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Political Feasibility and Investment
in Economic Transformations

Prepared by Joshua Aizenman and Peter Isard

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Abstract

The paper characterizes the feasibility of economic transformation as requiring the simultaneous attainment of macroeconomic stability, political support, and adequate private investment. Macroeconomic stability is defined as fiscal balance; political feasibility is related to the income gains and losses of different population groups; and private investment is linked to public "infrastructure" investment. The analysis illustrates that attainment of the multiple requirements for successful transformation may necessitate a "big push" with external financial and technical assistance. It also emphasizes the importance of the productivity gains achieved when workers are induced to make occupational choices consistent with their comparative advantages.

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Summary

This paper analyzes the challenge of transforming a state-owned and centrally controlled economy into a private, decentralized market economy under initial conditions that tend to place the policies necessary to induce an adequate rate of private investment in conflict with those required to preserve political support for the transformation effort. The initial conditions generally include a state enterprise sector that requires large subsidies to cover production costs, a primitive stock of public "infrastructure" that makes it difficult for private enterprises to operate at a profit, and often an environment of macroeconomic instability (for example, large fiscal deficits) that further discourages private enterprise.

The analysis focuses on the feasibility of simultaneously sustaining macroeconomic stability, political support, and adequate private investment. Macroeconomic stability requires that expenditures on net subsidies to the state production sector, as well as public infrastructure investment, be financed by tax revenues from the private sector and external assistance. Political feasibility is assumed to depend on the income gains and losses experienced by the three population groups identified in the model--state sector workers, private sector workers, and private investors. This formalization captures the notion that the need to maintain domestic political support may constrain short-run reductions in the levels of state sector wages, transfer payments, and subsidies. The labor market is modeled in a manner that emphasizes the importance to the transformation process of the productivity gains unleashed by a competitive environment in which heterogenous workers are induced to make occupational choices consistent with their comparative advantages.

The analysis supports the following policy perspectives. First, attaining adequate private investment requires sufficient public infrastructure as well as the maintenance of macroeconomic stability. Second, political forces may limit the financial resources that governments can raise domestically to finance infrastructure investment without relinquishing macroeconomic stability. Consequently, the achievement of adequate levels of public infrastructure investment and private investment--and hence the feasibility of the transformation--may depend heavily on external assistance in the short run. However, the need for external assistance will diminish over time with the buildup of public infrastructure, the growth of the private sector, and the increasing employment flexibility of new entrants to the workforce.

I. Introduction

The process of transforming a state-owned and centrally-controlled economy into a private decentralized market economy typically starts from initial conditions in which the policies necessary to induce an adequate rate of private investment tend to conflict with the policies required to preserve political support for the transformation effort. The initial conditions generally include a state enterprise sector that requires large subsidies to cover production costs, a primitive stock of public "infrastructure" 1/ that makes it difficult for private enterprises to operate profitably, and often an environment of macroeconomic instability (large fiscal deficits) that further discourages private enterprise. The policies needed to establish an environment conducive to private investment--that is, to achieve and/or maintain macroeconomic stability, while simultaneously undertaking adequate investments in public infrastructure--generally call for reductions in subsidies and the imposition of wage austerity, which tends to undermine political support.

This paper develops an analytic framework that illustrates how the requirements for political feasibility and adequate private investment jointly interact with the level of external assistance in determining whether a successful transformation is feasible. The analysis concentrates on exploring the feasibility of the transformation for the case in which private savers and investors base their ex ante decisions on the assumption of macroeconomic stability. This approach reflects the premise that adequate private savings and investment would not be forthcoming where the assumption of macroeconomic stability was unwarranted.

Macroeconomic stability is characterized in terms of the condition for fiscal balance, which is divided into four endogenous components: (i) the net fiscal surplus from, or subsidies to, the state production sector (i.e., value added minus the wage bill in the state sector); (ii) tax revenue collected from the private sector; (iii) official external grants and loans, net of interest and principal payments; and (iv) expenditures on "infrastructure" investment to transform economic institutions and provide an environment conducive to private economic development. 2/ To maintain macroeconomic stability, the sum of the first three components must be large enough to finance the fourth.

Political feasibility is assumed to depend on the effects of the transformation process on the economic welfare of the population, which the

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1/ For example, inadequate communication and transportation networks, an incomplete legal code governing property rights and business practices, and a financial system in which payments are settled slowly and credit allocation is based to a large extent on administrative discretion.

2/ In this breakdown of the fiscal accounts, transfer payments to unemployed workers and pensioners are viewed as part of the wage bill in the state sector, and spending on medical care, education, and other human capital investments are implicitly treated as part of infrastructure investment. A residual category is included in the formal analysis for completeness, but is taken to be exogenous.

model divides into three groups of economic participants--state sector workers, private sector workers, and private investors. In the spirit of Becker (1983), it is assumed that the political influence exerted by each group in support of, or opposition to, the transformation depends on the amount that its income changes in association with the process. This formalization captures the notion that the need to maintain domestic political support may impose a constraint on the extent to which the levels of state sector wages, transfer payments, and subsidies can be reduced in the short run.

The labor market is modeled in the spirit of Rosen (1978), which serves to emphasize the gains that are provided by a competitive environment in which heterogenous workers are induced to make occupational choices consistent with their comparative advantages. Studying the transformation process using Rosen's model, we show that even if a significant share of the population lacks the attributes necessary to find productive employment in the private sector, the economic efficiency costs in the short run of continuing to subsidize the consumption of these people--either through transfer payments or through wages that exceed their value added in the state sector--may be small relative to the long run economic gains from maintaining political support for the transformation process. 1/

While emphasizing the gains from unleashing competitive forces in labor markets and elsewhere, the analysis also provides perspectives on why transforming economies can easily fall into slow-growth or no-growth "traps," and likewise on the thresholds that must be overcome to catalyze economic transformation. 2/ Together, the conditions that must be satisfied to maintain macroeconomic stability and political feasibility may make it difficult or impossible for a country, in the absence of external support, to finance the level of public infrastructure that is necessary to stimulate significant amounts of private investment. Thus, in addition to requiring sound domestic macroeconomic policies, a successful economic transformation characterized by significant private investment may well require a "big push" with external financial and technical assistance.

II. Analytic Framework

Although economic transformation is inherently a lengthy undertaking, its success depends on decisions made by policy authorities and private investors early in the process. The analysis in this paper highlights the critical role of public and private investment by exploring the conditions

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1/ A dynamic extension of the analysis would strengthen this argument, recognizing that it is mainly older workers who lack the attributes to find productive employment in the private sector, so that the share of workers that must be subsidized to maintain political support will decline naturally over time.

2/ See Azariadis and Drazen (1990) for an analysis of threshold externalities in the accumulation of human capital.

under which ex ante decisions taken with perfect foresight by policymakers, private investors, and workers would make the transformation feasible. The restrictions derived from this ex ante/ex post analysis are interpreted as necessary conditions for a successful transformation.

