# **Comments**

**José Miguel Benavente:** This is a very interesting paper that tries to answer a fundamental question for a least-developed country: what do Salvadorans have to do to trigger growth? El Salvador has implemented most of the standard recipe to foster growth, without any success. In other words, it has been a great reformer, but a poor performer.

The authors argue that the problem may be related to the growth of production, suggesting a close view to the production side. By putting the firm at the heart of the analysis, they develop a conceptual framework (published elsewhere) in which the expected return to accumulating human or physical assets is given by the multiplication of saving or investment efforts times appropriability times productivity. Therefore, three strategies clearly deserve some attention in analyzing how private returns have evolved in El Salvador in recent years.

The authors spend almost a third of the paper convincing the reader—without any econometrics—that neither investment/savings and education nor appropriability issues should be viewed as a strategy for triggering growth in the case of El Salvador, although it is useful to sustain it. With regard to the third strategy, they argue that enhancing innovation and productivity should be a major goal for this country in the coming years, but not in the traditional (comparative advantage) sectors like cotton, coffee, or even *maquila*. A structural transformation should be implemented, meaning the creation of new sectors. This transformation should be addressed as a policy issue.

But why do new industries not take off on their own? The authors suggest that El Salvador is characterized by at least two kinds of pathologies: (i) government failures, featuring inadequate information, problems of capture, and time inconsistency, and (ii) market failures, related to technology externalities, coordination externalities, and informational externalities. Although I do agree

1. See Hausmann, Rodrik, and Velasco (2005).

with the analysis and interpretation of these pathologies, I would add one more closely related explanation for El Salvador's lack of growth: institutional failure. By this, I mean the poor quality of agents directly related to production: entrepreneurs, public agencies, and the environment in which they interact.

A recent study on entrepreneurship shows that Salvadoran entrepreneurs create their firms as a necessity and not as a source of prosperity, in contrast with other countries like Chile.<sup>2</sup> The study shows that Chilean entrepreneurs were better trained, older, worked previously as an employee, and were more goal-oriented than their Salvadoran counterparts. Although firms in both countries started with a similar size, on average, the Chileans had grown much faster after three years. More than 200 entrepreneurs in El Salvador cited serious financial constraints and taxation barriers that jeopardize entrepreneurship. At the same time, Salvadoran social, production, and institutional networks are very weak, especially in aspects related to information and technology.<sup>3</sup>

Public agencies also matter. The study does not say much about this issue for the Salvadoran case, but the Chilean examples given stress that institutions are important. For example, Fundacion Chile, the Production Development corporation (CORFO), and Pro Chile, as correctly suggested in the paper, were a fundamental pillar in the creation of new industries (sectors), but a critical point is that these institutions were in place before the growth was trigged in Chile.<sup>4</sup>

In the same line, I would thus add a forth element to Summers' trinity, which Hausmann and Rodrik cite: namely, that managerial and entrepreneurial skills matter.<sup>5</sup> Structural changes to the production matrix will (also) depend on their animal spirits, risk tolerance and teamwork, as well as on the previous institutional setup.

Finally, technological innovation is another component in this complex puzzle for El Salvador. Figures for this country show a very poor performance in all the main science, technology, and innovation indicators. Although this is an interesting issue not only for El Salvador but also for countries like Chile, policymakers have only recently become convinced that R&D and related activities are a crucial source of growth. We do not have to forget that most industrialized countries became developed because they invested in technology—not the other way round.

- 2. Kantis (2004).
- 3. See Kantis (2004, table 2.10).
- 4. A historical view of the development of these institutions and their importance for the creation of new industries in Chile can be found in Ffrench-Davis and others (2000).
  - 5. Summers (2003).
  - 6. See Benavente (2005).

Francisco Rodríguez: The paper by Ricardo Hausmann and Dani Rodrik constitutes a useful and enlightening application of the theoretical ideas proposed in two previous papers. The comments in this note center on three aspects of the paper under discussion: the theoretical framework, the identification of binding constraints on growth in El Salvador, and the conditions necessary to implement the authors' policy proposal.

