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Credibility of economic reform and foreign direct investment in the former Soviet Union region

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Credibility of economic reform and foreign direct investment
in the former Soviet Union region

by

Yuri Y. Yermakov

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Major: Economics

Major Professors: Harvey E. Lapan and Stanley R. Johnson

Iowa State University

Ames, Iowa

1997

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DEDICATION

This dissertation is dedicated to the memory of my grandfather, Alexander M. Razakov.

May he rest in peace.

To my mother.

And

To the most important people in my life: my son Sasha, my wife Olga, and
my grandmother Sonja.

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ABSTRACT

Economic transition from socialist to market-based economy has been the subject of intense economic research in the last two decades. However, there are very few publications that address the transitional issues from the traditional microeconomics theory perspective. This dissertation focuses on several transitional issues. The first topic is: what is the economic nature and major characteristics of economic reform? Secondly, the dissertation focuses on the relationship between the government and private sector in the reform environment. In the end, the focus of the dissertation shifts to the question of economic reform credibility and of finding the most efficient ways to support the economic reform objectives.

To find the answers to the above questions this dissertation develops two models of economic reform: a pre-commitment model and a time consistent model to show that besides the traditional reasons that effect the speed and intensity of economic reform, the sequence and timing of decisions is critical to the outcomes of the reform. We show that because private agents correctly anticipate that the government has the ability to change its previously announced policy, private sector support of the government's reform efforts may be much weaker relative to what it could be if the pre-commitment mechanism existed. We also show that the absence of the pre-commitment mechanism not only effect the speed and intensity of economic reform in the future but also may effect the level of

reform activity in the initial stages of economic reform. For example, we show that if there is no pre-commitment mechanism it is possible that the government could be interested in increasing the level of reform efforts during the initial stages of reform. This can increase the probability of political reversal which is of a great concern of all private investors.

We show that a pre-commitment solution is more desirable comparing to the time consistent solution and that a pre-commitment mechanism is required to enhance the credibility of the pre-commitment solution. And we propose such a mechanism that together with other pre-commitment mechanism can be applied in transition economies, especially in the initial stages of the reform.

1. INTRODUCTION

1.1. Overview

More than 30 countries that were in the Soviet orbit are currently in the process of economic transition from a centrally planned to a market-based system.¹ The transition can be said to have begun in 1989, with Poland inaugurating its "big bang" stabilization and reform program on January 1, 1990. Since that time economists, political scientists and sociologists have been carefully studying the process of economic reform.

This dissertation focuses on several transitional issues. The first topic is: what is the economic nature and major characteristics of economic reform? Secondly, the dissertation focuses on the relationship between the government and foreign firms in the reform environment. Thirdly, in this paper we try to answer the question of why it can be of interest to the government to start, postpone or delay the reform. In the end the focus of the dissertation shifts to the question of finding the most efficient ways for the international financial and development institutions to support the economic reform objectives.

1.2. Literature Review

1.2.1. General Comments on the Literature

Since the first attempts of economic reform in Yugoslavia in the 50s, in Hungary in the 60s and in China in the 80s, economists have studied the process of economic

¹ A complete list of countries in such a transition would also include Cuba, Vietnam, China and even certain African countries like Angola, Ethiopia and Mozambique. The focus of this paper, however, will be on the nations of eastern Europe and those that were effectively part of the former Soviet Union.

reform. However, there are very few comprehensive studies that give us satisfactory definitions and research methodology to study and evaluate the transition process. It appears that every author starts from scratch every time she/he touches the issue of economic reform. The economic literature that covers the issues of economic reform can be divided into three distinct blocks of papers. The first set is represented by purely academic papers that apply available economic theories to explain the nature of the political and economic events in the transition economies. These papers have a tendency to be extremely general and, for the sake of being in line with theory, tend to lose touch with reality. The second set of publications is represented by the economists from the former Soviet Block. Opposite to the first group of transition papers, this literature is dominated by so called "recent experience" papers that add very little to the understanding of the transition process. The third set of studies is represented by those analysis performed by economists who are working or have worked for the major international development and financial institutions. These papers usually provide a good blend of economic theory, knowledge of political and economic events in a variety of transition economies, coupled with a solid statistical support. While this group is the most valuable source of theoretical and empirical information about the transition process, this literature remains very thin.

In the literature review that follows I will concentrate on the progress in the following aspects of the economic reform literature: nature of economic reform;

government and economic reform; foreign direct investments and economic reform: and role of international financial and development institutions and economic reform.

1.2.2. Nature of Economic Reform in Transition Economies

The evolution of some economists' views on the nature of economic reform in the former socialist countries came a long way from initially a very simplified, idealistic "laissez-faire" approach to a more sophisticated view of economic reform as the process of economic transformation of a centrally planned economy into a market-based system. From the beginning of the economic reforms in East European countries, it has been clear what is the final destination of transition. The economic profession was relatively fast in answering the question of what had to be done by the countries. "Mainstream analyses of the transition process generally emphasized the need for action in six areas: macroeconomic stabilization; price liberalization; trade liberalization and current account convertibility; enterprise restructuring (especially privatization); the creation of a social safety net; and the development of the institutional and legal framework for market economy (including the creation of a market-based financial system)" (Fischer, Sahay, Vegh, 1996, p.46). The next logical step of the mainstream analyses could probably be an agreement on how the actions in the above areas should be arranged together, either a design of some sort of generic reform technology. However, " ... major controversies arose over the speed and sequencing of the reform and the strategy to be followed in each area" (Fischer, Sahay, and Vegh, 1996, p.46). What is more frustrating is that these controversies were at a very fundamental level of the research related to economic

reform. Of course, each country's economic reform has its own specific characteristics and is unique in some sense. However, the economic profession failed even to define and agree on the question of what are the lower and upper technological and economic boundaries of the reform process. Only within the limits of feasible reform technology and associated political and economic costs can we compare different speeds, sequencing, and quantity of reform efforts used. It is not enough to say that one reform technology or one combination of reform inputs is better than another, unless it is technologically feasible and unless the notion of reform cost is used. The debate over the speed of reform and many other heated debates about the intensity of economic reform efforts and their complementarity and substitutability become very poorly defined if we don't use the notion of the cost of different reform efforts. Why don't we debate the question, what is better to build a house in one month or in one year, given that the cost of construction is the same? I hope that the answer is obvious. If so, why should we debate the question of what is better: to do a reform in one or five year? Obviously, in one year is better. Some may argue that there are areas of reform that "inherently take time". Nobody will argue with that; however, this is not an economic question but a question of available reform technology. And again the similarity with a production technology is stunning. What is the point to argue that building a house in one year is better than in one month, if there is no technology that allows one to build it in one month? Applying the same logic to the economic reform we ask ourselves the question: what is the point to argue that it is better to privatize the state-owned enterprises gradually or in a "big bang" fashion, if there is

no other but gradual type of technology available? However, it is not only the question of technologically feasible time of a particular reform effort but also the question of technologically feasible sequences of the reform. And again the similarity between the building of a house and economic reform is striking. Why don't we criticize construction workers for being slow in building a roof when there are no walls in a house? The answer again is very simple: just because it is technologically not feasible (or it maybe feasible but too costly). The same is true for some reform efforts: it is just not technologically possible to put any (productive) effort into development of capital markets unless there is at least a marginal progress made in price, trade liberalization and enterprise restructuring. In other words, a discussion about which economic reform practice is better becomes meaningful only if it is, first, technologically feasible and, second, related to the costs of different reform sequences and their speeds.

1.2.3. Economic Growth and Economic Reform

It is believed that the major benefit of transitional reforms is improvement of the performance of the economy and in the overall level of economic development. However, this statement is not necessarily true for all periods of transition. As it has been correctly pointed out by Pinera, "The results of many worthwhile reforms lie on a J-curve.... they tend to make things a good deal worse before they get better" (in Williamson 1994, p. 227). We can attribute this to the fact that new capital needs time to respond to the new incentives and offset the negative tendencies in so called "system specific" sectors of the economy, which collapse almost instantly as soon as the economic reform begins.

1.2.4. Government, Political Cycle, and Economic Reform

1.2.4.1. Types of Government

The first attempts to introduce the government to the models of economic reforms were based on the twin premises that; (i) a government's objective would be to achieve an economically efficient outcome; and (ii) there would be no information cost, administrative difficulties, or other barriers to identifying and implementing policy toward those ends. The underlying premise is that governments and civil servants in some sense were "above the system". It/they would selflessly and costlessly seek the welfare of the people, even when the people themselves did not know what was in their self-interest, and would unerringly and effortlessly know how to achieve their best interest (Krueger, 1993). The view of the government as a benevolent social guardian has been the most popular and mainstream in the economic literature for decades and dominated the literature related to economic reform. However, after several failures to perform its guardian duties in a transition environment the role of the government and its objectives came under scrutiny from a variety of perspectives and for a number of reasons. The first logical criticism was that the government has to have its own self-interest, which we and many others believe is to remain in power and attempt to formulate policies and strategies that are in line with this objective (Campos and Esfahani, 1996). Second, it is hard to believe that the government is independent from the influence of a variety of interest groups, including those that opposed the government's *ex ante* economic platform (Becker, 1983). Third, it has been widely noted that in collective decision making, there

can be a substantial free-rider problem (Olson, 1965). And fourth, the government consists of people who are given some distributional power. This is especially true for transition economies. This power provides incentives for people to profit from receiving property rights at some cost.

As experience mounted in developing countries, it became increasingly evident that governmental behavior is far more complex than that in the benevolent social guardian model of the state. Lal and Myint (1990) have suggested a classification of such models. It includes models in which the state is "autonomous", pursuing objectives of its own, and models in which the state is "factional", reflecting collective decision making subject to a variety of constraints. There are several posited types of autonomous and factional states. Autonomous states are all characterized by a relative freedom from overriding influences of particular economic or political interest groups. The ruler or rulers enjoy a considerable degree of freedom from direct pressure, at least in the short run. Rulers are constrained, however, in several ways. First, there is an economic constraint. Second, even rulers of autonomous states must maintain power, which may constrain the choice of his/her actions. Lal and Myint subdivide autonomous states into the guardian state and predatory states.

Factional states, by contrast, are characterized by coalitions of some interest groups and are far more constrained in their actions than autonomous or benevolent guardian states. The governing coalition seeks to maximize the well being of the members of the coalition, subject to attempting to stay in power. The factional state can be

democratic or authoritarian. When it is democratic, a coalition of interests must maintain power, and resources are allocated to buying support of different members of the coalition. The factional democratic state may be quite weak and self-destructive, especially when coalitions collapse or there is a disagreement because of conflicting distributional issues.

In addition to the above pure types, there are plenty of examples where the state is a combination of the two types. A strong case of autonomous-factional state can be post-communist Russia and some other countries of the former Soviet Union. In Russia, for example, the president has to rely on the coalition of different political and economic interest groups in order to be elected through direct presidential elections process. However, after the elections are won, the constitution gives the president a considerable autonomy and freedom from overriding influences of particular economic and political groups, even those that helped him/her to win the elections.

One of the advantages of factional-autonomous states is that the government does not need to make winning coalitions every time it make a reform effort. Thus, the government is concerned only about the effects of the reform efforts on its election chances. It is quite obvious that because factional and factional-autonomous states actions are constrained by political considerations, only by chance they will coincide with that of benevolent guardian type of government actions and for that reason is a second-best solution.

1.2.4.2. Political Cycle and Economic Reform

What is the effect that the timing of elections has on the government behavior with respect to economic reform? Obviously, if the government is to be modeled as a benevolent dictatorship, this question becomes irrelevant. For all other types of governments, the desire to stay in power is probably their dominant political objective. Retaining power requires establishing sufficient political support from the polity by the time of next elections. Early models of political cycle argued that the majority of voters are myopic, i.e. can not distinguish between "bad" and "good" policies, and react only to the current state of events. Thus, the government has a rational incentive to manipulate economic policy to maximize their electoral chances as elections approached. On the other hand, the defenders of "rational expectations" hypothesis argued that voters are too smart to be tricked by the government, therefore reducing the incentive to manipulate policy to political ends. However, in my opinion, the truth is somewhere in between: some of the voters are myopic (or myopic with respect to some government actions), some of them are forward looking (or forward looking with respect to some government actions and myopic with respect to others). Also, it is hard to ignore the fact that even for a forward-looking voter the current state of the economy is important in assessing of the government performance in the past and in the future. Therefore, answering the question of how the economic reform fits the government objective to stay in power, the following two major groups of factors have to be considered: the structure of the polity (percentage

of myopic and forward-looking sentiments) and the structure of the political cycle vs. the structure of the reform efforts cycle.

1.2.5. Distributional Conflicts and Economic Reform

Distributional conflicts and heterogeneous groups interests within the context of economic reform recently became a very popular line of explanation of some economic reform phenomena (sometimes irrational from the point of view of a social planner) in transition economies. For example, Alesina and Drazen (1991) argue that, often, the process leading to a monetary and fiscal stabilization can be described as a war of attrition between two groups with conflicting distributional interests. They considered an economy where, for whatever reason, a budget deficit appeared. A stabilization is defined as an increase in regular taxes that eliminates the deficit. Before a stabilization occurs, government spending and interest on the external debt are paid by the government, partly by borrowing abroad and partly by means of a highly distortionary tax. In such a situation, a benevolent dictator would not delay the stabilization program. In fact, delays are socially costly for two reasons: first, until the stabilization occurs, distortionary taxation is used; second, the longer one waits, the more debt is accumulated, and the higher the interest the government pays. However, a conflict between interest groups over how the burden of the stabilization will be distributed leads to rational delays. This result is possible if it is assumed that the loser in a conflict will have to pay more than the winner and if the information on the cost of waiting is private information. Under the above conditions, stabilization does not occur immediately because each group has a

rational incentive to wait, hoping that the opponent will concede first (Alesina and Drazen, 1991).

The above situation is typical for factional democratic settings of the government. However, it appears that these conflicts are typical for factional-autonomous states in some areas of reform. For example, in Russia the president and his reform oriented government had enough power to launch price liberalization and foreign trade reform and did not need to seek coalitions in the Parliament to do so. This was typical for all actions that did not require anything more than government action (the government just stops regulating prices, reduces import and export tariffs, etc.). On the other hand, in the areas of economic reform, which besides government actions require actions of other interest groups and have direct distributional implications, such as privatization and enterprise restructuring, the government may be locked in a war of attrition, unless privatization and enterprise restructuring procedures provide enough incentives for major interest groups to implement it immediately.

To stay in the power in the post-communist environment means that by the time of the next elections the government has to attract sufficient political support from major polity groups. However, during the time between the two elections the government is not required to make winning coalitions with other interest groups unless these groups are required to move.

The most typical division of the political spectrum has been offered by Olson (1965). Adapting it to the political environment in the transition economies we can easily

recognize four interest groups: the more influential pro-socialism groups, the less influential pro-socialism groups, the more influential pro-capitalism groups, and the less influential pro-capitalism groups. We assume that the less influential interest groups are passive observers of the government actions and cannot block or prevent the government from taking actions. The less influential pro-socialism interest groups will be satisfied if by the time of new elections the government will manage to maintain a pre-reform level of GNP. The less influential pro-capitalism interest groups will be supportive of the government if it, first, puts a certain effort into economic reform and, second, if by the time of new elections it will manage to maintain at least a pre-reform level of GNP.

On the other hand, the more influential interest groups can effectively block the other interest groups' actions unless their group interests are not satisfied. We assume that in the beginning of transition the more influential pro-capitalism interest groups represent the government and have power to take actions. The more influential pro-socialism interest groups do not have power to act but can prevent the government from making moves that are not in line with their group interests.² The relationship between the reform-oriented government and the influential opposition is a very interesting and critical issue of transition. Unfortunately the scope of this dissertation does not allow to discuss it in details.³ We simply assume that these groups will not attempt to block government actions if during the process of privatization and enterprise restructuring the government

² We assume that all influential liberal are in the government and their objective it to stay in power.

³ An interesting treatment of the issue is provided by Rodrik (1994), Drazen and Grilli (1993), Bradburd (1993) and Waterbury (1993).

allows them to receive a mutually-agreed share of state property (Campos and Esfahani, 1994). In my opinion, politically motivated privatization will not only neutralize the political opposition but will also reduce the time needed for restructuring and in general improve the efficiency of the government's reform efforts. However, this intuition has to be supported by more careful analysis, which is beyond the scope of this dissertation.