1.   Human capital

The state sector and the private sector are assumed to require different work skills, which we denote by ℓ, "labor," and e, "effort," respectively. Agent i is endowed with (ℓ_i, e_i) effective units of labor and effort. The work supply decision is lumpy: agent i can either supply ℓ_i units of labor to the state sector or e_i units of effort to the private sector, but cannot do both. 1/ The total population of potential workers is N. A fraction s of the population, perhaps consisting mainly of older workers, is endowed with the skills $(\ell_s, 0)$; with no e-type skills, these workers are effectively locked into the state sector, which may either continue to employ them or support them through transfer payments (unemployment compensation). As discussed further below, we concentrate on the case in which these workers contribute nothing to output and represent either open or disguised unemployment, subsidized by the fiscal authorities. For the remainder of the population, the choice of whether to supply ℓ_i or e_i depends on w and r, the periodic "rewards" or factor payments for labor and effort. In general, agent i prefers to be employed in the state sector if and only if $w\ell_i > re_i$.

To streamline the analytic framework, we assume that state workers and unemployed individuals receive the same rate of compensation. In addition, to simplify aggregation, we impose the normalization $\ell_i + e_i = 1$ for all workers not locked into the state sector. Both assumptions could be relaxed without altering the main conclusions of the analysis.

Under the normalization assumption, agent i prefers to be employed in the state sector if and only if 2/

(1) $\ell_i > \Psi$ where $\Psi = r/(w+r)$

It is assumed that the distribution of talents among workers not locked into the state sector is characterized by a smooth density function $f(\ell)$ defined over the interval $0 \le \ell \le 1$. 3/ The aggregate supplies of effort and labor are thus given by:

(2) $E = E(w/r) = (1-s)N \int_0^\Psi (1-\ell)f(\ell)d\ell$

1/ This model is adapted from Rosen (1978). See also Mussa (1982), who applied Rosen's model in an international context.

2/ That is, $w\ell_i > re_i$ if and only if $\ell_i > \Psi$.

3/ Specifically, $(1-s)Nf(\ell)d\ell$ is the "mass" of agents whose endowments of labor, ℓ_i, fall within the interval $\ell \le \ell_i \le \ell + d\ell$.

$$(3) \quad L = L(w/r) = L_s + (1-s)N \int_{\Psi}^{1} \ell f(\ell) d\ell$$

where $L_s = s\ell_s N$. It can readily be shown that $\partial E/\partial(w/r)<0$ and $\partial L/\partial(w/r)>0$, and that the aggregate labor transformation curve is concave to the origin with slope $-w/r$, as illustrated in Figure 1. [1]/ Point A in Figure 1 represents the equilibrium allocation for a given (w,r).

To appreciate the gains from allowing heterogenous labor to pursue their comparative advantages, it is instructive to compare the general case with a hypothetical case in which all workers are identical with endowments equal to the population averages $\ell_i = \bar{L}/(1-s)N$, $e_i = \bar{E}/(1-s)N$. For this hypothetical case, the transformation locus is a straight line with slope $-\bar{E}/\bar{L}$, as depicted by the broken line in Figure 1. Under the actual outcome achieved in the initial stage of the transformation process, as represented by point A, L_a units of labor are devoted to state sector production and E_a units of effort are devoted to private sector production. Accordingly, the opportunity cost of not eliminating the state sector altogether in the initial stage is the additional private sector output that could be produced with an additional $\bar{E}-E_a$ units of effort, minus the state sector output that would be lost. By contrast, if all workers were homogeneous, the retention of L_a units of labor in the state sector would imply operating at point A', and the opportunity cost of not eliminating the state sector altogether would be much higher. Thus, to the extent that the maintenance of political support requires a transformation process that phases out the state sector gradually, the economic efficiency costs of such gradualism are reduced by unleashing competitive forces in labor markets and allowing those forces to induce an efficient allocation of heterogeneous workers.

2. Political feasibility

The transformation process splits the population into several groups with different sources of income: those agents who continue to supply labor to the state sector (including unemployed individuals, who receive transfer payments from the state); those who supply effort to the private sector; and those who invest their savings and earn a return on private-sector capital. Political feasibility essentially depends on whether those who perceive that their welfare is enhanced by the transformation process have more "political influence" than those who have the opposite perception. The balance of political influence thus depends importantly, although perhaps in a complex way, on how the different groups perceive that their income levels are affected by the transformation process.

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   [1]/ Note that: $\partial E/\partial(w/r)=-(1-s)N(1-\Psi)f(\Psi)[\partial\Psi/\partial(w/r)]$; $\partial L/\partial(w/r) = -(1-s)N\Psi f(\Psi)[\partial\Psi/\partial(w/r)]$; $\partial\Psi/\partial(w/r) = -1/(1+w/r)^2$; and $dE/dL = -(\partial E/\partial\Psi)/(\partial L/\partial\Psi) = -(1-\Psi)/\Psi = -w/r$.
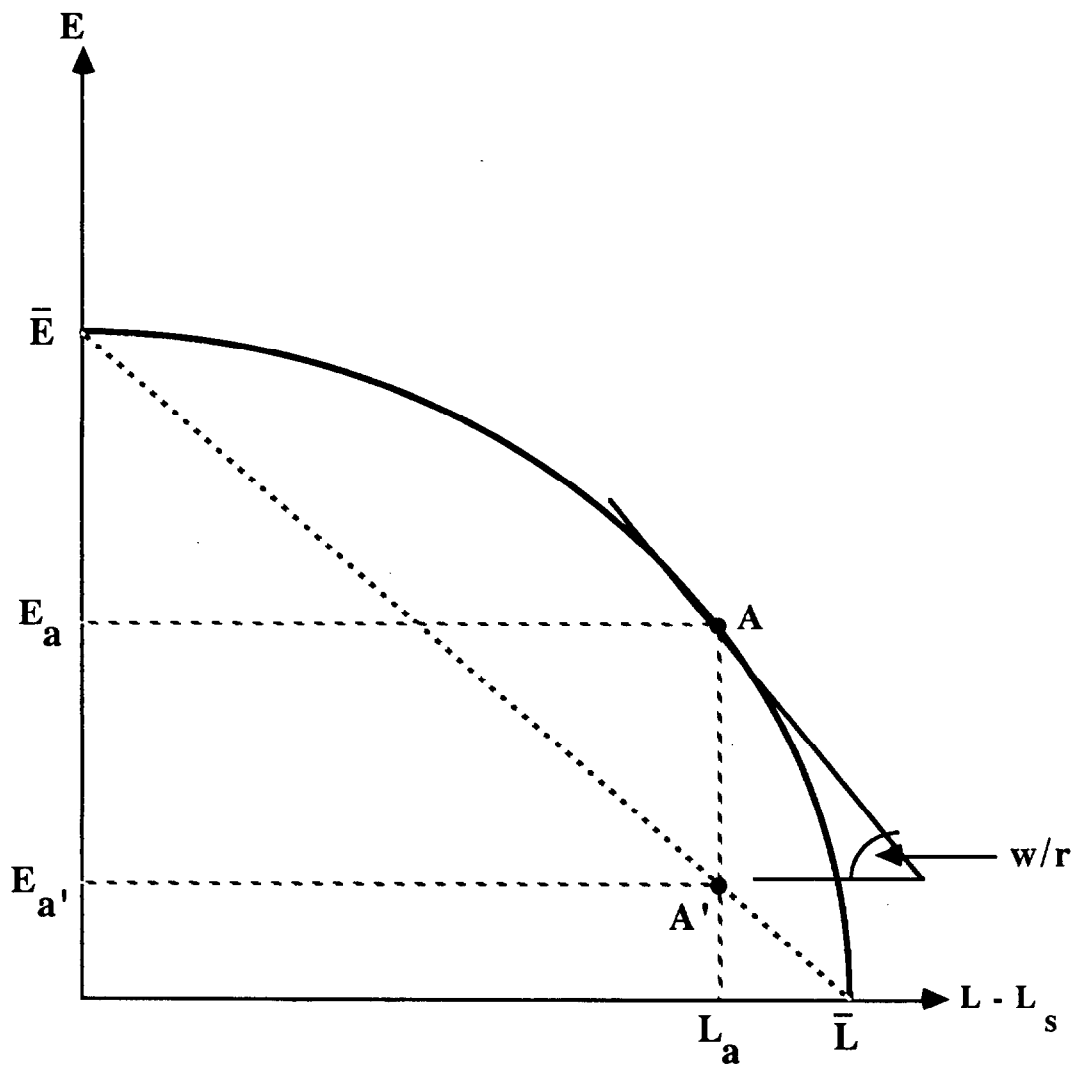
FIGURE   1