## The Theoretical Framework

The authors take as their starting point the theoretical framework expressed in an equation that expresses the growth rate as a multiplicative constraint of the saving and investment effort, the appropriability of returns, and the level of productivity. The authors suggest that an appropriate approach to thinking about how to increase growth in this setup is to identify the "most binding" constraint, that is, the constraint that generates the highest payoff when it is relaxed.<sup>2</sup> This thinking is put forward in the context of a more general framework, where the focus is on welfare and not growth, in their earlier work.<sup>3</sup> For the moment, however, I stick to the simpler framework of the above-mentioned equation, which I rewrite, following Hausmann, Rodrik, and Velasco, as

(1) 
$$\gamma_c = \frac{r(1-\theta)(1-\psi)(1-x)-\rho}{1-\beta},$$

where  $\gamma$  is the growth rate of consumption, r the rate of return (which depends on productivity),  $\theta$  the level of uninternalized external effects,  $\psi$  the level of distortionary taxation, (1 - x) the expected appropriability,  $\beta$  a measure of constraints on borrowing, and  $\rho$  the discount rate.

- Hausmann, Rodrik, and Velasco (2005); Hausmann and Rodrik (2003).
- 2. Hausmann, Rodrik, and Velasco (2005) actually show three ways to identify the most binding constraint. In section 2.1.5, they suggest ignoring second-best interactions across markets and focusing on the largest direct effect, that is, that with the largest associated Lagrange multiplier. Their formal growth analysis in section 3, however, focuses on the total effect on balanced-growth welfare of eliminating different distortions, effectively incorporating second-best interactions in the calculation. In contrast, their applied analysis in section 4 discusses the total (direct and indirect) effect on a reduced-form equation for economic growth. It is this third approach that is repeated in the paper under discussion, and the one I follow in this note.
  - 3. Hausmann, Rodrik, and Velasco (2005).

The authors tackle the analysis of growth strategies in this context by first defining which distortions must be taken as given (thus making explicit the fact that their analysis is second-best) and then asking which of the remaining distortions will generate the highest marginal payoff when relaxed.

The first point that I would like to make about this framework is that it relies on the implicit assumption that the analyst can change at most one constraint at any given moment in time. This assumption may or may not make sense, but it is not made explicit at any point in the analysis. It is therefore difficult to understand exactly what implicit constraint the authors are making.<sup>4</sup>

Let me make this case in the simplest context possible. Suppose borrowing constraints, productivity, and appropriability are given, and policymakers are trying to decide whether to focus their efforts on reducing distortionary taxation ( $\psi$ ) (by eliminating wasteful government expenditure) or reducing production externalities ( $\theta$ ) (by promoting the type of policies for self-discovery suggested in the text). Suppose the policymakers have two choices: they can completely eliminate one of these two distortions, or they can reduce both of them by half. What would they choose?

Let  $\Delta_j$  denote the payoff from eliminating the constraint,  $j = \{\theta, \psi\}$ , and let  $\Delta_{\frac{1}{2}(\theta, \psi)}$  denote the payoff from reducing both of them by one-half. One can assume, without loss of generality, that  $\theta \geq \psi$ . It is then straightforward to prove that  $\Delta_{\theta} > \Delta_{\psi}$ . The payoff from completely relaxing one constraint is thus the same as that which comes from completely relaxing  $\theta$ :

(2) 
$$\Delta_{\theta} = \frac{r(1-\psi)(1-x)\theta}{1-\beta}.$$

Now suppose the policymaker can reduce the two constraints to half of their present value at the same time. That is, instead of concentrating on eliminating the most binding constraint, the policymaker decides to target a combination of the two constraints. The payoff will now be

(3) 
$$\Delta_{\frac{1}{2}(\theta,\psi)} = \frac{r(1-x)[(\psi/2)+(0/2)-(30\psi/4)]}{1-\beta}.$$

4. In Hausmann, Rodrik, and Velasco (2005), the strategy of focusing on the most binding constraint is presented as one of a list of potential reform strategies, which also include wholesale reform, doing as much reform as well as possible, second-best reform, and targeting the biggest distortions. The option of contemplating combinations of reforms that generate the highest direct payoffs is not explicitly considered.