1.2.6. Foreign Direct Investment and Economic Reform

The relationship between the foreign direct investments and developing countries has been extensively studied by political scientists and economists during the last four decades. It has been realized that foreign investments suffer from economic as well as political instability. Thus, the major focus of the economists at that time was on measuring of socio-political instability in the developing world by construction of some sort of "index of instability" which summarizes various phenomena of social unrest and helps multinational corporations to survive the blast of national, anti-colonial, and anti-imperialistic movements around the world and protect their investment in these countries. These indices have also been extensively used by the developed countries' intelligence services to estimate the probability of a variety of political events in different parts of the world to happen. An important reference on this point is Hibbs (1973), who uses the method of principle components to construct an index. More recently, Venieris and Gupta (1986), Venieris and Sperling (1989), Gupta (1990), Benhabib and Spiegel (1992) and Mauro (1993) have used several indices of socio-political instability as explanatory

variables in various regressions in which one of the dependent variables is foreign direct investments.⁴

Another set of economic studies, which is known under the common name of "a theory of expropriation" given to it by Eaton and Gersovitz (1984), focused on the following questions: why can it be of interest for a developing country's government to intervene and expropriate the property of a multi-national corporation? How does a threat of government intervention effect the behavior of foreign investors? What are the welfare implications of a potential threat of government intervention? Eaton and Gersovitz (1984) developed a neoclassical type model of expropriation derived explicitly from utility-maximizing behavior on the part of host country and investors. They assumed that that capital is available only through foreign investments, and it depreciated completely in a single period. As a result, expropriation means that the country will have no capital in all future periods. The model helped them to conclude that: (i) the threat of expropriation can significantly distort the international allocation of capital even if the act of expropriation is relatively rare; (ii) the ability of a country's government to expropriate foreign investment may actually reduce its welfare; and (iii) a host country may be better off if the investors' governments can retaliate against an expropriating country.

Cole and English (1991) developed a stochastic model of foreign direct investments under the threat of expropriation. They found that expropriation can occur in

⁴ Alesina and Perotti (1996) showed that joint endogeneity of socio-political instability and FDIs is crucial in determining the relationship between these two variables. They successfully showed that there are good reasons to believe that some variables (such as inflation, growth and investments) that one is attempting to explain as a function of socio-political instability are themselves determinants of social unrest.

either good or bad states of nature, depending on the degree of a country's risk aversion. Second, similar to Eaton and Gersovitz they found that increases in the level of FDIs can decrease the probability of expropriation. Raff (1992) offered his model of expropriation with asymmetric information about production and marketing know-how.

There are several things that are not very appealing in all of the models described above. First, it is not very realistic that the government will be willing to expropriate the foreign property just because of a productivity shock (Cole and English, 1991), or because of an unexpected change in the labor or capital endowments (Eaton and Gersovitz, 1984), or because the government found out that domestic managers can manage the capital invested in the country by foreign firms. In my opinion, political motivation, rather than economic motivation, has to be the major reason for such an extreme government action. In all other cases, the government has too many traditional tools to reach the same goals and without jeopardizing its international political and economic credibility, thus avoiding the imposition of economic and political sanctions.

The collapse of the socialist system in eastern Europe and the dissolution of the Soviet Union, followed by increasing demand for foreign direct investments in this region, generated additional attention to this subject. However, the motivation behind the literature in the 90s was different from that in the 70s. Its major concern was to find the answer to the following questions: How do the FDIs effect the progress of economic reform? How does the progress of economic reform effect the level of foreign direct investment in the country? Intuitively, it is clear that a resurgence in private investments

is a necessary ingredient of a sustainable recovery from the initial reform-related shock in transition economies. However, economic reform involves a serious dilemma. On one hand, the situation calls for immediate expansion into these new markets. On the other hand, rational behavior calls for withholding investments until much of the residual uncertainty regarding the success of the reform is eliminated. The first attempt to relate the above intuition to the mainstream hypotheses of microeconomics has been made by Rodrik (1991). He developed a model in which uncertainty about the lasting power of reforms can act as a tax on investments, even when entrepreneurs are risk neutral. The model yields a simple linear formula that relates the size of the implicit tax to the probability that the reforms will collapse and to the magnitude of the irreversibilities in the investment process. The model is also useful in showing how even a small subjective probability of reform collapse may render harmful an otherwise sensible reform. Even though in this paper Rodrik treats the probability of policy reversal as exogenous to the firms' behavior, he correctly points out that the magnitude of the ex-ante probability of reversal has to be endogenously determined by how successful the reform is in altering private sector behavior. He writes that "the greater the investment response (to the reform), the more likely that entrenched interests will be created in favor of the continuation of the reform".

1.1.7. Transition Economies and International Financial Institutions (IFIs)

There are several questions, related to IFIs that are of interest to the economic profession. First, how does the potential availability of foreign aid and lending facilities

effect the progress of economic reforms in transition economies? Second, assuming that foreign aid is beneficial to the success of economic reform, when, to who and how much do the IFIs have to lend in order to reach the maximum efficiency in the economic reform progress? Do transition economies need help from IFIs and how does the very existence of IFIs effect the progress of economic reforms in transition economies?

If economic reform has costs, as so many believe, then foreign aid should help reforms to get launched and sustain by alleviating these costs. This is a standard justification for IFIs "structural adjustment lending" as well as for official bilateral credit. However, the logic of this statement is not unassailable, even if the premise is accepted. The reason is that external resources reduce the costs both of reform and of doing nothing (i.e., of avoiding reform) (Rodrik, 1996). In addition, the potential for receiving financial aid can actually exacerbate the delay in reforms, by inducing groups to postpone making sacrifices until aid actually materializes. Addressing this issue, Sachs is explicit that a government committed to reform is needed before aid or other financial support can do any good. He writes that aid is needed "to help good government to survive long enough to solve problems" (in Williamson, 1994, p. 512). However, if the government's choice of reform effort is endogenous, donors must ensure the recipient governments will undertake the reform before doling out the cash, i.e. that "aid must come with a heavy dose of conditionality" continues Sachs. There is a relatively large literature on conditionality and its effectiveness (see, for example, Guitian 1992; Mosley 1987; Polak 1991; and Thomas et al. 1991).

If the government is committed to economic reform, why should IFIs provide aid and credit facilities to transition countries? Some authors correctly argue that before the final goals of economic reforms are reached, there is a strong possibility that a transition economy will be trapped in a crisis so deep that anti-reform interest groups will force the reform-oriented government to resign (Sachs, 1991). In some cases, the expected disutility associated with the risk of political reversal can be so large that it will be optimal for the reform-oriented government to put all reforms on hold, unless a sufficient stabilization package is offered by IFIs. The size of this package, of course, will depend on how wise was the reform technology chosen, on the inherited economic structure of the economy, on the level of public endurance to withstand the hardships of economic reform, and on the strength of political opposition to the reform. However, if the government is not fully committed to economic reform, but considers reform as one of its alternative strategies to reach its own objective, the effectiveness of aid becomes questionable.

2. ECONOMIC REFORM, REFORM POLICY CREDIBILITY AND FOREIGN DIRECT INVESTMENT UNDER TWO MODELS: THE PRE-COMMITMENT MODEL AND THE TIME CONSISTENT MODEL WITH AND WITHOUT RISK OF POLITICAL REVERSAL

2.1. Overview

In this chapter of the dissertation we develop a two-game model of economic reform: the pre-commitment model and the time consistent model to show that besides the traditional reasons that affect the speed and intensity of economic reform efforts of the government, the sequence and timing of decisions is critical to the outcomes of the reform. We show that because private agents correctly anticipate that the government has the ability to change its previously announced policy, private sector support of the government's reform efforts is much weaker comparing to the case when the government can pre-commit to the announced level of the reform efforts in the future. On the other hand, because the government knows that firms know that there is no credible pre-commitment mechanism available to support the announced level of future reform efforts, its actual level of reform efforts decreases relative to what it could be if the pre-commitment mechanism existed. We also show that the absence of the pre-commitment mechanism not only effect the speed and intensity of economic reform in the future but also effects the level of reform activity in the initial stages of economic reform. For example, we show that if there is no pre-commitment mechanism it is possible that the government could be interested in increasing

the level of reform efforts during the initial stages of reform. This not only can increase the overall cost of reform effort but also increase the probability of the political reversal which is of a great concern to all private investors. We show that a pre-commitment solution is more desirable comparing to the time consistent solution and that a pre-commitment mechanism is required to enhance the credibility of the pre-commitment solution. And we propose such a mechanism that together with other pre-commitment mechanism can be applied in transition economies, especially in the initial stages of the reform.

2.2. The Economy

2.2.1. Production Technology and Economic Reform

Consider one of the former Soviet Block countries that is undergoing a transition from a centrally planned system to a market-based system of economy. The economy is endowed with capital K^R which is of inferior quality compared to the international standards and can be used only in domestically available production technology F^R operated in a centrally planned environment. In other words we assume that K^R is "economic system specific". On the other hand "internationally standard" capital K can be used only in internationally standard technology F and for a variety of reasons (ideological, political, and economical) is not present in the country at the time when the economic reform begins. We assume that labor resources are homogeneous and can be used in both traditional and internationally standard production processes. We also assume that labor supply is absolutely elastic, i.e. an army of unemployed willing-to-work labor is present in the country readily available for employment as soon as the new private capital comes to

the country.⁵ We define the labor used in the traditional sectors as L^R and the new sectors of the economy as L .

Now we switch our attention to the notion of economic reform. We believe that economic reform can be thought of as a package of reform efforts in four major areas (Lipton and Sachs, 1990; Fischer and Gelb, 1991): price liberalization; trade liberalization and current account convertibility; enterprise reform (especially privatization); and the development of the institutional and legal framework for a market economy (including the creation of fluid capital markets) with reform occurring over a finite number of periods. Each of the above reform efforts can be taken in any period of reform. In the most general format the reform technology can be written as:

$$R = \left\{ R_t^i \right\}, t=1, \dots, T; i=1, \dots, N \quad (1)$$

where R_t^i is a reform effort of type i undertaken by the government in period t .

We assume that all system-related changes, such as economic reform (\bar{R}_t), have a negative impact on the efficiency of the domestic production technology and have a positive effect on the internationally standard technology to produce in the country of question. For simplicity we denote the efficiency function that enters domestic technology as:

⁵ It is more realistic to think that there are two types of labor resources: skilled and unskilled labor. In the pre-reform environment skilled and unskilled labor are employed in the traditional sectors of the economy. However, skilled labor receives a wage that is lower than its marginal product. Assuming that private firms require higher quality of labor to use with the new technology and are willing to compensate skilled labor at its marginal product level, skilled labor will start moving to the new sectors of the economy. Thus, production in traditional sector of the economy will fall not only because of the direct effect the economic reform has on the efficiency of traditional sectors, but also because the most productive part of the labor force will leave the traditional sector. Also, if we assume that skilled labor is a complement to the unskilled labor, the fact that skilled labor is leaving the traditional sectors will depress unskilled labor wages, which in turn can reduce the popularity of the economic reform. The above considerations deserve special attention. However, their introduction into the model at this early stage will significantly complicate the derivation and divert the attention from the issues we would like to focus on.

$$\beta(\bar{R}_t) \tag{2}$$

and assume that economic transition from a socialist to a market oriented system negatively effects F^R , i.e., $F_{\beta}^R \beta_R < 0$. We denote the efficiency function that enters the internationally standard technology as:

$$\alpha(\bar{R}_t) \tag{3}$$

Opposite to the efficiency of the domestic sector, we assume that the efficiency of the "internationally standard system of productions" increases as the reform progresses, i.e.

$$F_{\alpha} \alpha_R > 0.$$

For ease of notation we assume that all effort in a particular period can be represented by a scalar R_t and that the government has to make these efforts in the beginning of two consecutive periods, i.e. at $t=0$ and at $t=1$. Thus, our efficiency functions can be written as $\beta=\beta(R_0,R_1)$ for the domestic production system and as $\alpha=\alpha(R_0,R_1)$ for the internationally standard technology, where R_0 represents government actions during the first stage of economic reform, that starts at $t=0$, and R_1 represents government reform efforts during the second and final stage of the economic transition (from $t=1$ to $t=2$).

2.2.2. Cost of the Reform Efforts

Needless to say, government efforts to reform the economy entail direct costs. The government has to allocate substantial resources to design the reform technology, develop and actually build necessary reform infrastructure (e.g., state auctions, property funds) and

also build new market infrastructure, that did not exist in the centrally planned economies.⁶ Of course, different types of reform efforts have different costs. For example, one unit of reform efforts in the area of price liberalization is the least expensive.⁷ On the other hand, one unit of reform effort in the area of privatization or enterprise restructuring is very costly.

We can summarize the assumptions about the economy in the following three equations:

$$Y^R = F^R(\bar{K}^R, \beta(R_0, R_1), L^R) \quad F_K^R > 0, F_\beta^R > 0, F_L^R > 0, \beta_{R_i} < 0 \quad (4)$$

$$Y = F(K, \alpha(R_0, R_1), L) \quad F_K > 0, F_\alpha > 0, F_L > 0, \alpha_{R_i} > 0 \quad (5)$$

$$C(R_0, R_1) \quad C_{R_i} > 0, C_{R_i R_i} > 0 \quad (6)$$

where $F^R(\bullet)$ is domestic (economic system specific) production technology; \bar{K}^R is total endowment of system specific capital, which is assumed to be fixed and used only in the "old" sector; L^R is the labor used in the "old" sector; $F(\bullet)$ is an internationally standard technology, which is available in the world market; K^F is an internationally standard capital that is invested by foreign firms in the country; L is the labor used only in the "new" sector; $C(\bullet)$ is the direct cost of the reform package; R_0 is the government's reform effort at $t=0$; R_1 is the government's reform effort at $t=1$.

⁶ Some authors also add to the above list of direct costs a so called post-reform stabilization package. In my opinion, stabilization is not a part of economic reform, but a segment of traditional package of tools used by every government during periods of economic or financial crisis.

⁷ We do not consider decrease in production as a cost of reform. It is more logical to account for the output losses as for reform outputs but with a negative sign.

2.3. Agents' Decisions

2.3.1. Decisions in the Private Sector

We assume that there are private producers of an internationally standard output Y^F who can borrow capital in the world market and invest it in the country's capital.⁸ We assume that private producers are competitive profit maximizers, who equate the marginal product of invested capital to the cost of purchasing it in the world market. Assuming that our transition economy is large, i.e. that the world price of capital is changing with the quantity of capital invested in the transition economy, private sector makes its investment decision based on the following rule:

$$F_K(K, \alpha(R_0, R_1), L) = r(K) \quad (8)$$

where: $r(K)$ is the world supply of capital; F_K is marginal product of capital used in internationally standard technology; $\alpha(R_0, R_1)$ is the effect of the economic reform on the performance of internationally standard technology in the transition economy; L is labor used in the "new" sector.

From (8) it follows that the total amount of foreign capital in the country has the form:

$$K = K(\alpha(R_0, R_1^c), L) \quad (9)$$

We call (9) "private agents' investment rule".

⁸ We believe that private producers are dominated by foreign firms. First, because at the beginning of reform domestic private sector is very weak, lacks credibility, borrowing power, and access to the international financial markets. Second, even if the owners of that capital are the nationals of transition countries, they prefer to act indirectly through internationally sound foreign firms in order to avoid too much public attention, especially in the beginning of the reform when political tensions are high. Of course, as long as the reform progresses, domestic firms get more experience and better international reputation, and their share in investments in country's capital increases.

2.3.2. Government Decisions

The complex nature of the reform requires that it be implemented by a sovereign government.⁹ The most typical forms of governing in the transition economies are factional and factional-autonomous.¹⁰ For now we assume that we are dealing with a factional-autonomous government. Our government enjoys significant freedom in decision making and is not required to make coalitions with other interest groups to get things started.

All these decisions are constrained by the only government's goal of winning the upcoming elections that will be held at $t=2$. To achieve this goal, by the time of new elections the government has to satisfy the needs of major interest groups in the society, which are: the more influential pro-socialism groups, the less influential pro-socialism groups and the less influential pro-reform groups. We assume that the less influential interest groups are passive observers of the government actions and cannot block or prevent the government from making any action. The less influential pro-socialism interest groups will vote for the current government during the next elections, if by the time of new elections the government will manage at least to maintain a pre-reform level of GNP.¹¹ The less influential pro-reform interest groups will be supportive of the government during the next elections if it, first, puts some efforts into economic reform and, second, by the time

⁹ See Chapter I for definitions of different types of government.

¹⁰ A strong case autonomous-factional state can be post-communist Russia and some other countries of the former Soviet Union. In Russia, for example, the president has to rely on the coalition of different political and economic interest groups in order to be elected through direct presidential elections process. However, after the elections are won, the constitution gives the president a considerable autonomy and freedom from overriding influences of particular economic and political groups, even those that helped him/her to win the elections.

¹¹ We assume that all influential liberal are in the government and their objective to stay in power.

of new elections will manage to maintain at least a pre-reform level of GNP. On the other hand, the more influential interest groups can effectively block the government actions unless their group interests are satisfied. The more influential pro-socialism interest groups do not have power to act but can prevent the government from making moves that are not in line with their group interests. The relationship between the reform-oriented government and other influential interest groups is a very interesting and critical issue of transition. Unfortunately the scope of this dissertation does not allow us to discuss it in details.¹² We simply assume that these groups will not attempt to block government actions if during the process of privatization and enterprise restructuring the government allows them to have some distributional advantages (Campos and Esfahani, 1994).