To represent this phenomenon formally, we consider a general political influence function of the form 1/

(4) $V = V(\Delta\text{income})$ where $V'>0$, $V''\leq 0$, and $V(0) = 0$

Let V_E, V_L, and V_I denote the values of V that correspond, respectively, to the gains or losses in the aggregate incomes of private sector workers, state sector workers, and private sector investors. The greater the increase in income that a group receives as a result of the transformation process, the more political pressure will be exerted by that group to support the transformation effort, and vice versa for a group whose income declines. We hypothesize that an outcome (w,r) is politically feasible if and only if

(5) $V_E + V_L + V_I \geq 0$

For purposes of establishing a base line from which to measure income changes, it is assumed that in the absence of the transformation process, all workers would provide labor to the state sector and receive an identical wage rate w_0. Thus, for the two groups of workers, the relevant values of V are

(6) $V_E = V\left[(1\text{-}s)N \int_0^\Psi [(1\text{-}\ell)r\text{-}\ell w_0]f(\ell)d\ell\right]$

and

(7) $V_L = V\left[L_s(w\text{-}w_0) + (1\text{-}s)N \int_\Psi^1 \ell(w\text{-}w_0)f(\ell)d\ell\right]$

For private investors, the relevant income change is taken to be the intertemporal consumer surplus attributable to investment, appropriately discounted, which measures the value of the investment opportunity in terms of current-period income. For simplification, we consider the case in which the stocks of savings and private domestic capital accumulated prior to the launching of the transformation process are zero. 2/ As discussed below, we define $\sigma(S)$ as the marginal rate of return required to induce private entrepreneurs to supply the level of savings S. This savings function is shown as the upward sloping curve in Figure 2. We assume that, in the initial stage of reform, when the productivity of domestic capital is held down by the relatively low stock of public infrastructure capital, it is attractive to channel part of savings through capital flight into investments in foreign-currency assets, I*, yielding the interest factor r*.

1/ See Becker (1983) for further details of a model that studies political influence.

2/ Relaxing this assumption would result in a more complicated expression for the intertemporal consumer surplus but would not alter the qualitative nature of the analysis.

The remainder is channeled into investment in domestic productive assets, I, yielding the return r_K, which will equal r* at the margin. Accordingly, V_I can be expressed as

$$(8) \quad V_I = V\left[r*(I+I*) - \int_0^{I+I*} \sigma(S)dS\right]$$

where, as shown later, the argument in square brackets represents the intertemporal consumer surplus attributable to investment, corresponding to the shaded area in Figure 2.

Note that, under the formulation in condition (5), political feasibility is not simply a matter of whether the number of winners exceeds the number of losers. As Becker (1983) has emphasized, political influence can be increased by spending time and money in various ways to exert pressure on policymakers. Consistently, conditions (4) and (5) assume that political feasibility depends on the outcome of a political "class struggle" between the three groups of income recipients that are identified in the analytic framework, where the political influence of each group is a monotonic function of the change in the aggregate income of the group. 1/

The set of politically feasible outcomes can be defined as a range of (w,r) combinations, conditional on the values of various exogenous parameters and predetermined variables. The "political support frontier" of this range is depicted in Figure 3 as the PP curve. As shown in section 1 of the Appendix, for the benchmark case in which V is linear, the PP frontier has a negative slope, and combinations of (w,r) are politically feasible if and only if they lie on or above the frontier. It is also shown in the Appendix that an increase in the stock of infrastructure capital expands the political feasibility set by shifting the PP curve inward. Similarly, a reduction in s, the "captive labor share," expands the political feasibility set by shifting PP inward, while also making the frontier less steep.

An increase in the tax rate on private sector output has an ambiguous effect on the level of private domestic investment, but has no effect on the PP curve. The effect on investment reflects two counteracting pressures: on the one hand, the tax increase tends to contract private domestic investment demand by depressing the marginal product of capital, while on the other hand, it tends to encourage private domestic investment by raising more revenues for public infrastructure investment. Regardless of the net effect, however, for the case in which a significant amount of savings is held in foreign currency investments, a marginal change in domestic