Note that

$$\Delta_{\frac{1}{2}(\theta,\psi)} > \Delta_{\theta} \iff \theta < \frac{\psi}{1 - \left(\psi/2\right)}.$$

Since  $\psi < \psi/[1 - (\psi/2)]$ , there is a range of parameter values for which it will be optimal to follow the strategy of relaxing both constraints instead of only one. This range can be quite large. For example, if  $\psi > \frac{2}{3}$ , then reducing both constraints by half will always be better than relaxing one constraint completely.

In this simple example, I have assumed that the elimination of one constraint is as feasible as the reduction of two constraints to half their starting values. This is, of course, an arbitrary assumption, but the point I wish to stress is that the costs of changing policies need to be modeled explicitly to uncover the possible trade-offs of adopting alternative reform strategies. In the meantime, I would caution against assuming a priori that one should concentrate on only one constraint at a time.<sup>5</sup>

An alternative—and more appealing—interpretation of the Hausmann-Rodrik-Velasco framework, which the authors seem to have in mind at several points in their exposition, involves a policymaker who does not know what the second-best solution is.<sup>6</sup> She might know what the first-best solution is, but that is of little use because some constraints cannot be relaxed. She simply knows that she faces a highly nonlinear problem, in which reforms that might appear to be in the direction of the first-best solution can have disastrous welfare consequences. In that context, the Hausmann-Rodrik-Velasco framework proposes what seems to be a sensible strategy for reaching the second-best solution: relax one constraint at a time, in a direction that will generate the greatest increase in growth at a given point in time.

- 5. Hausmann, Rodrik, and Velasco (2005) briefly present a more complete framework in section 3.10, where they explicitly incorporate a political constraint. The framework is totally static, however, and thus says nothing about the number of strategies that can be changed at any given moment in time. On the contrary, the solution to the problem they pose indicates a second-best policy vector, to which it will be optimal to move immediately and which is likely to differ along more than one dimension from the starting policy vector.
- 6. "The difficulty with a second-best reform strategy is that many, if not most, of these second-best interactions are very difficult to figure out and qualify ex ante. The strategy requires having a very good sense of the behavioral consequences of policy changes across different markets and activities. . . . In practice, most of the second-best interactions remain obscure, and tend to be revealed after the fact rather than ex ante" (Hausmann, Rodrik, and Velasco, 2005, p. 7, emphasis added).

Posed this way, the framework is perfectly analogous to a nonlinear programming problem, in which the goal is to maximize a function with constraints, but both the function and the constraints are so highly nonlinear that it is not clear where the maximum lies. If this analogy is correct, then the field of economic policy reform has much to learn from nonlinear optimization theory. Two basic lessons strike me as evident. The first one parallels the point already made, in that changing one policy at a time will generally be a very inefficient way of reaching the maximum of this function. The majority of techniques with desirable convergence properties in nonlinear optimization tend to change all the parameters at every step, after identifying the direction of maximum increment that can be achieved. Restricting the process to changing only one parameter at a time may not only increase the time that it takes us to reach an optimum (thus generating welfare losses during the transition), but also increment the probability of not converging to the optimum.

A second lesson to be learned from the analogy is that the possibility of getting stuck at a local, but not global, maximum must be taken seriously. Many appealing characterizations of the development process take the form of models with poverty traps, from which it can be difficult to escape. For example, Murphy, Shleifer, and Vishny's classic characterization of underdevelopment describes how an economy's low productivity and low levels of aggregate demand reinforce each other, generating a low-level equilibrium in which the economy is not large enough to adopt more efficient technologies, and its low productivity generates a low aggregate demand.<sup>7</sup> From the perspective of relaxing the most binding constraints, it may appear that there is not much that can improve this economy's situation. Given its low productivity, higher aggregate demand will do little except generate inflation; given its low aggregate demand, the introduction of more efficient technologies will generate huge losses for whoever pays the fixed cost of techniques that only make sense in large markets. In this context, the model requires that policymakers think not only about changing both policy dimensions at once, but also about the need for large changes in them. These examples are not meant to argue that the Hausmann-Rodrik-Velasco framework should be rejected. Indeed, they prove its usefulness precisely because they are not issues that are likely to be raised in this way without their framework. As with any useful model, however, its use requires not only knowing how to apply the framework, but also knowing when to think outside it.