Given the structure of a country's political spectrum, the government utility can be written as some function of the level of GNP at the time of next elections, either:

$$Z = Z(\text{GNP}), \quad (10)$$

where

$$\text{GNP} = Y^R + Y - F_K K - C(R_0, R_1); \quad (11)$$

$F_K K$ is foreign firms' share of output produced by using internationally standard technology; and $C(R_0, R_1)$ is reform cost function.

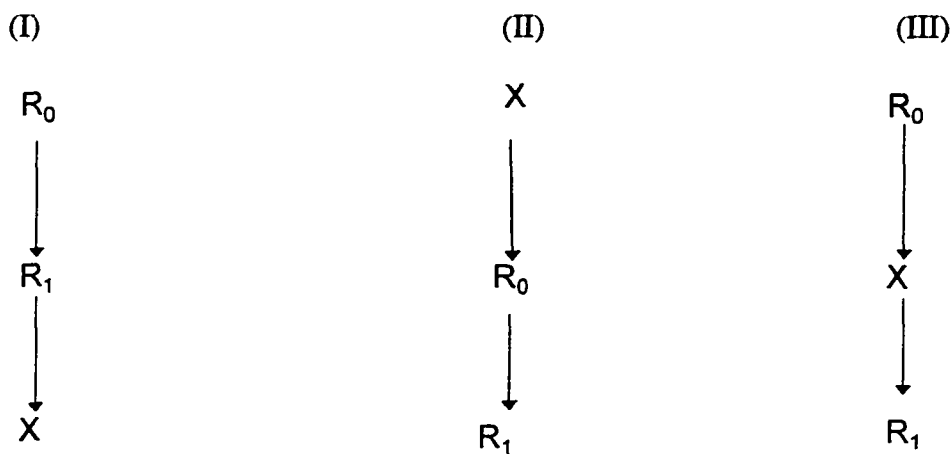
As it has been discussed earlier, there could be two major reasons as to why the government can consider an economic reform as one of its policy options. First, by engaging in the reform activity it attracts political supporters from the less influential

¹² An interesting treatment of the issue is provided by Rodrik (1994), Drazen and Grilli (1993), Bradburd (1993), and Waterbury (1993).

interest groups. Second, it is also possible that by improving the efficiency of economy, positive economic growth will be achieved early enough to attract the political support of the less influential pro-socialism interest groups.

2.4. Sequence of Decisions

Being constrained by two periods, we can think of three possible sequences of government and private sector decisions:



Sequence (I) implies that the government makes all decision at $t=0$ and private agents make their decision only after they observe the actual level of government reform efforts. This sequence of moves is what all foreign investors dream of. However, it is the least realistic and executable of all possible sequences. Early reaction of private sector (foreign and domestic) is essential for government's political survival and continuity of reform efforts. As we will show in the following sections, if the government knows for sure that the private sector will wait until every piece of reform puzzle is in place, the

government will not even bother to start the reform, because of too high risk of political reversal.

Sequence (II) implies that firms move first. Then the government, after it observes private agents' actions, announces the reform program it will follow (or not follow). Again, as it will be shown in the following sections, if foreign firms are required to move first it is more likely that they will not invest anything and the government will be reluctant to start the reform.

Sequence (III) implies that the government moves first and chooses initial reform effort R_0 at $t=0$. Firms observe the government's move at $t=0$, build their expectations about the future of the economic reform (R^e_1) and before the government chooses R_1 make their investments in capital. Then, the government observes the level of foreign investments and chooses R_1 at $t=1$. The government and firms do not move at $t=2$. We believe that Sequence (III) is the most realistic and the most intriguing among all possible sequences of moves and for that reason the following sections are build around this specific sequence of agents' moves.

2.5. Solution Method

2.5.1. An Excursion on Optimum Control Theory

In optimum control theory, open- and closed-loop solutions can be explained as follows. Suppose that the control law of a Markov model is derived as (Whittle, 1982, p. 57):

$$u_t = u(x_t, t) \tag{12}$$

Since u_t in equation (12) depends on the current state, it is known as *feedback* or *closed-loop* control. However, if we can solve for x_t and u_t in terms of an initial condition x_0 , then (12) becomes:

$$u_t = u^*(x_0, t) \quad (13)$$

Equation (13) expresses control as an open-loop, because, in the words of Whittle, "actions are determined by the clock rather than by the current state" (p.57). As Whittle points out, "the closed-loop form has a potential adaptivity to changing circumstances which the open-loop form lacks" (p.57).

These notions of optimum control theory will guide the solution methods we present below. We will now discuss the pre-commitment (or open-loop) and the time consistent (or closed-loop) solutions to our model.

2.5.2. The Pre-commitment Model

In this model we assume that the government can credibly pre-commit to some sequence of reform efforts before the private sector makes its move. The pre-commitment game is played as follows: the government moves first with some reform effort R_0 and at the same time announces the level of reform effort to be accomplished during the second and last period of the reform. Firms observe the reform effort of the government at $t=0$ and make their investments. In determining how much to invest, the private sector uses the fact that at $t=1$ the government has to follow previously announced level of reform.

2.5.2.1. Private Sector Decisions

Because firms correctly believe that the announced at $t=0$ second period level of reform effort is credible and will be actually used by the government, i.e., $R^a_1 = R^0_1$,

firms use this announced value of the reform effort to solve for the total level of investments in the country by substituting it for R_1^e in the private sector decision rule (2) which we rewrite below:

$$F_K(K, \alpha(R_0, R_1), L) = r(K) \quad (14)$$

Solving (14) for K we get the private sector rule for determining the level of investments at $t=0$ as a function of the government reform effort at $t=0$ and expected level of reform effort at $t=1$. We define this rule as:

$$K = K(\alpha(R_0, R_1^e)) \quad (14^*)$$

2.5.2.2. Government Decisions

Because the government knows that the announced levels of reform effort R_1 will determine the level of private investments in the country, it will use the private sector rule to determine the utility maximizing levels of R_0 and R_1 that will be announced to the public and actually used by the government. Mathematically, it is the same as to say that the government makes all its decisions before foreign firms invest. The government chooses R_0 and R_1 such that (15) is maximized. Then, it announces the resulting values of (R_0^0, R_1^0) to the firms. In this case the government decision rule is represented by (17) and (17*). The total level of investments in the country will be determined by substituting (R_0^0, R_1^0) into (14). Formally the government optimization problem can be written as follows:

$$\max_{R_0, R_1} Z = Z(Y^R + Y - F_K K - C(R_0, R_1)) \quad (15)$$

Substituting for Y^R and Y from (4) and (5) and assuming that $Z(\bullet)$ is monotonically increasing we can rewrite (15) as:

$$\max_{R_0, R_1} Z = F^R(\bar{K}^R, \beta(R_0, R_1), L^R) + F(K, \alpha(R_0, R_1), L) - F_K K - C(R_0, R_1) \quad (16)$$

Differentiating (16) with respect to R_0 and R_1 yields the following FOCs:

$$\frac{\partial Z}{\partial R_0} = F_\beta^R \beta_{R_0} + (F_\alpha - KF_{K\alpha})\alpha_{R_0} - KF_{KK} \frac{\partial K}{\partial R_0} - C_{R_0} = 0 \quad (17)$$

$$\frac{\partial Z}{\partial R_1} = F_\beta^R \beta_{R_1} + (F_\alpha - KF_{K\alpha})\alpha_{R_1} - KF_{KK} \frac{\partial K}{\partial R_1} - C_{R_1} = 0 \quad (17^*)$$

Denote this optimal *ex ante* solution by (R_0^0, R_1^0) .

For easier comparison with the time-consistent solution for R_0 and R_1 and graphical representation of the results that follow in the sections below, we can slightly modify our derivations of optimal solutions for pre-commitment model. First, we differentiate (16) with respect to R_1 as in (17*) and get a solution for R_1 as a function of R_0 :

$$R_1^0 = \varphi(R_0^0) \quad (18)$$

Then, substituting (18) back into (16), and differentiating the resulting expression with respect to R_0 , and utilizing the envelope theorem, we get the same FOC as in (17).

2.5.3. The Time Consistent Solution

Suppose that a pre-commitment mechanism does not exist and that the government can costlessly change the level of reform effort it has previously announced. As we will show, once private sector makes its investment decision, it can not respond to the changes in the level of reform effort and therefore, the government has an incentive to postpone

some of the reforms. Thus, the rules proposed by (17) and (17*) are not time consistent and are therefore not credible to private agents. In the absence of pre-commitment mechanism, the only credible reform package, is the time-consistent reform package, since it is the sub-game perfect solution to this problem. We now present the time-consistent game.

As before, for the time-consistent game we assume that the government has to move first and choose an initial reform effort R_0 at $t=0$. Firms observe R_0 and make their investments in country's capital. Then, based on the private sector investment decisions the government chooses R_1 at $t=1$.

The time-consistent solution requires that firms' expectations be correct and that the *ex post* reform effort R_1 set by the government be optimal. Formally, the time-consistent, no-pre-commitment solution is derived as follows.

2.5.3.1. Government's Decisions. Stage 1

Suppose that the government has already chosen some level of R_0 and that firms responded with some level of investments. We denote these values as \hat{R}_0 and \hat{K} . Thus, at $t=1$ the government optimization problem can be written as follows:

$$\max_{R_1} Z = F^R(\bar{K}^R, \beta(\hat{R}_0, R_1), L^R) + F(\hat{K}, \alpha(\hat{R}_0, R_1), L) - F_K \hat{K} - C(\hat{R}_0, R_1) \quad (19)$$

$$\frac{\partial Z}{\partial R_1} = F_{\beta}^R \beta_{R_1} + (F_{\alpha} - KF_{K\alpha}) \alpha_{R_1} - C_{R_1} = 0 \quad (20)$$

Equation (20) gives us the government rule of determining the level of R_1 as a function of \hat{R}_0 and \hat{K} . We call this rule

$$R_1 = \sigma(R_0, K) \quad (21)$$

It can be seen that the FOC for determining the optimal level of R_1 is different from the pre-commitment case by the term $\left(-\hat{K}F_{KK} \frac{\partial K}{\partial R_1}\right)$. This term is not present in our time consistent condition due to the fact that private sector, after having made its investment decision, is not able to react to the changes in the level of reform effort, i.e. $\frac{\partial K}{\partial R_1} = 0$.

2.5.3.2. Private Sector Decisions

Private agents' response to the fact that the government can change previously announced level of reform effort at $t=1$ is determined by (22) through (24). As one can see, instead of using the announced levels of reform effort, private agents use the government rule (13) to determine the level of investments in the country. Thus, substituting the government rule into their decision rule we have:

$$F_K(K, \alpha(R_0, R_1), L) = r(K) \quad (22)$$

$$R_1 = \sigma(R_0, K) \quad (23)$$

$$R_1^e = R_1 \quad (24)$$

Substituting (24) and (23) into (22) and solving for K we get the private sector rule for determining time consistent level of investments at $t=0$ as a function of the government reform effort at $t=0$. We define this rule as:

$$\tilde{K} = k(R_0) \quad (25)$$

2.5.3.3. Government's Decisions. Stage 2

At this stage the government has to determine the optimal level of reform effort at $t=0$. We assume that the government knows that firms know the government rule (23) and will use it to solve for K . We also assume that firms use (23) to determine the level of investments in country's capital. Thus, the government has to use all this knowledge to choose the level of R_0 such that the government utility is maximized. First, it substitutes (25) into (23) and gets the government rule of determining the level of reform effort as a function of R_0 only. We denote this rule as:

$$\tilde{R}_1 = \sigma(R_0, k(R_0)) = \delta(R_0) \quad (26)$$

Thus, the government optimization problem at the beginning of the reform can be written as follows:

$$\underset{R_0}{\text{Max}} Z = F^R(\bar{K}^R, \beta(R_0, \tilde{R}_1), L^R) + F(\tilde{K}, \alpha(R_0, \tilde{R}_1), L) - F_K(\tilde{K}, \alpha(R_0, \tilde{R}_1), L) \tilde{K} - C(R_0, \tilde{R}_1) \quad (27)$$

FOC for (27):

$$\frac{\partial Z}{\partial R_0} = F_\beta^R \frac{d\beta}{dR_0} + (F_\alpha - KF_{K\alpha}) \frac{d\alpha}{dR_0} - KF_{KK} \frac{d\tilde{K}}{dR_0} - (C_{R_0} + C_{R_1} \delta_{R_0}) = 0 \quad (28)$$

where

$$\frac{d\beta}{dR_0} = \beta_{R_0} + \beta_{R_1} \delta_{R_0} \quad (29)$$

$$\frac{d\alpha}{dR_0} = \alpha_{R_0} + \alpha_{R_1} \delta_{R_0} \quad (30)$$

$$\frac{d\tilde{K}}{dR_0} = k_{R_0} \quad (32)$$

Using the Envelope Theorem, i.e. utilizing the fact that

$$F_{\beta}^R \beta_{R_1} + F_{\alpha} \alpha_{R_1} - \hat{K} F_{K\alpha} \alpha_{R_1} - C_{R_1} = 0$$

from (20), we can rewrite (28) as:

$$\frac{\partial Z}{\partial R_0} = F_{\beta}^R \beta_{R_0} + F_{\alpha} \alpha_{R_0} - K F_{KK} \frac{d\tilde{K}}{dR_0} - C_{R_0} = \quad (33)$$

2.5.4. Pre-commitment vs. Time Consistent Solution for R_1 and R_0 .

At this point we can derive some interesting partial results related to government behavior during the transition. But first we write down the FOCs for the time consistent and pre-commitment models side by side for easier comparison.

For the pre-commitment model the FOCs are:

$$\frac{\partial Z}{\partial R_0} = F_{\beta}^R \beta_{R_0} + (F_{\alpha} - K F_{K\alpha}) \alpha_{R_0} - K F_{KK} \frac{\partial K}{\partial R_0} - C_{R_0} = 0 \quad (38)$$

$$\frac{\partial Z}{\partial R_1} = F_{\beta}^R \beta_{R_1} + (F_{\alpha} - K F_{K\alpha}) \alpha_{R_1} - K F_{KK} \frac{\partial K}{\partial R_1} - C_{R_1} = 0 \quad (38^*)$$

$$\text{where } \frac{\partial K}{\partial R_i} = \frac{F_{K\alpha}}{F_{KK} - r_K} \alpha_{R_i} \quad (39)$$

For the time consistent model FOCs are:

$$\frac{\partial Z}{\partial R_0} = F_{\beta}^R \beta_{R_0} + (F_{\alpha} - K F_{K\alpha}) \alpha_{R_0} - K F_{KK} \frac{d\tilde{K}}{dR_0} - C_{R_0} = 0 \quad (40)$$

$$\frac{\partial Z}{\partial R_1} = F_{\beta}^R \beta_{R_1} + (F_{\alpha} - K F_{K\alpha}) \alpha_{R_1} - C_{R_1} = 0 \quad (40^*)$$

$$\text{where } \frac{d\tilde{K}}{dR_0} = \frac{F_{K\alpha}}{F_{KK} - r_K} (\alpha_{R_0} + \alpha_{R_1} \delta_{R_0}) \quad (42)$$

At this point we can draw more specific conclusions about the differences in the solutions for the pre-commitment and the time consistent model.

Proposition I.

Starting from the pre-commitment levels of reform efforts and investments and assuming that R_0^0 and K are fixed, $F_{KK} < 0$ and the return to capital increases as the reform progresses (i.e. $F_{K\alpha} > 0$), the inability of the government to pre-commit to the *ex ante* level of reform effort results in a lower level of reform efforts in the second and final period of reform.

Proof:

Evaluating (38*) at the time consistent level of R_1 (40*) we have

$$\left. \frac{\partial Z}{\partial R_1} \right|_{K^0, R_0^0, \bar{R}_1} = KF_{KK} \frac{F_{K\alpha}}{F_{KK} - r_K} \alpha_{R_1} > 0 \quad (43)$$

It follows that the value of $\frac{\partial Z}{\partial R_1}$ evaluated at time consistent levels of R_1 and assuming that the levels of R_0^0 and K are unchanged, is positive. It means that the optimal level of reform effort at $t=1$, when pre-commitment mechanism is in place, is somewhere to the right (or higher) from the optimal time-consistent level.

Proposition II.

Starting from the pre-commitment levels of reform efforts and investments and assuming that R_1^0 and K are fixed and $\delta_{R_0} \neq 0$, the inability of the government to pre-

commit to the *ex ante* level of reform effort results in a different level of reform efforts in the first period of reform.