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1/ It would be preferable conceptually to make political influence a function of the present discounted value of the expected change in the stream of aggregate income over time, but the task of adding an explicit intertemporal dimension to the analysis (beyond that which applies to private investors) is an extension that we leave for another paper.
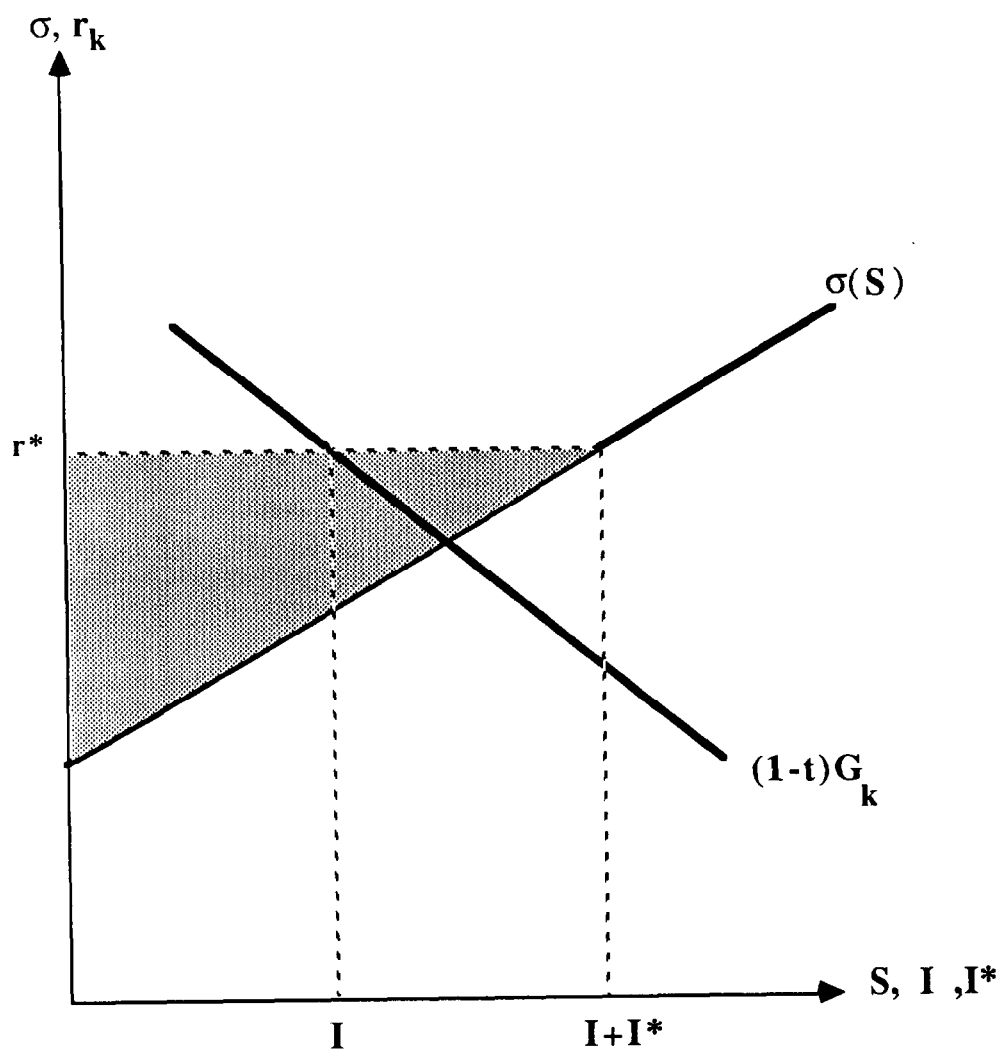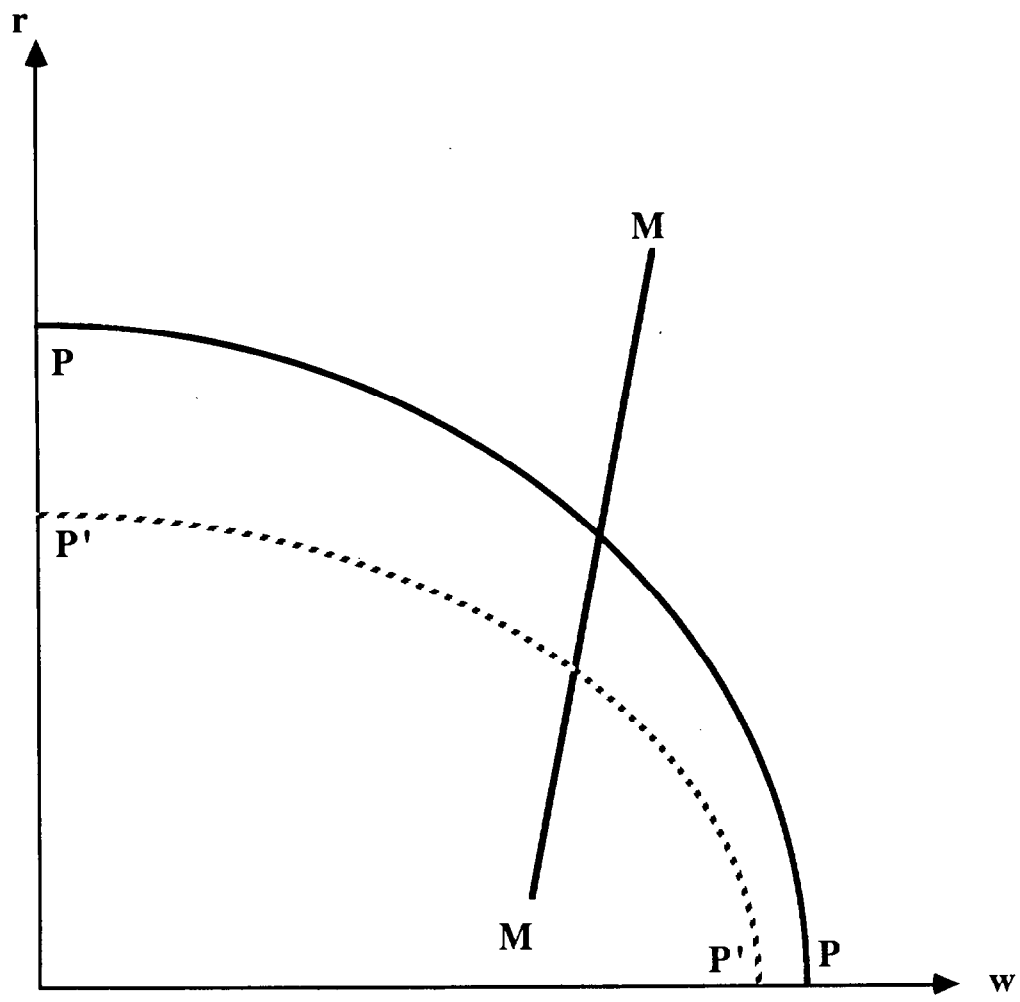
FIGURE 2

FIGURE 3

investment demand will simply lead to a shift in the allocation of savings between foreign assets and domestic assets without affecting the combined intertemporal consumer surplus attributable to the two forms of investment. Thus, the PP curve is independent of the tax rate.

3.   **Macroeconomic stability**

The outputs of the two sectors are valued at world market prices, which are both normalized to one. 1/ The respective production functions for the state sector and the private sector are specified as

(9) $H = H(L-L_S)$ with $H'>0$, $H''<0$

(10) $G = G(E,K,Z)$ with $G_E>0$, $G_{EE}<0$, $G_K>0$, $G_{KK}<0$,

$$G_{EK}>0, \ G_Z \geq 0, \ G_{EZ} \geq 0, \ G_{KZ} \geq 0$$

where K is the stock of private-sector capital and Z is the stock of public infrastructure. Condition (9) assumes that the workforce that is locked into the state sector (L_S) represents disguised or open unemployment that contributes nothing to output. 2/ State sector output therefore depends simply on $L-L_S$, which has a positive but diminishing marginal product. Condition (10) hypothesizes that the marginal private-sector products of effort and private capital are both positive but diminishing; it also allows for the possibility that public infrastructure not only contributes to output directly but also contributes indirectly by raising the marginal products of effort and private capital.