<sup>7.</sup> Murphy, Shleifer, and Vishny (1989).

# The Binding Constraints of the Salvadoran Economy

The Hausmann-Rodrik-Velasco methodology leads to a one-by-one analysis of the different potentially binding constraints on economic growth. The strategy is one of inference by iterative elimination: the authors argue that the binding constraint cannot be the availability of credit (as that is plentiful), human capital (as it shows low returns), or appropriability (as the country has good protection of property rights and macroeconomic policies); therefore, the problem must be low returns to investment. This is where the self-discovery theory kicks in: since traditional sectors are not doing very well, the problem must be that investors have not yet discovered the new sectors that must replace them. Discovering new sectors requires solving the informational externalities that drive the authors' self-discovery theory: El Salvador needs to create a strategy that creates incentives for entrepreneurs to discover where the country has a comparative advantage.

Although the authors may be right in pointing to the lack of incentives for gathering information on the economy's comparative advantage as an important component of Salvador's growth problems, the strategy of iterative elimination makes their argument heavily dependent on the lack of relevance of other constraints. As emphasized above, a strategy of thinking about one binding constraint will not always be the most productive one; most likely, at times several constraints will be binding, in the sense that relaxing them together, even by a small amount, would be better than concentrating on just one. In their iterative elimination, the authors rush too rapidly to dismiss a number of potential constraints that may be playing an important part in El Salvador's growth problems.

First is the role of education. The authors echo Pritchett's argument that expansions in the fraction of educated individuals that are unaccompanied by increases in the economic growth rate are indicative of a small social payoff to education. As Pritchett recognizes, this result is true to the extent that the quality of education is held constant. If the quality of education is falling, then increases in the number of educated workers may not necessarily translate into a higher quality-adjusted workforce, and there is no reason why they should affect the growth rate positively. Frankly, I would be surprised if the decade of political violence in El Salvador had not had a substantial effect on the capacity of its school system to deliver adequate education. Indeed, the authors present an interesting piece of evidence that points in this direction.

8. Pritchett (2001).

According to the data in table 2, the wage premiums earned by the cohort of 36- to 40-year-olds in 1992 were on average 25.6 percent greater than those of the cohort of 25- to 30-year-olds. This age difference corresponds to the difference between those who were educated before the war and those who were educated during the war. The data seem to confirm that the quality of schooling fell considerably during the war. Whether it recovered is a question that will require further research and time to answer. Education may well be a binding constraint in El Salvador, and a high payoff may be achieved by raising educational quality.

This argument may apply more broadly to many public goods and services, whose provision suffered both from the war and from inadequate reconstruction efforts. In discussing whether taxes may be too high, the authors admit that "tax revenue may be so low that the government lacks the resources to provide an adequate supply of public goods needed to make economic activity productive." The authors do little to pursue this explanation further, but it seems to me that herein lies a major, if not the main, constraint to economic growth.

Many pieces of evidence point to a widespread collapse in the provision of public goods during the war (and inadequate recovery in the aftermath). For example, El Salvador's war was characterized by a prolonged attempt by the Farabundo Martí National Liberation Front (FMLN) guerrillas to cause the regime's economic collapse by demolishing the nation's infrastructure. Existing estimates put the cumulative total cost of economic sabotage by the FMLN between 1980 and 1990 at \$1.0–1.5 billion. From 1981 through mid-1987, the FMLN destroyed or seriously damaged eighty-three of the country's ninety-two major bridges, including the country's two largest, which connected San Salvador to other departments. In an economy traditionally reliant on a small number of agricultural exports, destroying roads and bridges also meant destroying the means whereby export goods are brought to markets, and it may be associated with the subsequent lackluster performance of the economy's traditional export sectors.