Proof:

Evaluating (38) at the time consistent level of R_0 (40) we have

$$\left. \frac{dZ}{dR_0} \right|_{K^0, R_1^0, \tilde{R}_0} = KF_{KK} \left(\frac{d\tilde{K}}{dR_0} - \frac{\partial K}{\partial R_0} \right) = KF_{KK} \frac{F_{K\alpha}}{F_{KK} - r_K} \alpha_{R_1} \delta_{R_0} \begin{matrix} > 0 \\ < 0 \end{matrix} \text{ as } \delta_{R_0} \begin{matrix} > 0 \\ < 0 \end{matrix} \quad (44)$$

It may be seen that the sign of (44) depends on the specific characteristics of the "government rule" functions: $\tilde{R}_1 = \delta(R_0)$ for the time-consistent model, which in turn depends on the specific characteristics of the domestic and international production technology and the sensitivity of these production functions to the changes in the reform efforts. The derivative δ_{R_0} is very hard to sign unless we use some specific functional forms and parameters.

We can provide the following explanation for why the sign in (44) is ambiguous. On one hand, the fact that the government knows that the foreign firms know that part of the reforms will be reversed, tend to reduce R_0 . On the other hand, since R_0 and R_1 are substitutes, reduction in R_1 causes R_0 to increase. Which of these two effects dominate the other depends on the functional form of production, cost and reform technology functions we choose to use in order to derive more specific results.

2.6. Specific Example of the Two Models of Economic Reform

2.6.1. Specific Assumptions

To understand how the government and private sector respond to the fact that there is no a pre-commitment mechanism that can force the government to follow the announced course of reform we will work out an example of the two models by using some specific functional forms for production and reform technologies. We assume that:

1. Internationally standard production technology is Cobb-Douglas of the form:

$$F = \alpha(R_0, R_1) K^\lambda \bar{L}^{1-\lambda} \quad (45)$$

2. The world price of capital is constant, i.e.

$$F_K = \lambda \alpha(R_0, R_1^e) K^{\lambda-1} \bar{L}^{1-\lambda} = r \quad (46)$$

3. The total return to capital is:

$$K F_K = \lambda \alpha(R_0, R_1) K^\lambda \bar{L}^{1-\lambda} \quad (47)$$

4. The losses in the efficiency of domestic production associated with the economic reform are included in the expression for the cost of reform function and for that reason domestic production is not any more a function of reform efforts.

Given the above assumptions, the government objective function can be written as follows:

$$\begin{aligned} Z &= Y^R + Y - F_K K - C(R_0, R_1) \\ &= (\bar{K}^R)^\lambda (\bar{L}^R)^{1-\lambda} + (1-\lambda) \alpha K^\lambda L^{1-\lambda} - C(R_0, R_1) \\ &= B + (1-\lambda) \alpha K^\lambda L^{1-\lambda} - C(R_0, R_1) \end{aligned} \quad (48)$$

$$\text{where } B = (\bar{K}^R)^\lambda (\bar{L}^R)^{1-\lambda} \quad (49)$$

2.6.2. Solutions for the pre-commitment model

2.6.2.1. Private sector decisions

Using the rule in (46) and correctly assuming that $R_1^e = R_1$, private sector makes its investment decision. The specific functional form we used to specify the internationally standard technology allows us to get the explicit expression for the total level of investments in the country, when the pre-commitment mechanism is in place. That is,

$$K = \left(\frac{\lambda}{r}\right)^{\frac{1}{1-\lambda}} \alpha(R_0, R_1)^{\frac{1}{1-\lambda}} \bar{L} \quad (50)$$

2.6.2.2. Government Decisions

Because the government is forced to make all its decisions about the reform efforts before foreign firms invest, we can substitute the private sector investment rule (50) into the government objective function (48) before performing optimization. Thus, the government's objective function can be rewritten as:

$$Z = B + A \alpha(R_0, R_1)^{\frac{1}{1-\lambda}} - C(R_0, R_1) \quad (51)$$

where

$$A = (1-\lambda) \bar{L} \left(\frac{\lambda}{r}\right)^{\frac{\lambda}{1-\lambda}} \quad (51^*)$$

Given the expression for Z in (51), the FOCs for the pre-commitment model have the following form:

$$Z_{R_0} = \left(\frac{A}{1-\lambda}\right)(\alpha(R_0, R_1))^{1-\lambda} \alpha_{R_0} - C_{R_0} = 0 \quad (52)$$

$$Z_{R_1} = \left(\frac{A}{1-\lambda}\right)(\alpha(R_0, R_1))^{1-\lambda} \alpha_{R_1} - C_{R_1} = 0 \quad (52^*)$$

To proceed further we have to make some additional assumptions about the form of the efficiency and reform cost function, and the values of some model parameters. We assume that:

1. The productivity function for the internationally standard production has the form:

$$\alpha = (1 + mR_0 + nR_1)^{\frac{1}{2}} \quad (53)$$

Given (53) note that:

$$\alpha \alpha_{R_1} = \frac{1}{2}n \quad (54)$$

$$\alpha \alpha_{R_0} = \frac{1}{2}m \quad (55)$$

3. The reform cost function is:

$$C = a_0R_0 + a_1R_1 + \frac{b_0}{2}R_0^2 + \frac{b_1}{2}R_1^2 - b_2R_0R_1 \quad (56)$$

where parameters satisfy the following SOC's

$$\begin{pmatrix} b_0 & -b_2 \\ -b_2 & b_1 \end{pmatrix} = b_0b_1 - b_2^2 > 0, \quad b_0 > 0, \quad b_1 > 0$$

$$C_{R_0} = a_0 + b_0R_0 - b_2R_1 \quad (57)$$

$$C_{R_1} = a_1 + b_1R_1 - b_2R_0 \quad (58)$$

$$C_{R_1 R_1} = b_1 \quad (59)$$

$$C_{R_1 R_0} = b_2 \quad (60)$$

$$C_{R_0 R_0} = b_0 \quad (61)$$

$$4. \text{ Labor and capital are equally productive, i.e. } \lambda = 1/2 \quad (62)$$

Given the above assumptions (53-62) we can derive very specific solutions for the pre-commitment and time consistent models. Continuing with the pre-commitment model and plugging (53-62) into (52-52*) we get the following expressions for the FOCs for the pre-commitment model:

$$Z_{R_0} = J_0^0(R_0, R_1) = Am - a_0 - b_0 R_0 + b_2 R_1 = 0 \quad (63)$$

$$Z_{R_1} = J_1^0(R_0, R_1) = An - a_1 - b_1 R_1 + b_2 R_0 = 0 \quad (63^*)$$

Solving (63) and (63*) for R_0^0 and R_1^0 we have:

$$\begin{bmatrix} R_1 \\ R_0 \end{bmatrix} = \frac{\begin{bmatrix} b_0 & b_2 \\ b_2 & b_1 \end{bmatrix} \begin{bmatrix} An - a_1 \\ Am - a_0 \end{bmatrix}}{(b_0 b_1 - b_2^2)} \quad (64)$$

For future reference and graphical representation of the solution to the pre-commitment model we can rewrite (63) and (63*) as follows:

From (63*) we have:

$$R_1 = \varphi^1(R_0) = \frac{An - a_1}{b_1} + \frac{b_2}{b_1} R_0 \quad (65)$$

$$\left. \frac{dR_1}{dR_0} \right|_{Z_{R_1}=0} = -\frac{J_1^0 R_0}{J_1^0 r_1} = \varphi^1_{R_0} = \frac{b_2}{b_1} \quad (66)$$

From (63) we have:

$$R_1 = \varphi^0(R_0) = \frac{a_0 - Am}{b_2} + \frac{b_0}{b_2} R_0 \quad (67)$$

$$\left. \frac{dR_1}{dR_0} \right|_{Z_{R_0}=0} = -\frac{J_0^0 R_0}{J_0^0 r_1} = \varphi^0_{R_0} = \frac{b_0}{b_2} \quad (68)$$

The equilibrium levels of reform efforts will be at the point where $\varphi^0(R_0) = \varphi^1(R_0)$. We can graph the expressions in (65) and (67) in (R_0, R_1) space (Figure 1).

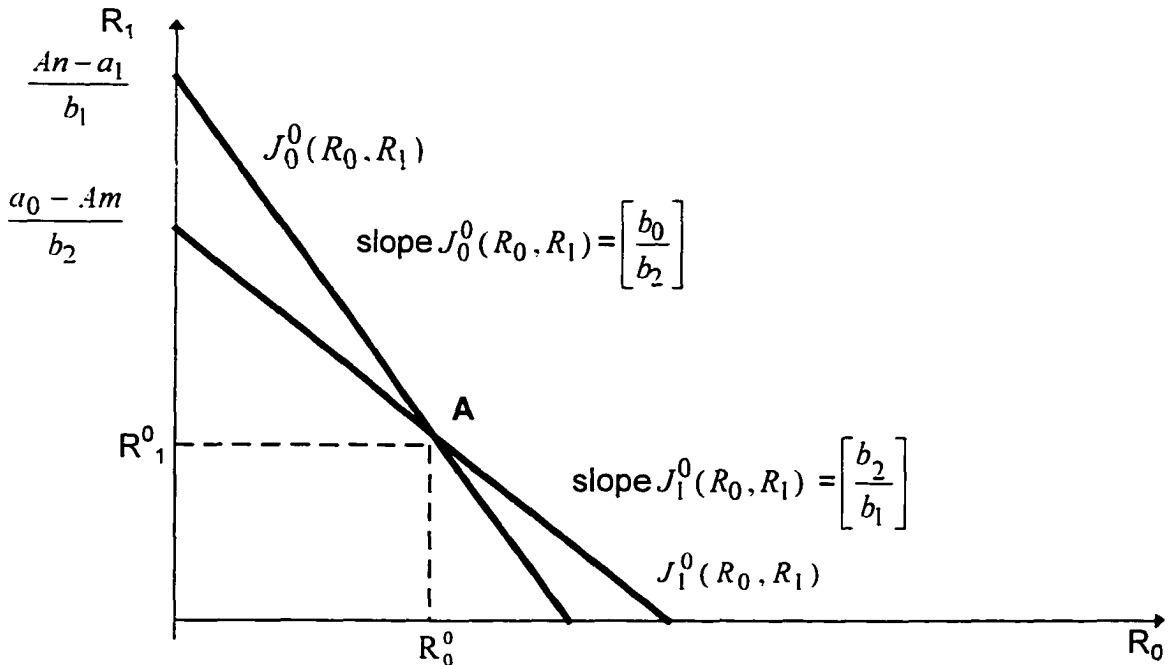


Figure 1. Graphical representation of the solution for the pre-commitment model.
Case $b_2 < 0$

Note, that in order for the SOCs to be satisfied the locus of $J_1^0(R_0, R_1)$ has to cut $J_0^0(R_0, R_1)$ from below.

2.6.3. Solutions for the Time Consistent Model

The time-consistent solution will be derived as it has been proposed in section 2.5.

First we differentiate

$$Z = B + (1 - \lambda)\alpha(R_0, R_1)K^\lambda \bar{L}^{1-\lambda} - C(R_0, R_1) \quad (69)$$

with respect to R_1 to get the government rule of determining the optimal level of reform at $t=1$ as a function of K and R_0 :

$$Z_{R_1} \Big|_{K, R_0} = (1 - \lambda)K^\lambda \bar{L}^{1-\lambda} \alpha_{R_1} - C_{R_1} = 0 \quad (70)$$

Substituting for K from the private sector investment rule

$$F_K = \lambda\alpha(R_0, R_1^e)K^{\lambda-1}\bar{L}^{1-\lambda} = r \quad (46) \text{ and assuming perfect foresight, i.e. that}$$

($R_1^e(R_0) = R_1(R_0)$), we get an expression for the government rule of determining the optimal time consistent level of R_1 as a function of R_0 only, i.e.:

$$Z_{R_1} \Big|_{R_0} = A\alpha^{\frac{\lambda}{1-\lambda}} \alpha_{R_1} - C_{R_1} = 0 \quad (71)$$

By using the additional assumptions (53-62) and plugging them into (70), the second period FOC for the time consistent model can be written as follows:

$$Z_{R_1} \Big|_{K, R_0} = J_1^C(R_0, R_1) = A\frac{n}{2} - a_1 - b_1 R_1 + b_2 R_0 = 0 \quad (72)$$

Solving for R_1 we get the government rule of determining the level of reform effort in the second period as a function of R_0 and some constant parameters, i.e.:

$$R_1 = \delta(R_0) = \frac{An - 2a_1}{2b_1} + \frac{b_2}{b_1} R_0 \quad (73)$$

$$\delta_{R_0} = \frac{b_2}{b_1} \quad (74)$$

Substituting (73) first in to the private sector rule (50) and then (50) into (69) we get the following expression for the government objective function:

$$Z = B + A(\alpha(R_0, \delta(R_0)))^{\frac{1}{1-\lambda}} - C(R_0, \delta(R_0)) \quad (75)$$

By differentiating (75) with respect to R_0 the government can get the optimal level of reform effort it should use at $t=0$, i.e.:

$$Z_{R_0} = \left(\frac{A}{1-\lambda} \alpha^{\frac{\lambda}{1-\lambda}} \alpha_{R_0} - C_{R_0} \right) + \left(\frac{A}{1-\lambda} \alpha^{\frac{\lambda}{1-\lambda}} \alpha_{R_1} - C_{R_1} \right) \delta_{R_0} = 0 \quad (76)$$

Noting from (71) that $\frac{A}{1-\lambda} \alpha^{\frac{\lambda}{1-\lambda}} \alpha_{R_1} = \frac{C_{R_1}}{1-\lambda}$

we can rewrite (76) as:

$$Z_{R_0} = \left(\frac{A}{1-\lambda} \alpha^{\frac{\lambda}{1-\lambda}} \alpha_{R_0} - C_{R_0} \right) + \left(\frac{\lambda C_{R_1}}{1-\lambda} \right) \delta_{R_0} = 0 \quad (77)$$

Again using the additional assumptions (53-62) and plugging them into the FOC for the first period of reform we have:

$$Z_{R_0} = J_0^C(R_0, R_1) = \left(Am + a_1 \frac{b_2}{b_1} - a_0 \right) - \left(\frac{b_2^2}{b_1} + b_0 \right) R_0 + 2b_2 R_1 = 0 \quad (78)$$

Rewriting the two FOCs for the time-consistent model together

$$Z_{R_1} \Big|_{K, R_0} = J_1^C(R_0, R_1) = A \frac{n}{2} - a_1 - b_1 R_1 + b_2 R_0 = 0 \quad (79)$$

$$Z_{R_0} = J_0^C(R_0, R_1) = \left(Am + a_1 \frac{b_2}{b_1} - a_0 \right) - \left(\frac{b_2^2}{b_1} + b_0 \right) R_0 + 2b_2 R_1 = 0 \quad (79^*)$$

we can solve the two FOCs to get explicit solutions for R_0 and R_1 for the time consistent model. From (79) and (79*) we have the solution of the form

$$\begin{bmatrix} R_1 \\ R_0 \end{bmatrix} = \frac{\begin{bmatrix} \frac{b_2^2}{b_1} + b_0 & b_2 \\ 2b_2 & b_1 \end{bmatrix} \begin{bmatrix} A \frac{n}{2} - a_1 \\ Am + a_1 \frac{b_2}{b_1} - a_0 \end{bmatrix}}{b_0 b_1 - b_2^2} \quad (80)$$

2.7. Summary of the Results and Graphical Representation of the Two Models

As one can see from Table 1, the FOCs for the time consistent and the pre-commitment models are different. Comparing (4) and (4*) we can see that the optimal level of reform effort R_1^0 in the second period is larger than that in the time consistent model R_1^C . On the other hand, the solutions for the first period reform effort stay unchanged. It means that the total reform effort of the government is lower under the time-consistent model.

We provide a graphical representation of the solutions to the models below. For this only reason we rewrote the FOCs for the two models in the form presented in the equations (7), (9), (7*) and (9*) and graphed them in the R_0 R_1 space for the two cases: $b_2 < 0$ and $b_2 > 0$.