The fiscal budget is balanced when the following condition holds:

(11) $(H-wL) + tG + F = X(J)$

where H-wL represents the net fiscal surplus from, or (when negative) net subsidy to, the state sector; tG is the tax revenue collected from the private sector; F denotes official external grants and loans, net of interest and principal payments; $J=\Delta Z$ is the level of public "infrastructure" investment; and X includes the capital cost of the new infrastructure J, as well as any current maintenance costs. X may also include a predetermined level of residual public spending.

1/ In extending the analysis to an intertemporal framework, the economic forces leading to changes in relative prices over time would need to be modeled.

2/ The analysis can alternatively be developed for the case in which these workers are productive but have no employment opportunities outside the state sector. The main difference between the two cases lies in their implications for the size of the net fiscal surplus from, or subsidy to, the state sector.

We can now characterize the set of policy choices that are both economically feasible and consistent with budget balance. 1/ With F unconstrained, these choices must satisfy conditions (2), (3), (9), (10), and (11), together with the first order conditions

(12) $w = H'$

(13) $r = (1-t)G_E$

and a relationship (to be developed in the next section) that determines the stock of private sector capital

(14) $K = K(t,Z,E)$ with $K_t<0$, $K_Z>0$, $K_E>0$

Condition (12) assumes that the state sector pays competitive wages to its non-captive workforce $(L-L_s)$, while condition (13) assumes that the private sector provides competitive rewards to effort. It is also assumed that an increase in t would increase the tax revenue collected from the private sector (i.e., that the economy is not operating on the wrong side of the "Laffer curve").

4. Private investment

We now characterize the private savings and investment decisions underlying conditions (8) and (14). Private entrepreneurs are assumed to have a predetermined amount of initial resources $(\bar{Y}_0)$ available either for current-period consumption (C_0) or as savings (S) to be channeled into investment in either foreign assets (I*) or domestic capital (I), which will contribute to their future consumption (C_1). The entrepreneurs' problem is to choose both the level of savings and the composition of investment to maximize an objective function of the form

(15) $U(C_0) + U(C_1)/(1+\rho)$ with $U'>0$, $U''<0$

1/ In restricting attention to outcomes consistent with budget balance, we preclude the possibility of inflationary monetary financing of government spending. Non-inflationary monetary financing, while not incorporated explicitly into the model, could easily be included by adding an exogenous component of government revenue representing the level of seignorage associated with accommodating the expansion of real money demand in a non-inflationary manner. Government borrowing could also be included in the model as competing with private investment for the use of private savings, but we chose to leave this to a more extensive effort to add intertemporal dimensions to the analysis. Inflationary monetary financing is precluded on the grounds that an inflation tax leading to macroeconomic instability would discourage private investment and defeat the transformation effort regardless of the level of public infrastructure investment. We thus concentrate on analyzing the feasibility of the transformation for the case in which private investors base their ex ante decisions on the assumption that policy choices will maintain fiscal balance.

subject to the current-period budget constraint

(16) $C_0 = \bar{Y}_0 - S$

the income accounting identity

(17) $S = I + I*$

and the future consumption-possibilities condition

(18) $C_1 = \bar{Y}_1 + r*I* + (1-t)G - rE$

The parameter ρ represents a time rate of discount; $\bar{Y}_1$ is the predetermined component of future income; $r*I*$ is the income on foreign investments. As noted earlier, we assume that in the initial stage of reform, private entrepreneurs will find it optimal to allocate part of S to $I*$.

As shown in section 2 of the Appendix, the first-order conditions describing the optimal savings and investment decisions can be written as

(19) $\sigma = r_K = r*$

where

(20) $\sigma = (1+\rho) \, U'(C_0)/U'(C_1)$

is the discount factor adjusted for the diminishing marginal utility of consumption, and

(21) $r_K = (1-t)G_K$

is the marginal after-tax product of capital. In Figure 2, σ and $(1-t)G_K$ are depicted as functions of the levels of savings and private domestic investment, respectively. As shown in the Appendix, the shaded area in Figure 2 measures the intertemporal consumer surplus attributable to private investment

(22) $r*(I+I*) - \int_0^{I+I*} \sigma(S)dS$

which is also the argument of the political influence function in condition (8).

Notice that the position of the $(1-t)G_K$ curve in Figure 2, and hence the optimal level of private domestic investment, depends on t, Z, and E, the latter two of which enter the production function (10). Thus, the stock of private domestic capital can be described in the general form of condition (14). This condition captures formally the key point emphasized above and elaborated further below: namely, that the attainment of an adequate rate of private investment--which is central to the success of the

transformation process--may depend critically on a country's ability to build up an adequate stock of public "infrastructure" capital.

5. Joint economic and political feasibility

It is convenient to characterize policy choices in terms of the instruments t and J, noting that the set of economically feasible policy choices with F unconstrained corresponds to a set of feasible outcomes for (w,r,J). 1/ Obviously, if (w,r,J) is feasible for some F, then outcomes involving the same (w,r) and a higher J are also feasible for some higher F. The mapping of feasible (w,r,J) into (w,r) space is drawn as the MM curve in Figure 3, representing the macroeconomic equilibrium locus. It can be demonstrated that this mapping is indeed a positively sloped curve, and that reductions in w and r along the curve correspond to increases in J, given the predetermined level of F (and the level of any residual expenditures included in X).

This can be seen from Figure 4, in which panel I corresponds to Figure 1, while panels II and III respectively trace out the marginal products of effort and labor. At an arbitrary feasible outcome depicted by point A, the competitive wage rate and reward for effort are (w_1, r_1). The shaded area in panel II is the tax revenue collected from the private sector; the two shaded areas in panel III represent the subsidy to captive labor $(w_1 L_s)$ and the output generated by productive state-sector workers after subtracting their wages. The sum of the first and third areas, minus the subsidy, plus the predetermined level of F, is the amount available to finance $X(J)$. Note that a higher tax rate t would shift the $(1-t)G_E$ curve rightwards, reducing r, and reallocating agents from the private sector to the state sector. The new macroeconomic equilibrium would be at B, with a lower wage rate, a smaller level of net subsidies, a lower after-tax return to effort, and more net revenue to finance infrastructure investment, given F. 2/

Figure 5 summarizes the determination of the equilibrium outcome. Panel I shows the MM curve superimposed upon the political feasibility locus PP. For any specific level of J, the curve $R(J)$ in panel II shows the amount of domestic revenue that would be raised for each point on the MM curve, where

(23) $R = H - wL + tG$

Note that an increase in J from J_1 to J_2 shifts the $R(J)$ curve to the left, since a higher J raises both G_E and G and also requires a higher t for any

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1/ The designation of t as a policy instrument is arbitrary. Policymakers could equivalently treat w or r as a policy instrument, but only one of the triplet (t,w,r) can be set exogenously.

