quite likely to be satisfied. If a multinational contemplates investing in a low-wage developing economy, it is reasonable to assume that \( R > R_w \), and hence \( R > R_w(1 - t_w) \). In other words, if \( R < R_w(1 - t_w) \) or \( R < R_w \), it is difficult to understand why an investor would be at all interested in investing in the country concerned. Propositions 1 and 2 suggest that if the following condition holds

\[(A) \quad (1 - t_w)R_w/R > p > [(1 - t_w)R_w - I]/(R - I),\]

a tax scheme will not attract foreign investment but a tax–subsidy scheme would. Since \((1 - t_w)R_w/R\) may be written as \([(1 - t_w)R_w - (1 - t_w)IR_w/R]/(R - I)\), it can be seen that condition (A) can be satisfied if \((1 - t_w)R_w < R\).

To get an impression of the critical value of \( p \), we can choose some numerical values. Let such values of \( p \) be denoted by \( \bar{p} = (1 - t_w)R_w/R \) and \( p = [(1 - t_w)R_w - I]/(R - I) \). If \( t_w = 20\% \), \( R_w = 2I \), and \( R = 3I \), then \( \bar{p} = 8/15 \) and \( p = 3/10 \).

The range \( \bar{p} - p \) equals

\[(1 - t_w)R_w/R - [(1 - t_w)R_w - I]/(R - I) = \frac{1 - (1 - t_w)R_w/R}{(R - I)I},\]

which increases with \( t_w \), decreases with \( R_w \), but is ambiguous with respect to \( R \).

3. Extension: Subsidies with Opportunity Costs

Our assumption that the government can put up a foreign investment subsidy neglects the opportunity cost of doing so. This is particularly relevant for countries facing severe resource constraints. Such costs can be incorporated into our simple framework of the previous section.

Let us assume that, for each dollar raised as a subsidy, the host government sacrifices net income from an alternative activity. Therefore, the incentive constraint for the government changes from (6) to (7):

\[ t_A R \geq \alpha \theta \quad \text{with} \quad \alpha > 1. \quad (7) \]

The incentive constraint for the international firm, (5), is unchanged. It can be shown that the set of probabilities for which the investment–subsidy scheme works will shrink relative to a situation where \( \alpha = 1 \). One can work with the constraints (5) and (7) as in Proposition 2.

For the scheme to work in such an environment one has to introduce an upper bound for \( \alpha \). It is easy to see that, for a low enough \( \alpha \), one can derive a set of probabilities for which the scheme will work. We state the following proposition.

**Proposition 3.** There exists \( 0 < t_A < 1 \) satisfying (5) and (7) provided that

\[ p > \frac{R_w(1 - t_w) - I}{R - \alpha I}. \quad (8) \]

**Proof.** Substitute \( t_A R/\alpha \) from (7) with equality into (5), to derive
Similar to the proof of Proposition 2, we obtain

\[
\theta = \frac{R}{\alpha I} \left\{ \frac{(1-t_w)R_w/R - p}{1/\alpha - p} \right\},
\]

where \( \theta < 1 \) if and only if \( p > \frac{(1-t_w)R - I}{R - \alpha I} \). This proves the claim.

The upper bound on \( p \) continues to be the same, which is \( (1-t_w)R_w/R \). The new lower bound is \( R_w(1-t_w)/(R - \alpha I) \). Note also that the range

\[
\bar{p} - p = \frac{1 - \alpha(1-t_w)R_w/R}{R/I - \alpha}
\]

increases with \( t_w \), decreases with \( R_w \) and \( \alpha \), but is ambiguous with respect to \( R \). To see the effect with respect to the opportunity cost, note that

\[
\frac{\partial (\bar{p} - p)}{\partial \alpha} = \frac{1 - (1-t_w)R_w/I}{(R/I - \alpha)^2} < 0 \quad \text{since} \quad (1-t_w)R_w > I.
\]

Note that for the scheme to work, \( R > \alpha R_w(1 - t_w) \), which is a stronger condition than in the previous case as \( \alpha > 1 \). The upper bound on \( \alpha \) would be given by \( R/R_w(1 - t_w) \).

4. Range of Applicability

In this section we show that, somewhat counterintuitively, the range (of world returns \( (1-t_w)R_w \) or domestic returns \( R \), given the other) in which our scheme works decreases with \( p \); and more intuitively it also decreases with \( \alpha \).

As foreign investment will be forthcoming without our scheme if \( pR > (1-t_w) \), the upper bound for \( R \) is given by

\[
\bar{R} = (1-t_w)R_w/p.
\]

The lower bound at \( \theta = 1 \) is obtained from (8) as

\[
\underline{R} = \{(1-t_w)R_w - \alpha d(1/\alpha - p)\}/p.
\]

The range of \( R \) in which our scheme works is

\[
\bar{R} - \underline{R} = \alpha d(1/\alpha - p)/p = I(1/p - \alpha),
\]

which decreases with \( p \) and \( \alpha \). Similarly, the lower bound of the (net-of-tax) world returns is given by

\[
\frac{(1-t_w)R_w}{p} = pR
\]

and the upper bound by

\[
(1-t_w)R_w = \alpha d(1/\alpha - p) + pR.
\]

Hence, the range of world returns over which our scheme works is \( I(1 - \alpha p) \), which also decreases with \( p \) and \( \alpha \). To summarize, we have the following proposition which follows from the above discussion.
Proposition 4. The ranges of world returns and domestic returns (given the other) over which the proposed investment–subsidy scheme works decreases with \( p \) and \( \alpha \).

It is rather counterintuitive that the range of applicability of our scheme decreases with \( p \). However, this can be explained by looking at the changes in the expected tax rate faced by the investor when the government decides to put up an extra dollar of subsidy. Since the maximum tax that the government can extract is always 100\%, the expected tax rate increases by \( p \) for every increase in the announced tax rate (see equation (1)). Therefore, if the host government wants to pay a dollar now and recoup it later by a tax, the expected tax burden increases by a fraction \( p \), leaving \((1 - p)\) as the net surplus, which of course decreases with \( p \).

5. Concluding Remarks

The purpose of this paper has been to analyze the situation of an honest government which cannot convince a foreign investor about the credibility of an announced tax policy. We argue that, even if the government decides to follow the announced tax rule and the investor assigns some positive probability that the host country government will do this, investment might not be forthcoming. In such circumstances an up-front investment–subsidy might work provided the probability \( p \) is not too low. We characterize such a lower bound on \( p \) in terms of the tax rate in the rest of the world and the return on investment. If the return on investment is very high, the lower bound on \( p \) goes down considerably. If \( p \) is high enough, one does not need a subsidy scheme.

That \( p \) is known to the government is a crucial assumption of the paper. Given that the government knows the value of \( p \), it becomes easier to design such a sharing mechanism. But even if this probability is not known, the case for trying out a tax–subsidy scheme still makes sense. If the foreign investor rejects a tax proposal, the host government can offer a tax–subsidy proposal. Also, it is clear that one could formalize the problem in terms of a lump-sum subsidy instead of an investment sharing mechanism.

References