Table 1. Summary of Results

The Pre-commitment Model	The Time Consistent Model
FOCs	FOCs
$Z_{R_1 _{R_0}} = An - a_1 - b_1 R_1 + b_2 R_0 = 0 \quad (1)$	$Z_{R_1 _{K, R_0}} = A \frac{n}{2} - a_1 - b_1 R_1 + b_2 R_0 = 0 \quad (1^*)$
$Z_{R_0 _{R_1}} = Am - a_0 - b_0 R_0 + b_2 R_1 = 0 \quad (2)$	$Z_{R_0} = \left(Am + a_1 \frac{b_2}{b_1} - a_0 \right) - \left(\frac{b_2^2}{b_1} + b_0 \right) R_0 + 2b_2 R_1 = 0 \quad (2^*)$
$\begin{bmatrix} R_1 \\ R_0 \end{bmatrix} = \frac{\begin{bmatrix} b_0 & b_2 \\ b_2 & b_1 \end{bmatrix} \begin{bmatrix} An - a_1 \\ Am - a_0 \end{bmatrix}}{(b_0 b_1 - b_2^2)} \quad (3)$	$\begin{bmatrix} R_1 \\ R_0 \end{bmatrix} = \frac{\begin{bmatrix} \frac{b_2^2}{b_1} + b_0 & b_2 \\ 2b_2 & b_1 \end{bmatrix} \begin{bmatrix} A \frac{n}{2} - a_1 \\ Am + a_1 \frac{b_2}{b_1} - a_0 \end{bmatrix}}{b_0 b_1 - b_2^2} \quad (3^*)$
From (3)	From (3*)
$R_1^0 = \frac{b_0(An - a_1) + b_2(Am - a_0)}{b_0 b_1 - b_2^2} \quad (4)$	$R_1^C = \frac{\left(\frac{b_2^2}{b_1} + b_0 \right) \left(A \frac{n}{2} - a_1 \right) + b_2 \left(Am + a_1 \frac{b_2}{b_1} - a_0 \right)}{b_0 b_1 - b_2^2} \quad (4^*)$
$R_0^0 = \frac{b_2(An - a_1) + b_1(Am - a_0)}{b_0 b_1 - b_2^2} \quad (5)$	$R_0^C = \frac{b_2(An - a_1) + b_1(Am - a_0)}{b_0 b_1 - b_2^2} \quad (5^*)$
$K^0 = \left(\frac{1}{2r} \right)^2 (1 + mR_0^0 + nR_1^0) \bar{L} \quad (6)$	$K^C = \left(\frac{1}{2r} \right)^2 (1 + mR_0^C + nR_1^C) \bar{L} \quad (6^*)$

Table 1. Summary of Results (Continues)

The Pre-commitment Model	The Time Consistent Model
From (1)	From (1*)
$R_1 = \varphi^1(R_0) = \frac{An - a_1}{b_1} + \frac{b_2}{b_1} R_0 \quad (7)$	$R_1 = \delta^1(R_0) = \frac{An - 2a_1}{2b_1} + \frac{b_2}{b_1} R_0 \quad (7^*)$
$\left. \frac{dR_1}{dR_0} \right _{Z_{R_1}=0} = -\frac{J_1^0 R_0}{J_1^0 R_1} = \varphi_{R_0}^1 = \frac{b_2}{b_1} \quad (8)$	$\left. \frac{dR_1}{dR_0} \right _{Z_{R_1}=0} = \frac{J_1^C R_0}{J_1^C R_1} = \delta_{R_0} = \frac{b_2}{b_1} \quad (8^*)$
From (2)	From (2*)
$R_1 = \varphi^0(R_0) = \frac{a_0 - Am}{b_2} + \frac{b_0}{b_2} R_0 \quad (9)$	$R_1 = \delta^0(R_0) = \frac{\left(a_0 - Am - a_1 \frac{b_2}{b_1} \right)}{2b_2} + \frac{\frac{b_2^2}{b_1} + b_0}{2b_2} R_0 \quad (9^*)$
$\left. \frac{dR_1}{dR_0} \right _{Z_{R_0}=0} = -\frac{J_0^0 R_0}{J_0^0 R_1} = \varphi_{R_0}^0 = \frac{b_0}{b_2} \quad (10)$	$\left. \frac{dR_1}{dR_0} \right _{Z_{R_0}=0} = \frac{J_0^C R_0}{J_0^C R_1} = \delta_{R_0}^0 = \frac{\frac{b_2^2}{b_1} + b_0}{2b_2} \quad (10^*)$

Figure 2 represents the case when $b_2 < 0$. This parametrization represents the case when all four first order conditions loci for the pre-commitment and time-consistent models are negatively sloped. Also by the SOC the locus of FOC with respect to the first period reform effort ($J_0^0(R_0, R_1)$) is steeper than the FOC with respect to the second period reform effort ($J_1^0(R_0, R_1)$) in the pre-commitment model, i.e. $J_1^0(R_0, R_1)$ cuts $J_0^0(R_0, R_1)$ from below. Also note from (8) and (8*) that the slopes of $J_1^0(R_0, R_1)$ and

$J_1^C(R_0, R_1)$ are the same. It implies that the locus of the FOC with respect to the second period reform effort in the time consistent model lies everywhere below and parallel to the locus of the FOC with respect to the second period reform effort in the pre-commitment model. The fact that the first period reform effort stays unchanged implies that the locus of the FOC with respect to the first period reform effort in the time consistent model is steeper than that in the pre-commitment model. Point A represents the equilibrium point for the pre-commitment model, i.e. the point where two first order conditions loci $J_0^0(R_0, R_1)$ and $J_1^0(R_0, R_1)$ intersect. Point B represents the point of intersection of the two FOCs $J_0^C(R_0, R_1)$ and $J_1^C(R_0, R_1)$ for the time consistent model.

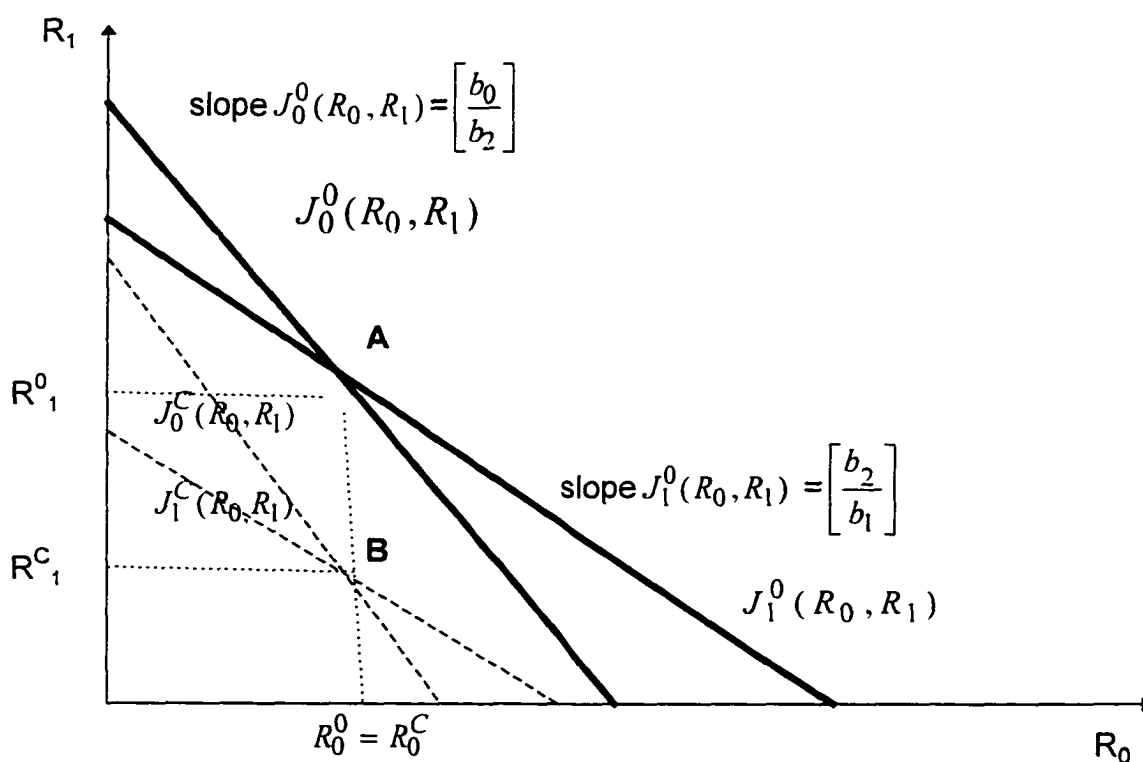


Figure 2. Comparing the pre-commitment and time consistent solutions. Case $b_2 < 0$

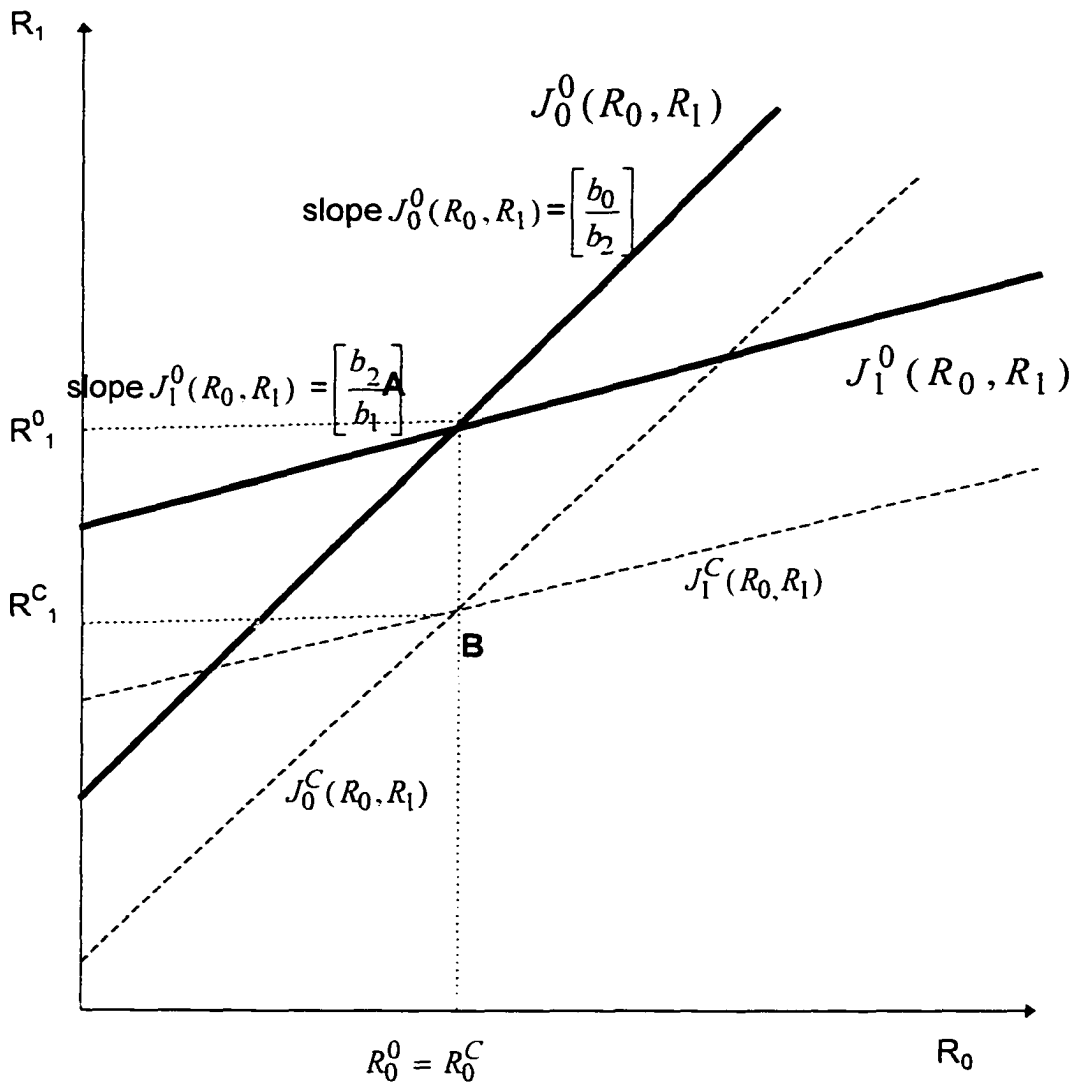


Figure 3. Comparing the pre-commitment and time consistent solutions. Case $b_2 > 0$

Figure 3 represents the case when $b_2 < 0$. If $b_2 > 0$ we get positively sloped loci of the four first order conditions in R_0 and R_1 space.

2.8. Economic Reform and Risk of Political Reversal

Until this moment we assumed that, even in the short-run, the benefits from economic reform are greater than the losses associated with the transition. Thus, even a

selfish government finds it optimal to follow the course of economic reform. However, it is possible that the short-run losses associated with the economic reform might be greater than the short-run benefits. In this case, a selfish government will be reluctant to start the economic reform, unless the international financial institutions provide the government with sufficient incentives.

We also assumed that the government is only concerned with the final level of output that could be generated from two reform efforts. However, it is not a secret that one of the arguments against economic reform is that it could cause immediate and dramatic reduction in the level of output, which in turn results in strong political opposition to economic reform and in eventual political reversal. Sometimes the fear of Communists' comeback can be so strong that even a reform-oriented government will be reluctant to follow the course of economic reform. One can argue that people are not myopic and that they realize the fact that temporary decline in standard of living is inevitable. In response to this possible argument we can find plenty of reasons besides myopia (which can not be completely eliminated as a factor) that can explain why a temporary economic downfall can result in political reversal. The first reason can be related to the imperfection of capital markets during the period of transition. In the market-based economies this imperfection encourages people to save during the good times in their work situation and draw on these savings during the bad times. By following this "income-smoothing" strategy people can sustain relatively long periods of unemployment or some other extra-ordinary events that require substantial sums of money. In the former socialist countries this traditional

"income-smoothing" strategy was impossible to follow. People were not allowed to save cash or buy assets in excess of their personal or family needs. So called "under the mattress" savings were probably the only possibility of following "the income smoothing" type of behavior. However, very few people (retailers, small farmers, black-market entrepreneurs, and etc.) under the socialist regime had access to cash and could follow this archaic form of "income smoothing" behavior. The rest of the population had to rely entirely on wage salary and the government's promises of stability and prosperity in the future. The collapse of the traditional system of production caused by the economic reform, was not only a matter of losing a job, but literally a matter of losing the last and sometimes the only source of income and, consequently, a matter of their own and their families survival. Under these circumstances, the people's patience is very limited and not a myopia, but a simple need for basic means of physical existence (which is promised by the communists) becomes a reason for a political reversal.

Another line of "non-myopic" reasons for why the government can choose to stay out of the reform path can be related to the fact that the benefits of economic reform are not equally distributed among all members of the society. It is more likely that even if the total level of GNP will grow relative to the pre-reform level, there will be more losers than winners. Thus, the higher the initial reform effort, the more people will lose and less people will vote for the government re-election.

To capture this idea, we assume that during the transition period a certain probability that the communist government can come back to power exists and depends on the initial level of reform effort R_0 .

Assuming risk neutrality, the private-sector optimization problem can be written as follows:

$$E[\pi] = \eta(R_0)(F(K, \alpha(R_0, R_1^e), L) - rK) + (1 - \eta(R_0))(-rK) \quad (81)$$

where $\eta(R_0)$ is the probability that the communist government will not come to power during the transition period.

Optimizing with respect to K we have the following FOC:

$$\frac{\partial E[\pi]}{\partial K} = \eta(R_0)(F_K - r) + (1 - \eta(R_0))(-r) = 0 \quad (82)$$

Simplifying (82) we get the private sector rule of determining the level of investments in the transition economy of the form:

$$\eta(R_0)F_K = r \quad (83)$$

From (83) we have:

$$K = Q(\eta(R_0), \alpha(R_0, R_1^e), L, r)$$

Assuming risk neutrality and no domestic production Y^R the government optimization problem can be written as follows:

$$E[Z] = \eta(R_0) (F - F_K K - C(R_0, R_1)) + (1 - \eta(R_0))V \quad (84)$$

or

$$E[Z] = \eta(R_0) (F - F_K K - C(R_0, R_1) - V) + V \quad (85)$$

where $\eta(R_0)$ is the probability that the communist government will not come to power during the transition period; $V < 0$ is some constant parameter, representing the disutility that the government derives if the communist coup occurs. We assume that $\eta_{R_0} < 0$, i.e. that the probability that the communist coup will not happen is decreasing function of the reform effort at $t=0$.

FOCs for the pre-commitment case with constant world prices will have the following form:

$$\begin{aligned} \frac{\partial E[Z]}{\partial R_0} &= \eta(R_0)((F_\alpha - KF_{K\alpha})\alpha_{R_0} - KF_{KK} \frac{\partial K}{\partial R_0} - C_{R_0}) \\ &+ \eta_{R_0}(F - F_K K - C(R_0, R_1) - V) = 0 \end{aligned} \quad (86)$$

$$\frac{\partial E[Z]}{\partial R_1} = F_\beta^R \beta_{R_1} + (F_\alpha - KF_{K\alpha})\alpha_{R_1} - KF_{KK} \frac{\partial K}{\partial R_1} - C_{R_1} = 0 \quad (86^*)$$

Denote this optimal *ex ante* solution by $(\bar{R}_0^0, \bar{R}_1^0)$.

For easier comparison we rewrite the FOCs for the pre-commitment model without risk of political reversal below:

$$\frac{\partial Z}{\partial R_0} = F_\beta^R \beta_{R_0} + (F_\alpha - KF_{K\alpha})\alpha_{R_0} - KF_{KK} \frac{\partial K}{\partial R_0} - C_{R_0} = 0 \quad (87)$$

$$\frac{\partial Z}{\partial R_1} = F_\beta^R \beta_{R_1} + (F_\alpha - KF_{K\alpha})\alpha_{R_1} - KF_{KK} \frac{\partial K}{\partial R_1} - C_{R_1} = 0 \quad (87^*)$$

Obviously the FOCs for the second period reform efforts are the same, meaning that the loci of the two FOCs coincide with each other. On the other hand, if we evaluate the FOC for the first reform effort in the model without the risk of political reversal at the

optimal level in the model with political reversal we get the following:

$$\left. \frac{\partial E[Z^0]}{\partial R_0} \right|_{\frac{\partial Z}{\partial R_0}=0} = \eta_{R_0} (Y^R + Y - F_K K - C(R_0, R_1) - V) < 0 \quad (88)$$

It follows that under the risk of political reversal, the government will have a tendency to put less efforts into the reform during the first and more during the second period of transition (Figure 4). It is possible that with sufficiently high levels of the probability of political reversal the government can be better off by choosing zero-reform effort at $t=0$.