2/ In general, the positive slope of the MM curve is seen by differentiating $w=H'(L(w/r))$ to obtain $dr/dw = (r/w)-(r^2/wH''L')$ where $H''<0$, $L'>0$. Thus, $dr/dw>r/w$.
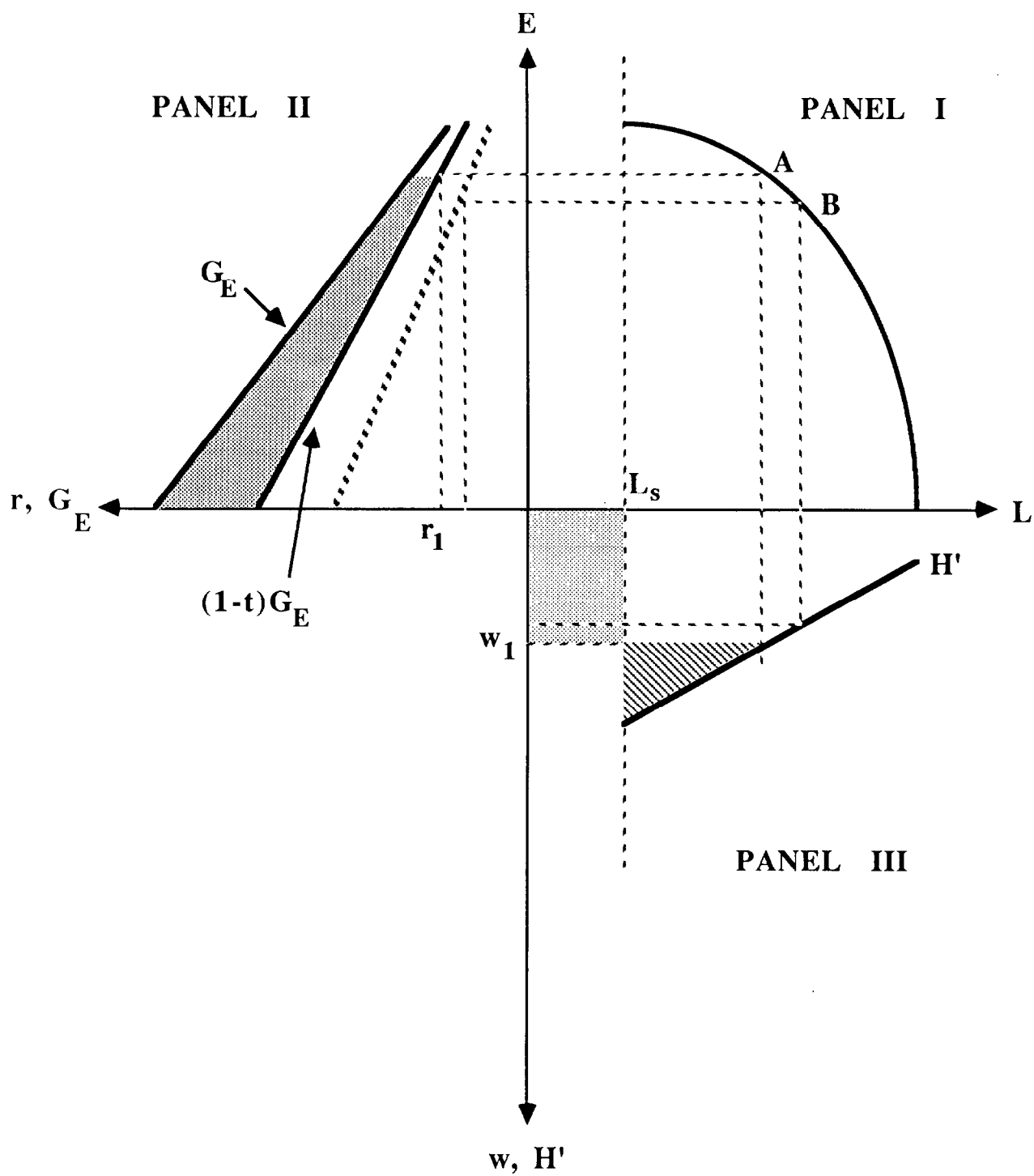
FIGURE 4