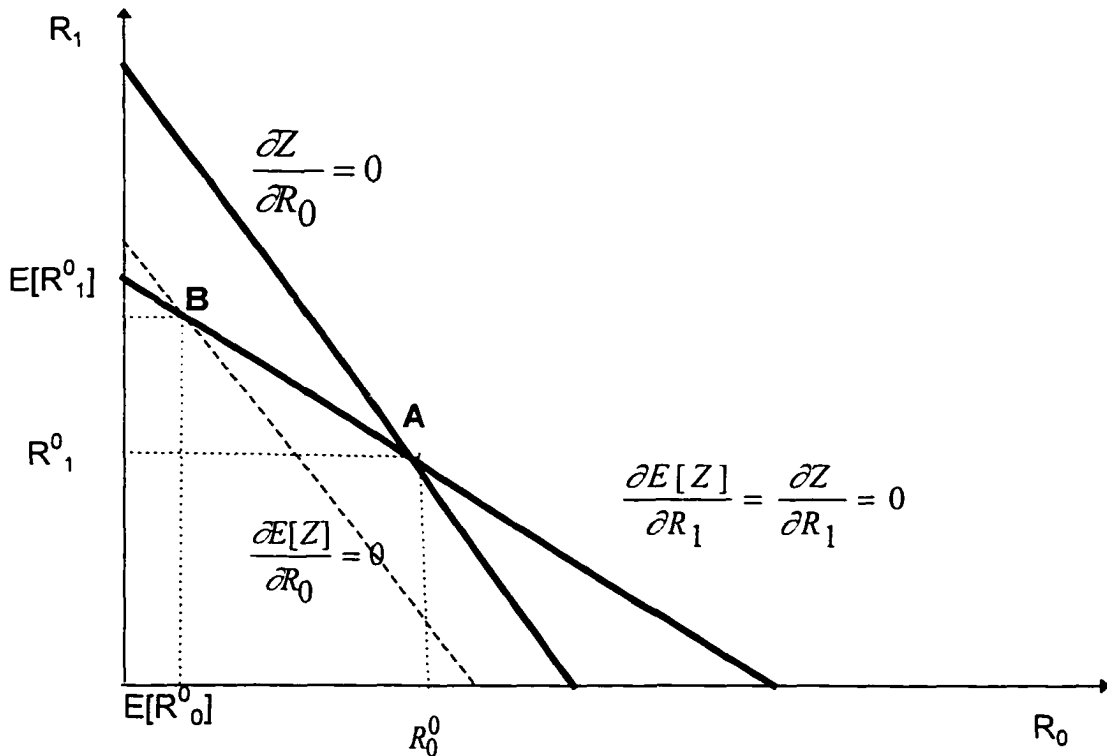


Figure 4. Comparing the pre-commitment solutions with and without risk of political reversal. Case $b_2 < 0$

It is more likely that the governments that are devoted to democracy are more risk averse with respect to the risk of communist coup. Paradoxically, it is possible that governments which are committed to democracy and are further away from the communist ideology will be more reluctant to start the economic reform.

2.9. Some Implications to the Role of International Financial

Institutions in Promoting Economic Reforms

Suppose that one of the transition economies does not make any attempt to start economic reform. Given the assumption of our model there could be two reasons for not attempting to start the economic reform.

First, the government can rationally believe that the downfall of production in the first period of reform will be so dramatic that the communist coup will be almost unavoidable. Thus, the government will be better off if it chooses the reform effort at $t=0$ to be equal to zero.

Second, the government can believe within the time span between the two elections, that the expected level of GNP will not exceed the pre-reform level and, therefore, the correct government will lose the support of the majority of voters. Third, it could be both, either the reform could be considered too risky and too costly in the short-run.

What could be the role of the international financial and development institutions in helping transition economies to start, continue and succeed in economic reform under

these extreme circumstances? It depends on the reason for choosing zero reform effort at $t=0$.

First assume that the risk of political reversal, which is caused by a severe decline in the country's GNP, is the reason for zero reform effort. In this instance the target of the IFIs is clear: to reduce the negative consequences of this temporary downfall in output that may trigger the communist coup. This indeed is the standard justification for the World Bank's and IMF's "structural adjustment" lending as well as for official bilateral credits and aid.

Some authors argue that the government committed to reform is needed before aid can do any good (Sachs, 1994). However, assuming that the expected GNP in the end of the second period is higher than the pre-reform level and that the total value of foreign aid does not exceed the value of the reform net benefits, our model guarantees that the aid will be used to reduce the risk of political reversal and will not effect the intensity of reform efforts regardless of the level of government commitment to the reform. It is more likely that the total reform effort will be higher with the aid than without it. Of course, if the aid is excessive, and its level exceeds the expected level of net reform benefits, external support has a tendency to reduce the government's willingness to start the economic reform and promotes irresponsible policies (Ranis and Mahmood, 1992).

If the reform is not considered to be politically too risky, but just to be too costly in the short-run, the government will be interested in undertaking the reform only if the IFIs provide the government with adequate incentives of equal or larger size than the expected

short-term losses associated with the reform. Under the no-commitment assumption and an unsatisfactory low short-term returns on reform efforts, conditionality and the sequencing of aid and credits flow into the country become a critical issue.

This is well recognized, and both the IMF and the World Bank make access to their resources conditional on the government following a reform agenda.

Another interesting question is: what would be the best policy for the IMF, the World Bank, and the transition government to follow to reach a pre-commitment level of reform effort which is welfare improving? One of the possible solutions is presented in the sections to follow.

3. ECONOMIC REFORM IN EASTERN EUROPE AND THE FORMER SOVIET UNION COUNTRIES AND THE INTERNATIONAL FINANCIAL INSTITUTIONS (IFIs)

3.1. An Overview of the Recent Development in Transition Economies

3.1.1. Economic Reform, Investment and Growth in Transition Economies

There are several very serious claims we made in the previous chapter that require empirical support. First, we claimed that every reform is associated with an immediate decline in the output. This claim is easily verified. Table 2 shows that all of the transition

Table 2. Real GNP in Eastern Europe, 1990-1995

	Average annual growth rate (%)						Index
	1990	1991	1992	1993	1994	1995	1989=100 1995
Czech Rep.	-1.2	-14.2	-6.4	-0.9	2.6	5.2	84.8
Hungary	-3.5	-11.9	-3.0	-0.8	2.9	2.0	85.9
Poland	-11.5	-7.0	2.6	3.8	5.2	7.0	98.6
Slovak Rep.	-2.5	-14.5	-6.5	-3.7	4.9	7.4	84.6
Slovenia	-4.7	-8.1	-5.4	1.3	5.3	4.0	91.9
Bulgaria	-9.1	-11.7	-7.3	-2.4	1.4	2.5	75.6
Romania	-5.6	-12.9	-8.7	1.4	4.0	6.9	84.6
Russia	-3.0	-5.0	-14.5	-8.7	-12.6	-4.0	60.3
Ukraine	-2.6	-11.6	-13.7	-14.7	-23.0	-11.8	43.3

Source: Peter Havlik, "Stabilization and Prospects for Sustainable Growth in the Transition Economies", p. 26, in *Economics of Transition*, ed. by Mark Knell, De Montfort University, Leicester, UK, 1996

economies experienced a significant decline in the GNP levels immediately after they started the economic reform. It can be observed that the Czech Republic, Hungary, Poland, Slovak Republic, and Slovenia have been showing encouraging signs of recovery since the 1993. Bulgaria and Romania are relatively less advanced, struggling either with political instability or lack of support for reform. Lastly, Russia and Ukraine experienced a much deeper economic downfall without any sign of economic recovery by 1995. By 1997, the Russian economy showed some signs of economic recovery: inflation has been reduced to a single digit, consumption and production have stabilized with some good prospects to grow in 1998. On the other hand, Ukraine continues to slide down to extraordinary low levels of economic activity. We also claimed that the "old" sectors of the economy have suffered the most during the transition. Given that all transition economies were "over-industrialized" a faster decline of industrial production relative to GNP can be a good indicator of the validity of this claim. It is easy to see that the industrial production fell much faster than the GNP in all countries (except Ukraine). If the average bottom of the GNP decline was at 72.3%, the average bottom of the industrial production decline was at only 59.0% relative to the 1989, i.e., the industrial production fell by 13% more on average than GNP. There are many reasons and possible explanations of why industrial production fell faster than GNP. In our opinion, the industrial sector in these countries economies was the most "system specific" with very low ability to adjust to the systemic changes. The industrial sector could normally perform only under the well-defined rules of a command economy. As soon as the first elements of the new system were introduced,

Table 3. Industrial Production in Eastern Europe, 1990-1995

	Average annual growth rate (%)						Index
	1990	1991	1992	1993	1994	1995	1989 = 100 1995
Czech Rep.	-3.3	-24.4	-7.9	-5.3	2.1	9.5	71.3
Hungary	-10.2	-16.6	-9.7	4.0	9.6	7.0	82.4
Poland	-24.2	-8.0	2.8	6.4	12.1	9.4	93.5
Slovak Rep.	-4.0	-19.4	-9.0	-3.8	4.9	8.3	76.9
Slovenia	-10.5	-12.4	-13.2	-2.8	6.4	2.0	71.7
Bulgaria	-16.7	-22.2	-15.9	-10.3	8.5	4.6	55.5
Romania	-19.0	-22.8	-21.9	1.3	3.3	9.4	55.9
Russia	-0.1	-8.0	-18.0	-14.1	-20.9	-10.1	46.5
Ukraine	-0.1	-4.8	-6.4	-8.0	-27.3	-11.5	51.6

Source: National statistics

the industry immediately started to collapse without any sign of possible recovery.

In Table 3 we present some data on industrial production dynamics. One of the basic assumptions of our model in the previous chapter was that the inflow of private investment into the transition economy is a crucial element of fast recovery from the economic downfall caused by the initial reform efforts.

Table 4. Real Gross Fixed Investments in Eastern Europe, 1990-1995

	Average annual growth rate (%)						Index
	1990	1991	1992	1993	1994	1995	1989=100 1995
Czech Rep.	6.5	-32.5	16.6	8.0	16.9	15.7	105.9
Hungary	-9.6	-12.1	-1.5	2.5	12.3	0.0	90.1
Poland	-10.1	-4.1	0.4	2.3	8.2	18.6	95.8
Slovak Rep.	-4.0	-27.3	9.2	13.1	2.1	9.2	96.1
Slovenia	...	-14.8	-14.9	15.0	18.3	15.5	89.8
Bulgaria	-18.5	-19.9	13.7	-24.5	-11.9	...	49.4
Romania	-38.3	-25.8	-1.1	8.4	26.4	10.5	62.1
Russia	0.1	-15.5	-39.7	-11.6	-24.0	-13.1	34.3
Ukraine	1.9	-7.1	-36.9	-10.3	-23.0	-35.0	41.2

Source: National statistics

The data in Table 4 suggests that the Czech Republic, Poland, Slovak Republic, and Romania, where the inflow of investments immediately followed the first government's reform efforts, have recovered faster from the downfall, relative to Bulgaria, Russia, and Ukraine, where investment flow continued to be negative.

Table 5. Foreign Direct Investment in Eastern Europe, in million dollars, 1993-1995

	1993	1994	1995
Czech Republic	2153	3191	5917
Hungary	5576	7087	11919
Poland	979	1521	...
Slovak Republic	323	531	728
Slovenia	294	378	528
Bulgaria	141	247	...
Romania	211	552	970
Russia	2858	3496	4637

Source: National statistics

The data in Table 5 suggest that the inflow of investments is very sensitive to the prospects of the economic reform. In the first five countries, where governments were committed to the economic reform, the investment flow became positive within two or three years after the reform began. In Czech Republic, Slovak Republic and Romania, for example, the level of FDIs has tripled during the period from 1993 to 1995. On the other hand, in the countries with questionable commitment to the economic reform (e.g., Ukraine) or in the countries with uncertain prospects of the reform oriented governments (e.g., Russia) the flow of domestic investment continued to be negative even after the fifth year of transition. The inflow of FDI was also minimal relative to the size of the Russian economy. By the end of 1995 the total level of FDI in Russia, for example was lower than in Czech Republic and Hungary.

3.2. Economic Reform, Foreign Investments and the Role of IFIs in Russia

3.2.1. Overview of Recent Development in Economic Reform in Russia

In January 1992, the reform-oriented government led by Gaudar launched its radical “big bang” type reform program. It has caused an immediate and dramatic decline in the country’s industrial, agricultural production and investments, which is line with our model predictions. By the end of 1995 the downfall reached its bottom.

Table 6. Russia’s Economic Performance, 1992-1995, in % to 1989

	1989	1992	1994	1995
Industrial Production	100	74.5	47.0	43.2
Agricultural Production	100	84.6	75.0	72.2
Investments	100	46.5	32.0	27.2

Source: “Voprosy Ekonomiki”, 1996, 3, p.77

According to Russian Government estimates, in 1995 seasonally adjusted industrial production was close to a stabilization trend. There was also an evident reduction in the inflation rate from 17% to a 3.2% on a monthly basis and stabilization of the exchange rate. However, the Russian economy has failed to overcome a deep investment crisis. By several estimates, in 1995 the investment volume was more than 70% lower than in 1989.

The share of investment in GDP continued to decline: from 22.4% in 1990 to 17.3% in 1994 and 15.1% in 1995 ("Vestnik Ekonomiki", The Ministry of Economy of RF, #3-4, 1996, p.31.). During the transition, the government made several serious legislative attempts to encourage domestic and foreign firms to invest in Russia. However, almost all of them failed to change the situation for the better. The traditional argument that used to explain why the government attempts to encourage investments does not produce any positive result was that the economic environment was not transparent and very hard to operate in. Indeed, the economic environment in Russia is hostile but the rewards are also high. It is hard to believe that the economic environment in Czech Republic or in Slovak Republic in the second year of economic transition was different from that in Russia in 1992. However, in Czech Republic investments grew by 16.6% in 1991-92, whereas in Russia, investments fell by 36.6%. In our opinion, the reason for investment to flow in one country and stay out of other, is the uncertainty about the overall progress and sustainability of the economic reform, rather than the lack of transparency. In the minds of foreign and domestic investors in Poland, Hungary, Slovak and Czech Republics there were no doubts that these countries would go all the way in economic reform. Thus, investors were trying to be very early in these markets, even before all pieces of the reform puzzle were in place. In contrast, in Russia, where the reform oriented Government was showing very solid reform orientation and actually made substantial progress in transition to the market based system, foreign firms were slow to respond. The answer is simple: investors still did not believe that this was for real.

3.2.2. Economic Reform and the IFIs in Russia

The World Bank's relations with Russia date back to the founding of the Bank and the IMF at Bretton Woods in July 1944. However, the Soviet Government did not ratify the agreement and did not become a member of these international financial institutions. Only with the political changes of the late 1980s did the Soviet leadership start to express interest in building links with the World Bank and the IMF.

The G-7 Summit held in London in 1991, called for associated membership for the Soviet Union in international institutions. In July 1991, the Soviet Union applied for membership in the IMF and the World Bank Group. On August 27, 1991, the World Bank approved the establishment of a special trust fund of US\$30 million for technical cooperation to assist the country's economic reforms. Following the collapse of the Soviet Union, the Government of the Russian Federation applied for membership in the IMF and the World Bank Group on January 7, 1992. The Russian Federation joined these institutions on June 16, 1992. Today, the Bank is Russia's largest foreign source of long-term financing for public sector investments. In addition, it provides important financing for the private sector through financial intermediaries and other institutions. So far, it has approved 28 loans to Russia totaling more than US\$6.4 billion. In the last fiscal year, Russia was the Bank's third largest borrower after China and India.

The World Bank's sister organization, the International Finance Corporation (IFC), is a leading direct investor in Russian businesses. In addition to its advisory work, the IFC

has been actively pursuing investment opportunities since the Russian Federation joined the Corporation in March 1993. As of July 1996, IFC has approved US\$368 million for 20 projects, including post-privatization restructuring, capital markets, agribusiness, and oil and gas investments.

Of the World Bank's 180 current members, Russia is one of the World Bank's major shareholders. Moreover, the Russian Federation is a significant contributor of funds to the Bank's affiliate organization, the International Development Association (IDA) which is in charge of assisting the poorest countries of the world on highly concessional terms.

Russia's investment needs are greater than the combined resources of the Government and international financial institutions. Therefore, Russia will have to extensively rely on both domestic and foreign capital markets to finance the bulk of its massive restructuring needs. The World Bank lending and technical assistance serve as catalysts for fiscal, legal and institutional reforms which will facilitate new private investment and make public investments more efficient.

The World Bank Group is helping Russia make the transition to market financing as rapidly as possible by:

- expanding the role of the private sector through support of ownership change in state-owned enterprises and assisting emerging new private businesses;
- strengthening public sector institutions supportive of a market economy through legal, institutional and fiscal reforms; and

- facilitating private investment through sectoral reform programs (IBRD sector and investment lending), mobilizing foreign financing for key private sector projects (IFC investment lending), and ensuring a stable and transparent environment for foreign investment (Multilateral Investment Guarantee Agency (MIGA) and IBRD guarantee programs).

In addition to financial resources, the Bank's projects provide access to training and technology transfer opportunities that facilitate reform efforts. These projects are intended to demonstrate in selected businesses, sectors, regions, and levels of government how processes, incentives, and, above all, institutions must change for a fully functioning market economy. These changes will enable Russia to mobilize the massive private financing needed to restructure industry, boost economic activity and raise living standards.

In August 1992, the first World Bank loan was issued to Russia. It was a US\$600 million economic rehabilitation loan to support the Russian Government's first phase of reforms. Including the second US\$600 million economic rehabilitation loan, approved in June 1995, the World Bank has provided US\$1.2 billion in fast-disbursing assistance to support Russia's economic stabilization and reform program including price and trade liberalization, mass privatization, and oil sector development. Together with support from the International Monetary Fund (IMF), these operations are helping to stabilize the economy, which is a critical precondition for increased domestic and foreign investment.

Because of its importance in the Russian economy, energy sector investment has constituted a major part of Russia's borrowing program from the World Bank. During the

past three years, progress in petroleum sector policy reforms has been considerable with support from the World Bank's oil rehabilitation loans. In June 1993, the first oil rehabilitation loan provided US\$610 million to slow the rapid decline of Russia's oil production. It was the largest project loan approved for any country in the Bank's 50-year history. This loan was followed by a similar operation of US\$500 million; the second oil rehabilitation loan was approved in June 1994. Both projects have been designed to restore oil production, which generates crucial revenue for the country's transition and attracts foreign investment.

With Russia's energy use per unit of GDP more than four times that of OECD countries, gains in energy efficiency can provide very high economic and financial returns. The World Bank is financing investment in energy efficiency through a US\$106 million loan approved in May 1995 for an energy efficiency project.

The Government is making efforts to restructure the transport sector, develop appropriate policies and a legal framework, and privatize and demonopolize transport. The World Bank contributed to these efforts with a transport strategy report. By July 1996, three loans totaling nearly US\$1 billion were approved: a US\$300 million highway rehabilitation and maintenance loan to finance 1,500 km of road rehabilitation and reform road sector institutions and financing; a US\$329 million urban transport loan to help restore bus service in 14 cities and help municipal transport authorities operate on a commercial basis; and a US\$350 million bridge rehabilitation loan to rehabilitate about 300 bridges in urgent need of repair.

Russia's mass privatization program has been the largest ever undertaken in the world. In 1993, the Bank supported the Government's efforts through policy advice and a US\$90 million loan for a privatization implementation assistance project. In 1994, the World Bank initiated its support of financially stronger enterprises through development of a sounder banking system with its approval of a US\$200 million loan for a financial institutions development project, and a US\$200 million loan for an enterprise support project. In May 1996, the Bank approved a US\$89 million loan supporting the development of capital markets and the strengthening of market incentives for improved corporate governance. Also in the same month, the Bank approved a US\$300 million loan that will promote the divestiture of housing assets from enterprise to private management by assisting local governments to make energy efficiency investments in divested housing.

In the World Bank's continued efforts to support market incentives, in 1994, two loans totaling US\$320 million were approved to support agricultural and land reform. The projects are helping to establish the foundations for private agriculture based on market principles.

The World Bank has also continued to encourage Russia to define a new role for its public sector in supporting the market economy. In 1995, the World Bank approved a US\$16.8 million loan to assist the modernization of the tax administration system and a US\$40 million loan for a portfolio development project that will help the Government strengthen its resource management and project preparation and implementation capabilities. Also, in order to assist Russia's accession to the World Trade Organization

(WTO), the World Bank approved a US\$24 million loan in November 1995 to ensure that Russian product and process standards are compatible with international standards required by the WTO. In June 1996, the Bank also approved a loan of US\$58 million to support improvements in the legal system, particularly in areas which are crucial to the functioning of a market economy.

Other than the fast-disbursing first and second rehabilitation loans, the disbursement of the World Bank's current loan portfolio has been relatively slow. Behind the delays are a host of start-up problems typical of a new borrower. During the February 1996 Country Portfolio Performance Review in Moscow, the Government and the World Bank identified priority areas which need to be addressed in order to accelerate project implementation. Specific benchmarks and performance deadlines were agreed on with regard to the 18 Bank-supported projects that were active at the time.

3.2.3. Russian Government Political Risk Program: an Attempt to Create a Pre-Commitment Mechanism

Until now we assumed that foreign firms were in full knowledge of what type of government they were dealing with when they made an investment decision. Thus, it was just a matter of deriving of perfect foresight solutions for the reform efforts and for the capital invested.

Suppose now that the pre-commitment model represents the optimal reform sequence of the government committed to the economic reform ("good" government), and the time consistent model represents the optimal reform sequence of a selfish government

("bad" government). As we have already shown, foreign investors will invest more if they know that they are dealing with the "good" government relative to the case when they know that the "bad" government is in power. However, if there is uncertainty about the government type, and also if it is too costly for the "good" government to signal its quality, foreign firms will be forced to put equal weight on each of the two possibilities. It means, that the resulting level of investments will be somewhere in between the two full information levels of investments. One way to deal with this problem is to link the investments flow to some system of conditions that have to be followed by the government.

To address the above issue, the World Bank team, with which I have been associated for the last two years, has developed a so called Political Risk Guarantee Program for Russia (PRGPR). The basic idea was simple: if the Government of Russia (GOR) is committed to the reform, it would be willing to guarantee to the government or other non-commercial forces would interfere in the commercial transaction between the foreign firm and its commercial counterpart in Russia. The rejection of the proposal to establish a Guarantee Facility would mean that the GOR's reform policy is likely to be changed in the future. There are several questions that had to be answered during the Program design stage. First, what kind of risks have to be covered by the guarantee? Second, who should be the issuer of the Guarantee and who should pay the claims if they arise? Third, who and how many of the Guarantee coverage to offer? How long should the Program last? Fourth, what should be the structure of the Guarantee premium?

In the paragraphs below we describe the structure of the Guarantee Program as it has been presented to the World Bank Board of Directors with some comments that focus on the along the way. It has been agreed that the Political Risk Guarantee Facility will compensate guarantee holders for losses that occur as a direct result of the following risks which are sustained during the effective coverage period as specified in the guarantee agreement.

- ***Inconvertibility or Inability to Transfer.*** This includes coverage for losses arising from the introduction by the Government of any restrictions on the conversion of local currency into foreign exchange or the transfer of foreign exchange out of Russia. Coverage protects lenders against active or passive restrictions, where active restrictions include such items as a decision by the Government or the Central Bank denying conversion or transfer, and passive restrictions including the failure of the GOR or the Central Bank to authorize a legal exchange or transfer to take place (in the event such prior authorization is required). This coverage also includes protection against the GOR's failure to permit the conversion of local currency into foreign exchange at the market rate of exchange. However, this coverage does not grant the guarantee holder the right to convert local currency into foreign exchange at a guaranteed future exchange rate.

- ***Cancellation of Licenses and Restrictions on Import and Export.*** This includes coverage for losses arising from the cancellation or non-renewal of an import or export license by the GOR or the imposition by the GOR of restrictions on the import into Russia

of capital or the export from Russia of outputs which were not previously subject to restriction.

- ***Imposition or Increase of Import or Export Taxes.*** This includes losses arising from the imposition by the GOR of any new or increased import or export tax levy or duty relating to the import of capital or the export of outputs.

- ***Seizure of Goods or Prevention of Sale.*** This includes losses arising from the taking and holding the assets by the GOR without just, prompt and adequate compensation.

- ***Interference with Activities of the Firms that Provide Services to the Transaction Covered under the Guarantee Program.*** This includes interference with contracts between local banks, public utilities, storages, ports, rails and highways and other facilities that provide support to the commercial transaction, preventing them from receiving, handling, storing, loading, transporting, and shipping goods covered by a contract signed by the foreign firm and its Russian counterpart.

- ***Cancellation or changes of products registration.***

Political Force Majeure.¹³ This includes coverage against losses arising from military action or civil disturbances in Russia. Other types of *force majeure* - e.g., flood, drought, other natural disasters, war in neighboring transit countries - would not be covered.

¹³ It can be seen that all of the above risks are under full government control, except for ***Political Force Majeure***. For that single reason the idea of including ***Political Force Majeure*** in the list of covered risks met significant resistance of the Russian Government. Clearly, the Government did not want to guarantee the coverage against the events it could not fully control.

It has been agreed on that because the GOR is in full or at least partial control of all covered risks it has to be a key underwriter of the Guarantee and the World Bank will provide a secondary line of support in case the GOR fails to pay the outstanding claims.¹⁴

The Guarantee will be available to all approved foreign suppliers of capital, who are willing to supply capital to Russian productive sectors on credit with deferred payment via letters of credit, cash from sale of production or payment-in-kind. The Guarantee Administrative Unit (GAU) will accept guarantee applications against governmental interference and political *force majeure* risks for all sectors of the Russian Federation. The maximum amount of guarantee policies which will be outstanding at any point in the program will be US\$1 billion.

The Ministry of Finance (MOF) will require indemnification by the oblast level or sub-national governments for their participation in the program. This is to place the MOF in position to hold the sub-national governments which cause the claim responsible for their actions.

¹⁴ Two main risks have been identified with respect to the proposed facility. First, the reversal of the stabilization and structural reform programs currently being implemented by the Government of Russia (GOR) could lead to a large volume of claim payments, potentially creating a future large debt repayment obligation by the GOR to the Bank. This can be mitigated by covering only those risks which are fully under the jurisdiction of the GOR. To further reduce this risk, the Bank will reserve the right to suspend the GAU's authorization to issue new guarantees backed by the Bank's resources. Second, the facility does not generate increased private sources of credit financing, based on payment-in-kind terms. This risk can be minimized by designing the facility on the basis of well-established market principles, making certain that each transaction guaranteed by the facility meets rigid tests concerning commercial viability.

4. POTENTIAL APPLICATIONS OF THE MODEL, SOME CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The model analyzed in this paper and the results derived from it can be used to try to shed light on some aspects of economic reform such as:

- a comprehensive nature of economic reform;
- speed of the reform;
- complementary or substitutability of different reform efforts;
- credibility of reform, foreign firms and economic reform.

An important feature of the model is that it recognizes the fact that the reform effort is a choice variable that depends on a variety of behavioral and technological assumptions about:

- the agents' (government and private sector) agendas during the transition period;
- the effects the economic reform has on traditional and internationally standard production technologies;
- the costs of different reform efforts;
- the sequence of decision and moves of different agents in the model.

The model recognizes the fact that economic reform is just one of the alternatives that can be explored by the government in reaching its goal(s). The model allows as to show that besides the traditional reasons that effect the speed and intensity of economic reform efforts, the sequence and timing of decisions is critical to the outcomes of the reform. We showed that because private agents correctly anticipate that the government

has the ability to change its previously announced policy, private sector support of the government's reform efforts is much weaker comparing to the case when the government can pre-commit to the future reform efforts. On the other hand, because the government knows that firms know that there is no credible pre-commitment mechanism available to support the announced level of future reform efforts, its actual level of reform efforts decreases relative to what it could be if the pre-commitment mechanism existed.

We also showed that the absence of a pre-commitment mechanism not only effects the speed and intensity of economic reform in the future but can also effect the level of reform activity during the initial stages of economic reform. For example, we showed that if there is no pre-commitment mechanism it is possible that the government could be interested in increasing the level of reform efforts during the initial stages of reform. This not only may increase the overall cost of reform effort but also increase probability of the political reversal, which is of a great concern of all private investors.

We show that a pre-commitment solution is more desirable comparing to the time consistent solution and that a pre-commitment mechanism is required to enhance its credibility. And we proposed such a mechanism that together with other pre-commitment mechanism can be applied in transition economies, especially in the initial stages of the reform.

There are several ways of how this model can be extended. Firstly, it will be interesting to see how the government and private sector behavior changes if we relax some of the assumptions about the labor market. For example, what will be the resulting

equilibrium if we assume that labor is partitioned into skilled and unskilled labor force? Assuming that private firms require higher quality of labor to use with the new technology and are willing to compensate skilled labor at its marginal product level, skilled labor will start moving to the new sectors of the economy. Thus, production in traditional sector of the economy will fall not only because of the direct effect the economic reform has on the efficiency of traditional sectors, but also because the most productive part of the labor force will leave the traditional sector. Also, if we assume that skilled labor is a complement to the unskilled labor, the fact that skilled labor is leaving the traditional sectors will depress unskilled labor wages, which in turn can reduce the popularity of the economic reform.

Secondly, the information asymmetry about the government type may be another interesting extension of our model. Until now we assumed that foreign firms are in full knowledge of what type of government they are dealing with when they make an investment decision. We also assumed that the government in power knows that the firms know what type of government it belongs to. Thus, it was just a matter of deriving of perfect foresight solutions for the reform efforts in period one and two and for the capital invested.

However, in reality it is not so easy for the firms to determine what type of government they are dealing with. It is relatively easy to mistake selfish governments for the governments that are fully committed to the reform. On the other hand, the governments that are committed to the reform and do not have intentions to deviate from

the announced reform path can be mistaken for selfish governments. We can suppose, for example, that the pre-commitment model represents the optimal reform sequence of the government committed to the economic reform, and the time consistent model represents the optimal reform sequence of a selfish government.

And lastly, an empirical testing of the model may throw some additional light on the process of economic reform in transition economies.

APPENDIX

RUSSIAN GOVERNMENT POLITICAL RISK GUARANTEE

PROGRAM

I. Introduction and Background

Since the breakup of the former Soviet Union (FSU), Russian production across all sectors has fallen due to a lack of short-term working capital financing and medium-term financing for equipment, machinery, and technology. This lack of short and medium-term financing has had a detrimental impact on the Russian economy. In particular, food/agricultural production and processing, the extractive industries (oil, gas and minerals), the clothing and textile industries, as well as timber/lumber subsectors have been affected by the lack of working capital. The GOR is undertaking stabilization supported by the International Monetary Fund (IMF) as well as other reforms supported by the World Bank. The GOR's primary objective is to restore production, improve product quality and develop new markets both within the FSU and the international marketplace. A key impediment to this goal has been and continues to be the extreme shortage of working capital, both in the form of direct financing and the availability of inputs. This project was designed to help fill this gap by encouraging input manufacturers, distributors, trading companies and financial institutions to provide financing and/or inputs on credit, with repayment via deferred payment contracts. The result is expected to be a significant increase in commercially viable agricultural and industrial transactions which will help

restore production, and improve product quality and move Russia toward a market oriented economy.

- ***Lack of Working Capital Finance.*** Due to the combination of a rapidly eroding capital base, continuing high inflation, a tight domestic credit policy, and a complicated legal environment and land titling system, Russian commercial banks are unable to meet the demand for short and medium-term working capital loans of Russian enterprises. The situation is especially difficult for agriculture because commercial banks rarely loan to agriculture for new crop production due to the high risks inherent in farming and the absence of satisfactory collateral. This shortage of working capital financing is not expected to improve in the near-term and will accelerate a continuing decline in the economic performance in almost all sectors of the Russian economy. One solution may be to facilitate the supply of working capital finance by a supplementary source of financing - the input manufacturers, distributors, and trading companies that are willing to supply inputs on credit. This project is considered a supplementary source of financing for short-term transactions which is not only expensive but very difficult to obtain in Russia. For most Export Credit Agencies Russia is the highest risk category and exporters pay the highest premiums for coverage.

The US EXIM Bank currently has no short-term cover available for Russia. The position of most other major agencies is somewhat less restrictive than that of the US. However, Japan is not prepared to cover Russian transactions without external guarantees or escrow accounts. This position is not expected to change in the near future. The Dutch

are on cover for letters of credit only, at their highest premium rates. The United Kingdom is on cover for transactions on a case-by-case basis, with a strict ceiling on exposure. The French are very restrictive and prefer to do business based on collateral deposited in overseas escrow accounts.

In summary, OECD countries as a whole are continuing to increase their exports to Russia but ECAs are reducing their Russian exposure. Unless ECAs devise an alternative to the requirement for letters of credit, their business in Russia will continue to decline.