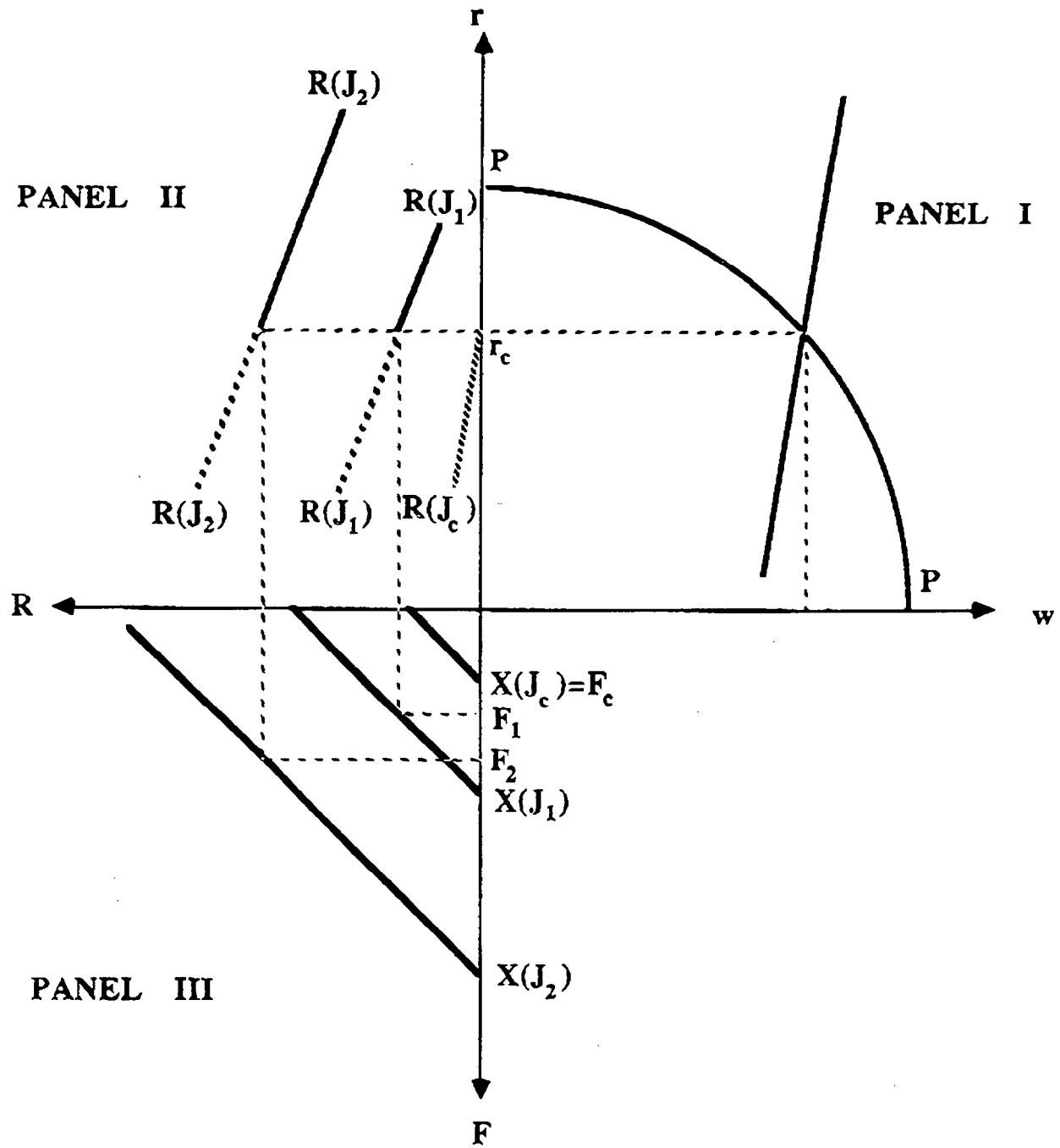FIGURE 5

given r. Panel III shows the budget constraint F=X(J)-R, which shifts to the left as J is increased. The equilibrium outcome must be both economically and politically feasible, thus corresponding to a point on the MM curve at or above the PP locus. Accordingly, an outcome that permits infrastructure investment at a level J_1 is only feasible if the level of foreign assistance amounts to at least F_1. Similarly, infrastructure investment at the level $J_2>J_1$ is only feasible if the level of foreign assistance is at least F_2.

Figure 5 and condition (23) illustrate why the transformation may be infeasible unless J, and hence F, exceeds some critical threshold level. Let (w_c, r_c) denote the point at which the MM curve intersects the PP curve; let H_c, L_c, and E_c denote values associated with that point; and note from (23), (10), and (14) that the value of R associated with (w_c, r_c) has the functional form $R(J,t) = H_c - w_c L_c + tG(t,J)$, where $\partial G/\partial J = (G_K K_Z + G_Z)Z_J > 0$ and hence $\partial R/\partial J > 0$. If $H_c - w_c L_c$ is sufficiently negative, implying that large subsidies to the state sector are required to maintain political support for the transformation process, there may also exist a critical threshold, J_c, such that $J < J_c$ implies $R(J,t) < 0$ over the entire range of the tax parameter t $(0 \le t \le 1)$. With reference to Figure 5, the critical threshold corresponds to the level of J for which the RR curve intersects the vertical axis at the critical value r_c. The associated critical threshold for external assistance is shown in the figure as $F_c = X(J_c)$.

Figure 4 provides parallel perspectives that link the feasibility of the transformation to the expansion of the private sector. Suppose that (w_1, r_1) in Figure 4 corresponds to (w_c, r_c) in Figure 5. Accordingly, $H_c - w_c L_c$ is the difference between the two shaded areas in panel III of Figure 4, which is likely to be large and negative, imposing a substantial burden on the fiscal budget. In the absence of any external assistance, macroeconomic stability would require that this drain on the budget be matched or exceeded by tax revenues from the private sector, as depicted by the shaded area in panel II. Meeting this requirement, however, could well be infeasible if the initial stock of public infrastructure was too primitive to provide attractive opportunities for building up the private capital stock.

III. Policy Perspectives

This paper has emphasized that the feasibility of the transformation process requires economic policies that are successful not only in establishing and maintaining macroeconomic stability, but also in maintaining political support for the process and in inducing an adequate rate of private investment. Using a streamlined ex ante/ex post analysis of the joint requirements for macroeconomic stability, political support, and adequate investment, the paper has supported the following policy perspectives.

First, since private sector investment can be greatly inhibited in the absence of a transparent legal environment and adequate communications and

transportation networks, among other important characteristics of the economy, the rapid development and strengthening of public "infrastructure" in these areas may be critical for achieving an adequate rate of private investment. The development of public infrastructure may in turn depend critically on the availability of both financial resources and external technical assistance.

Second, in a democracy, political forces may limit the financial resources that governments can raise domestically to finance infrastructure investment. The main sources of domestic public revenues--apart from increasing productive efficiency in the state sector--are to reduce subsidies and transfer payments (primarily to the state sector and the unemployed) and to raise taxes (primarily on the private sector). 1/ But if taxes on the private sector are raised too high, private investment will be discouraged; and if living standards are suppressed too much in the short run, political support for the transformation effort will be lost.

Third, attempts to finance public infrastructure through monetization are likely to be counterproductive. The rate of private investment depends not only on the development of public infrastructure, but also on the prospects for maintaining a stable macroeconomic environment. Governments that yield to the temptation of abandoning monetary and fiscal discipline in the short run can easily destroy the prospects for private sector growth over the medium run.

Consequently, the critical thresholds for public infrastructure investment and private investment may not be feasible in the absence of adequate external financial assistance in the short run. This conclusion, however, requires two qualifications. External financial assistance is not an appropriate substitute for reducing domestic subsidies and transfer payments to whatever extent is politically feasible and economically efficient. Moreover, in many respects, external financial assistance may not be as valuable as external technical assistance for the development and strengthening of public infrastructure.

In modeling how the requirements of macroeconomic stability and domestic political support interact with the level of external assistance to determine whether the transformation process is feasible, the paper has emphasized that the prospect for a successful transformation is enhanced by the competitive forces unleashed in labor markets. The production gains that are generated when market forces induce heterogenous labor to pursue occupational choices consistent with their comparative advantages reduces the economic efficiency cost of a transformation process that preserves political support by contracting the state sector gradually. The operation

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1/ It should be noted, however, that properly designed subsidies can raise productive efficiency in the state sector. See Aizenman and Isard (1993) for an analysis of production bottlenecks in the state sector and the appropriate role of subsidies in mitigating negative externalities and increasing productive efficiency.

of market forces insures that workers who are relatively more productive in the private sector will shift to that sector, while those who are relatively more productive in the state sector will remain there. Combining this effect with the diminishing marginal productivity of inputs further reduces the efficiency cost of phasing out the state sector gradually over the medium run.

An extension of the ex ante/ex post analysis to a dynamic model (such as the overlapping generations framework) would strengthen this message. Initially, the older generation is likely to have limited employment flexibility but significant political clout. In contrast, the young and the unborn generations have potentially much greater employment flexibility, but typically lack political clout. This suggests that the process of down sizing the state production sector has an automatic phasing out element as older workers retire. As long as the economic environment provides proper incentives for the emerging private sector, the progression of time will reduce the size of the old state sector. The new generation will vote by foot in favor of the emerging sector, and against the declining one. Most of the old workers retiring from the state sector will not be replaced. This process will reduce over time both the political pressures to preserve state enterprises and the economic efficiency costs of maintaining domestic political support.