In addition to financial bottlenecks described in this paper, the perceived risk of governmental interference in commercial transactions within Russia inhibits potential suppliers of input credit from dealing more aggressively with Russian customers/producers. In previous dealings with the FSU, input suppliers have experienced cancellation of export contracts, confiscation of input inventories, abrupt changes in product regulations and registration, interference with loading and shipping of goods received as payment-in-kind. Hastily imposed regulations have been established by the GOR which prevented the input suppliers from being paid with production output even though such goods had already been delivered locally to the supplier's account or designee. This poor record and resultant reputation of the GOR continues to severely restrict this potential source of short and medium-term financing.

Another factor inhibiting the flow of commercially viable deferred payment or payment-in-kind transactions is the general perception of war and civil disturbance

(political *force majeure*) in the Russian Federation. This perception is especially significant for Russia in light of recent civil disturbances.

A possible solution. Discussions with a wide range of commercial lenders, input manufacturers, distributors and suppliers, trading company officials, and Russian producers and processors indicate that an effective program to mitigate perceived government interference and political *force majeure* risk would significantly increase the flow of private finance of inputs to all Russian enterprises. The potential catalytic impact of such a program would be especially strong as Russia moves through its economic transition process, when political and economic uncertainty is greatest and the Government's commitment to trade liberalization and private initiative is relatively untested. It is during this period that a favorable enabling environment in the form of business-friendly statutes, rules, and regulations may not be sufficient to assuage the concerns of private lenders. Input suppliers and private lenders are not confident that the new, more liberal rules and regulations will remain in force at least for the life of the underlying input supply transaction.

These non-commercial risks are risks which foreign input manufacturers, suppliers, distributors, trading companies and financial institutions cannot manage or control. All risks covered by the guarantee are entirely separate from normal commercial risks. With the protection provided by the proposed guarantee, companies that are willing to assume commercial risks in the Russian market on payment-in-kind terms would have a key obstacle removed from engaging in transactions with Russian producers and processors.

Since the RPIGF provides coverage for non-commercial risks brought about by either federal or the sub-national government levels, it will be necessary for the participating subnational governments to sign indemnity agreements with the Ministry of Finance (MOF) in which the participating subnational governments will agree with the MOF on the specific terms and conditions under which each sub-national government participates with the MOF in this guarantee facility. It is anticipated that the indemnity agreement will mandate reimbursement to MOF for any claims paid by MOF which were caused by the subnational government's actions or inactions. Dispute resolution between the MOF and the participating sub-national governments will be an important aspect of this agreement. It will be suggested by the mission and legal that any and all arbitration between the MOF and the sub-national government be carried out in a manner satisfactory to both parties. This indemnity agreement between the MOF and the sub-national government also strengthens the guarantee facility since it makes it possible for the World Bank to hold the MOF responsible for all claims regardless of which level of the GOR caused the claim. Moreover, the agreement holds the sub-national government responsible to the MOF for all claims caused at rayon or lower levels of government.

While the commercial risk of deferred payment or payment-in-kind transactions is substantial, at least some foreign commercial banks, and a large number of the world's input manufacturers believe it can be controlled, managed, and limited. For example, input suppliers and trading companies have developed effective credit rating systems for their customers. Others deploy field agents to help ensure that the inputs are used as

intended and that the output is produced, marketed and sold to either domestic or export markets. Additional typical techniques for reducing commercial risk include: (i) providing working capital inputs in exchange for goods that are easily salable on either the local or world markets (e.g., garments, textiles, shoes, food products, feed grains and oilseeds, manufactured goods such as plastics, electronics, timber and wood products; (ii) working with skilled and experienced local counterparts who know how to overcome the typical commercial obstacles encountered in Russia; (iii) contracting in advance to sell the output received as payment to a creditworthy buyer or merchandiser; (iv) developing subcontracting and tolling arrangements whereby local enterprises process semi-finished goods provided by foreign manufacturers; and (v) working with local enterprises whose management and technical capacity are well known to the trading company or input supplier.

II. Facility Description

A typical deferred payment transaction eligible for support would have the following characteristics:

- ***Basic Structure.*** Privately held Russian enterprises and foreign input manufacturing and supply companies, distributors, commercial banks and trading companies will provide short and medium-term inputs, including cash, to local enterprises across all productive sectors in all areas of the Russian Federation. These inputs will be supplied on credit, with payment being made (i) in cash by the producer after selling the production or (ii) by the delivery of an agreed upon portion of the resulting production

output at a future date or (iii) by use of a letter of credit. The parties to each such transaction will be free to determine their own commercial arrangements without interference of the GOR or the Bank, provided it can be shown that these inputs will be used exclusively for the production of crops, products and goods. No input goods covered under the RPIGF will be eligible for re-export or commercial trading within or outside the Russian Federation. The supplier of such inputs will, however, have the right to retrieve and re-export any goods or materials supplied by them in the event their Russian customer has not met the commercial terms of their agreement. The coverage will be transaction specific. That is, the supplier of goods to Russian producers must present the GAU with documentary evidence of both ends (sales and deferred payment) of the transaction: (i) signed sales agreement where by the sale of inputs has been made to a bona fide Russian buyer; (ii) the deferred payment contract must also be presented which indicates the method of payment: cash after the production is sold, goods-in-kind, including amount of goods, value, delivery date and terms, quality specifications and designated delivery point, letter of credit, etc. All terms of the transaction will be registered by the GAU at the time the coverage is applied for and purchased. The commercial risk of each transaction will be the sole responsibility of the parties entering into the agreement.

- If the GAU has questions to the validity of either end of this transaction or the parties to the transaction, pricing of goods, etc. it will (i) require additional documentation and information from the parties or (ii) have its field staff or designated representative

verify the transaction via field inspection. Any suppliers or buyers which refuse access to the GAU inspection staff will be denied coverage.

- ***Guarantee Eligibility.*** Local privately held commercial enterprises and foreign manufacturers, suppliers, distributors, trading companies or commercial banks that provide goods, services or financing to agricultural producers, processors and manufacturing facilities in any sector of the Russian Federation on deferred payment contracts will be eligible for RPIGF coverage. The suppliers must be willing and able to finance the transaction for the term of the contract and be prepared to bear the performance and credit risks of doing business with the Russian buyer. If the input supplier has entered into a payment-in-kind agreement, the input supplier must also have the ability to work with payment-in-kind contracts and the monetization of goods paid-in-kind or provides satisfactory evidence that this responsibility has been assigned to a competent third party.

- ***Tenor.*** The tenor of transactions would be designed to match the typical production cycle of the manufacturer or agricultural entity. In some industries such as agriculture, this term will be for 350 days or less. In the case of machinery, equipment and technology, a longer period may be required for repayment out of production. Since the term of the project is 6 years, the maximum medium-term transaction will be up to 6 years, assuming the sale was made early in the beginning year one. These medium-term maturities are particularly important for the agro and other processing sectors which require new machinery, equipment and technology in order to produce goods for which there will be substantial demand either in Russia or in export markets. It will be the

responsibility of the suppliers of inputs to work out appropriate repayment schedules or deliveries of goods-in-kind for medium-term guarantees including logistical and marketing requirements for goods that will be delivered to the account of the input supplier or its designee.

- ***Eligibility to Purchase Guarantee Coverage.*** Guarantee applications will be received on a first-come, first-served basis. Guarantee coverage will be provided, however, only to applications which undergo rigorous evaluation (per eligibility criteria which will be developed during the mission) by the GAU. The MOF will have the final approval of each application and each approved application must bear the stamp of the designated ministry official. Eligible purchasers of the coverage may include commercial lenders, input manufacturers, distributors and trading companies or any other entity which takes credit risk in supplying inputs. Purchase of the RPIGF guarantee will be entirely optional, as parties to each transaction will be free to decide whether or not protection provided under the program is needed for their individual situation.

- ***Guarantee Premiums.*** A total premium of 400 basis points, (100 basis points guarantee fee and 300 basis points for GAU administration) per annum will be charged prorated on a quarterly basis. All premiums will be collected by the GAU in a lump-sum via verified funds at the time the guarantee coverage is approved by the GAU. All local and foreign purchasers of coverage will pay the guarantee premium in US dollars. Said premiums will be deposited into an account maintained by the GAU at the Agent Bank from which operating expenses, the World Bank guarantee fees, Agent Bank charges and

the repayment of the Portfolio Loan will be made. During the first year, the 300 basis points portion of the guarantee premium charged by the GAU will be reviewed on a quarterly basis in consultation with the Bank, taking into account the relative demand for coverage. After the first year, the guarantee 300 basis points portion of the premium charged by the GAU will be reviewed semi-annually in consultation with the Bank. Agreement on initial premium structure and procedures for period review was reached during negotiations.

- ***Risk Distribution.*** Each party to a transaction covered under an RPIGF guarantee will be expected to cover all commercial risks pertinent thereto, and would include: (i) failure of the Russian input buyer to deliver the specified quantity and/or quality of output goods agreed to in the contract; (ii) a decline in the world market price of the products received by the input supplier as payment-in-kind; (iii) an increase in the price of other inputs needed for production of the payment-in-kind output; (iv) exchange rate fluctuation; and (v) the failure or inability of the intended buyer of the output to honor its purchase obligations, either for commercial reasons or due to the occurrence of political interference outside Russia. The Master Guarantee Contract (MGC) will cover only those losses that are the direct result of GOR actions or inaction or political *force majeure*. If only federal coverage is purchased per the split guarantee option, the guarantee holder will be protected against interference caused by the Federal Government of Russia.

In all cases, it will be the GAU's responsibility to make a final decision that government interference or political *force majeure* has occurred with respect to any claim which may have arisen and establish the amount of the claim allowed under the guarantee.

In order to prevent one or two guarantee purchasers from monopolizing the available coverage under the RPIGF, the maximum amount of guarantees that could be outstanding at any one time to support transactions involving the participation of one input/MTR supplier will be limited to a ceiling of US\$25 million. Any request for a waiver of this condition will be submitted to the Supervisory Board of the GAU and will only be granted with specific approval of the World Bank. In order to enable small firms to participate under the program, a minimum transaction purchase of US\$100,000 will be allowed.

III. World Bank Guarantee Facility

A World Bank Guarantee Facility will backstop guarantees issued by the GAU on behalf of the GOR, up to a maximum amount of US\$1 billion outstanding at any one time. Under the terms of the guarantee, there will be no flow of funds from the World Bank unless a valid claim is refused payment by the MOF, and the World Bank guarantee is called upon by the Agent Bank. In the event disbursement from the World Bank guarantee facility is made, the amount of headroom remaining under the RPIGF program will be reduced by the amount of such claim unless and until the MOF reimburses the World Bank per the terms of the guarantee agreement. The World Bank would only provide funds under

the guarantee to the Agent Bank if the GOR failed to remit payment upon demand by the Agent Bank for payment of a valid claim.

The GOR will sign a MGC with the World Bank which will delegate withdrawal authority to the GAU, which in turn will assign drawing rights to the Agent Bank. The Agent Bank will have the irrevocable right to draw upon the facility to pay claims for which funds are not received from the MOF within the prescribed payment period of 10 working days.

In the event the World Bank's guarantee is drawn upon by the Agent Bank, immediate demand will be made by the World Bank upon the MOF to repay the full amount of funds drawn under this guarantee. Should payment not be made to the World Bank within 72 hours of this demand, such non-payment will result in default by the GOR to the World Bank Group.

Should any default by the GOR in payment of valid claims occur under the MGC, the World Bank will retain the right to suspend commitments for new RPIGF guarantees to be issued by the GAU. Such defaults would include: (i) payment by the World Bank under its guarantee to the Agent Bank which are not reimbursed by the MOF within 72 hours; (ii) non repayment by the GOR of draws made by the Agent Bank against the World Bank guarantee facility ; (iii) the GAU not being administered in accordance with the terms of the MGC; or (iv) substantial reversal of the existing trade and foreign exchange regime of the GOR, even if the changes do not result in outstanding guarantees being called. However, no suspension would affect the World Bank's obligation to pay the

Agent Bank for approved guarantee policies already in effect and for which standby letters of credit have been issued prior to the date of suspension.

- ***Availability Period.*** The World Bank Russian Production Input/MTR Guarantee facility would be available for backstopping new guarantees for a period of 6 years, thereby potentially enabling the GAU to support US\$1.8 billion of deferred payment transactions, assuming that the average tenor of each transaction is one year and the GAU's guarantee issuance capacity is fully utilized. As Russia develops a more creditworthy reputation in the international short and medium-term finance market, it is anticipated that the commercial banks will eventually take over this financing responsibility as the RPIGF comes to an end. A 6-year availability period would also enable input/MTR suppliers, trading companies, and private financiers to amortize the costs of developing commercial relationships in the Russian marketplace over an attractive period of time.

Price of Guarantee Facility to the GOR. The bank's share of the guarantee fee will be 25 basis points per year on the total amount of the guarantee coverage of US\$1 billion, or a total of US\$2,500,000 per year. It is anticipated that all costs associated with the RPIGF will be covered by premium revenues generated from the sale of the guarantee coverage.

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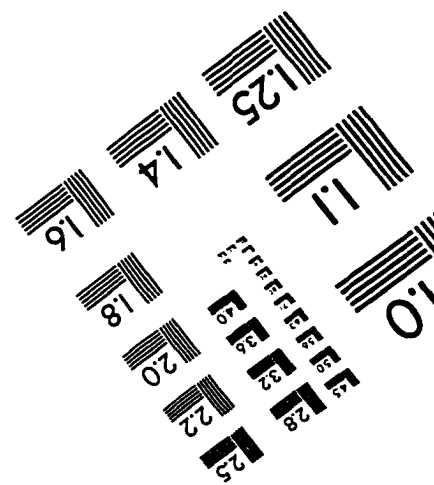
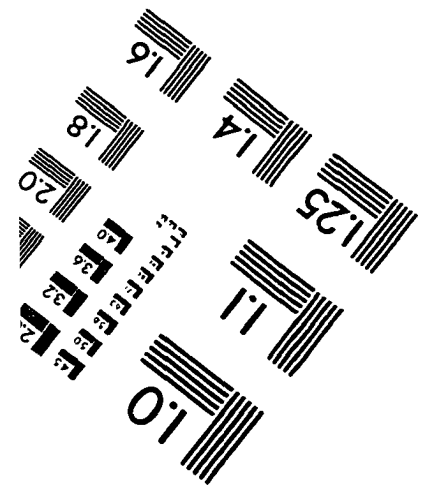
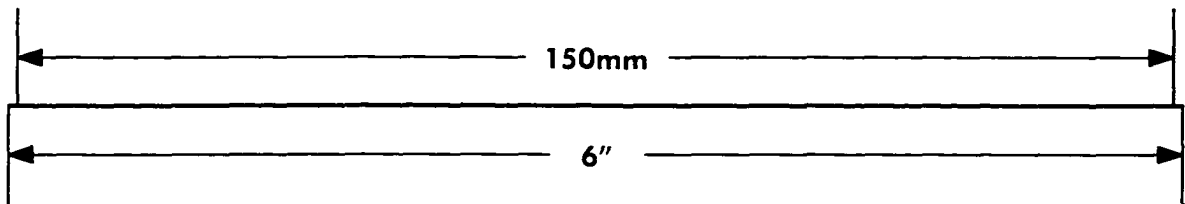
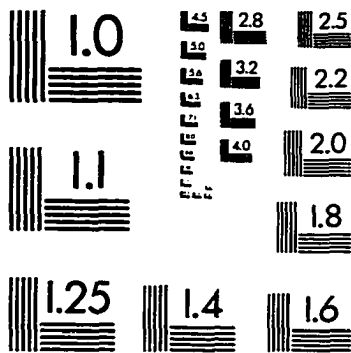
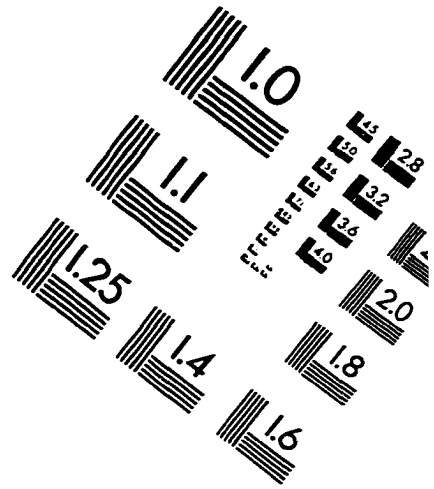
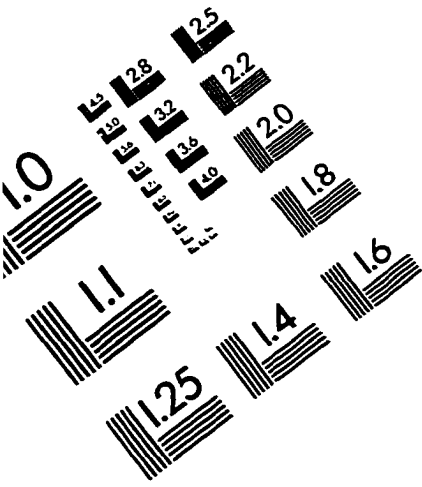
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IMAGE EVALUATION TEST TARGET (QA-3)



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