Derivations

1. The set of politically feasible outcomes

Consider first the set of (w,r) that satisfy condition (5) with equality, corresponding to the political support frontier as depicted by the PP curve in Figure 3. The slope of the PP curve is

$$(A1) \quad \left.\frac{\partial r}{\partial w}\right|_{pp} = - \frac{(V_{Ew} + V_{Lw} + V_{Iw})}{(V_{Er} + V_{Lr} + V_{Ir})}$$

where $V_{Iw} = V_{Ir} = 0$ since $S = I + I*$ is insensitive to both w and r. Letting V_E' and V_L' denote the derivatives of V at the points at which V_E and V_L are evaluated,

$$(A2) \quad V_{Ew} = V_E'(1-s)N(w-w_0)\Psi f(\Psi)\frac{\partial \Psi}{\partial w}$$

$$(A3) \quad V_{Lw} = V_L'\left\{L-(1-s)N(w-w_0)\Psi f(\Psi)\frac{\partial \Psi}{\partial w}\right\}$$

$$(A4) \quad V_{Er} = V_E'\left\{(1-s)N(w-w_0)\Psi f(\Psi)\frac{\partial \Psi}{\partial r} + E\right\}$$

$$(A5) \quad V_{Lr} = -V_L'(1-s)N(w-w_0)\Psi f(\Psi)\frac{\partial \Psi}{\partial r}$$

Thus, letting

$$(A6) \quad a_w = (1-s)N(w-w_0)\Psi f(\Psi)\frac{\partial \Psi}{\partial w}$$

$$(A7) \quad a_r = -(1-s)N(w-w_0)\Psi f(\Psi)\frac{\partial \Psi}{\partial r}$$

and combining (A1) - (A7),

$$(A8) \quad \left.\frac{\partial r}{\partial w}\right|_{pp} = - \frac{\dfrac{LV_L'}{V_E'} + \left(1-\dfrac{V_L'}{V_E'}\right)a_w}{E - \left(1-\dfrac{V_L'}{V_E'}\right)a_r}$$

In general, the slope of the PP curve cannot be signed without further information on the relative magnitudes of V_E' and V_L'. However, for benchmark case in which V is linear, $V_E' = V_L'$ and the right hand side of (A8) simplifies to $-L/E$. Thus, in this benchmark case the PP curve is negatively sloped.

Note also that, in this case, $V_{Ew} + V_{Lw} = V_L'L > 0$; thus, for any point on the PP curve, all other points with greater values of w and the same value of r are also politically feasible.

Next consider how the PP curve shifts with changes in various parameters or predetermined variables. When condition (5) holds with equality and V is linear with slope V'

(A9) $V'\left[(1-s)(\tilde{E}r + \tilde{L}w - \tilde{L}_0 w_0) + s\tilde{L}_s(w-w_0)\right] + V_I = 0$

where

(A10) $\tilde{E} = E/(1-s) = N\int_0^\Psi (1-\ell)f(\ell)d\ell$

(A11) $\tilde{L} = (L-L_s)/(1-s) = N\int_\Psi^1 \ell f(\ell)d\ell$

(A12) $\tilde{L}_0 = N\int_0^1 \ell f(\ell)d\ell$

(A13) $\tilde{L}_s = L_s/s = \ell_s N$

For a change in the parameter or predetermined variable υ ($\upsilon = Z, s$), we consider an arbitrary point (w,r) that satisfies (A9) and identify the direction in which the PP curve shifts by evaluating the sign of

$\left.\dfrac{dr}{d\upsilon}\right|_{\Delta w=0}$. In differentiating (A9), note that a change in r affects

$\tilde{E}$ and $\tilde{L}$ through Ψ, but that

$\dfrac{\partial(\tilde{E}r+\tilde{L}w)}{\partial\Psi} = 0$, implying

$\dfrac{\partial(\tilde{E}r+\tilde{L}w)}{\partial r} = \tilde{E}$

It is readily seen that an increase in the stock of infrastructure shifts the PP curve inward. Specifically:

$$(A14) \quad \left. \frac{dr}{dZ} \right|_{\Delta w=0} = - \frac{1}{(1-s)\tilde{E}} \frac{dV_I}{dZ} \leq 0$$

since, according to (8), (21), and (10), an increase in Z increases V_I.

Since V_I is unaffected by s, it is also readily seen that

$$(A15) \quad \left. \frac{dr}{d[s/(1-s)]} \right|_{\Delta w=0} = \frac{\tilde{L}(w_0 - w)}{\tilde{E}}$$

Note from (4), (6), and (7) that the point $(w,r)=(w_0,0)$ is associated with $\Psi=0$ and $V_E=V_L=0$. Accordingly, with $V_I \geq 0$ and the PP curve shaped as depicted in Figure 3, it must be that $w<w_0$ for all points on the PP curve except perhaps the corner point where $r=0$. At the latter point, $w=w_0$ if $V_I=0$, and $w<w_0$ if $V_I>0$. Thus, a reduction in s (and hence in $s/(1-s)$) shifts the PP curve inward. Moreover, the extent of the shift is inversely related to w, so a decrease in s also makes the PP curve less steep.

2.   The levels of savings and investment

Consider the objective function defined by condition (15). Let $\bar{U}_R$ be its value under the reform regime and $\bar{U}_N$ be its value in the absence of the transformation process. Under the latter contingency we have assumed for simplification that private savings and investment would be zero, and that the income and consumption levels of the prospective private entrepreneurs would be $\bar{Y}_0$ and $\bar{Y}_1$ in periods 0 and 1, such that the objective function would take on the value

$$(A16) \quad \bar{U}_N = U(\bar{Y}_0) + U(\bar{Y}_1)/(1+\rho)$$

Under the reform regime,

$$(A17) \quad \bar{U}_R = U(\bar{Y}_0 - S) + U(\bar{Y}_1 + r \ast I \ast + (1-t)G - rE)/(1+\rho)$$

Accordingly 1/

$$(A18) \quad \bar{U}_R - \bar{U}_N = U(\bar{Y}_0-S)-U(\bar{Y}_0) + \frac{U(\bar{Y}_1+r*I*+(1-t)G-rE) - U(\bar{Y}_1)}{1+\rho}$$

where the optimal allocation of saving between foreign and domestic investment requires

$$(A19) \quad r* = (1-t)G_K$$

and the optimality of the level of savings requires

$$(A20) \quad \frac{\partial(\bar{U}_R-\bar{U}_N)}{\partial S} = - U'(C_0) + \frac{r*U'(C_1)}{(1+\rho)}$$

Thus, using the definitions (20) and (21),

$$(A21) \quad \frac{(1+\rho)}{U'(C_1)} \frac{\partial(\bar{U}_R-\bar{U}_N)}{\partial S} = - \sigma(S) + r*$$

and the first-order condition characterizing the optimal level of S corresponds to (19). Furthermore, when (A21) is integrated up to the optimum at I+I*,

$$(A22) \quad \frac{(1+\rho)}{U'(C_1)} (\bar{U}_R-\bar{U}_N) \approx \int_0^{I+I*} [r*-\sigma(S)]dS$$

Note that the left hand side of (A22) represents the increase in utility associated with the opportunity to save and invest ($\bar{U}_R-\bar{U}_N$), converted into units of current-period income by dividing by the present discounted value of the marginal utility of future income.

1/ The expressions for $\bar{U}_N$ and $\bar{U}_R$ would be altered if the initial stocks of savings and private domestic capital--i.e., the stocks in the absence of the transformation process--were not zero. However, the logic of the analysis and the qualitative nature of the conclusions would not be altered.

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