A much less tangible example is the rule of law. El Salvador's homicide rate, at 50.2 per 100,000, is now the second highest in the world, and it is 9.12 times that of neighboring Costa Rica and 6.9 times that of Nicaragua. In a 1999 survey, 55 percent of Salvadorans stated that crime would justify a coup d'état. In Some analysts have traced the high violence rates in El Salvador to

<sup>9.</sup> INS (2000).

<sup>10.</sup> WHO (2002, table 2.1).

<sup>11.</sup> Wood (2001).

the rapid demobilization of the two armies and the lack of an effective restructuring of police forces, which represent particularly costly state failures.<sup>12</sup>

These facts all point to the possibility that the prolonged civil war caused a severe decline in the state's capacity to provide a broad array of public goods and services that are necessary for the safe conduction of profitable economic activity. The emphasis on sound macroeconomic policies and fiscal solvency prevalent during the post-war period may have coincided with a less-than-adequate channeling of resources to the rebuilding of the nation's economic and social infrastructure. Similarly to the pattern identified by Easterly and Servén for Latin America more broadly, the economy may have been saving in financial resources at the cost of sacrificing important public productive assets. <sup>13</sup> The resulting lack of public and social capital will function as a binding constraint on present economic growth, which will manifest itself in the low perceived rates of return on domestic investments that the authors identify.

### Varieties of Intervention

When it comes to policy design, Hausmann and Rodrik have a difficult task. The type of distortion that they identify can only be addressed by government intervention, yet the history of government intervention aimed at creating successful export industries in Latin America is not very encouraging. As they recognize, the problems of state capture and dynamic inconsistencies of intervention policies are pervasive. The authors must convince their readers that they have come up with an institutional design that is relatively protected from those sources of policy failure. The authors' proposal contains three key components that are meant to create these conditions. First, the strategy must be seen as a high-level goal of the government, so that it will garner the commitment of the political leadership and force bureaucrats to take their jobs seriously. Second, it must have a high degree of transparency and accountability, so that bureaucrats will not be able to disguise their actions from the general public. Third, there must be a set of rules (for example, built-in sunset clauses, clear benchmarks for success or failure, and incentives targeted to new activities) that will stop the initiative from serving other purposes than those for which it is designed.

<sup>12.</sup> See, for example, Kincaid (2000).

<sup>13.</sup> Easterly and Servén (2003).

This design makes sense in theory, but I have my doubts as to whether it is likely to work in practice. Too many high-profile initiatives in the region have ended up in the dustbin of economic ideas, quickly forgotten after the political benefits to be gained from their implementation were reaped. It is difficult to believe in the power of rules, legal or otherwise, in a continent whose most recent political developments include the ouster of a president for abandonment of his post while he was sitting in the presidential palace. Transparency and accountability have little effect unless those to whom you are accountable actually have an incentive to make you behave differently.

Contrasting these elements with successful cases of developmentalist strategies reveals a striking fact: the regimes that were able to successfully engineer these strategies did not tend to implement them through bodies whose actions were very transparent or accountable (at least in the sense of public accountability, or the possibility of embarrassment stressed by the authors) or that were bound by strict limits on their actions. One of the few things that the Korean, Taiwanese, and Chilean states all shared was a high degree of discretion in their capacity to design, implement, and modify policy interventions and an almost absolute protection from public criticism.

Another common element in these three experiences is that they all arose in response to a real threat of disappearance of the private sector through a takeover by extreme-left regimes. They can thus be seen as instances of a particular type of Hobbesian solution, in which private elites concede much of their power to the military because this is the only way that they can be saved from the greater threat of wholesale expropriation by an extremist regime. In all three societies, economic success was seen as a necessary condition for the sustainability of the regime and for the survival of the capitalist way of life. As Wade points out in reference to Korea and Taiwan, "whereas the governments of most other developing countries know that they can fail economically and not risk invasion, the governments and elites of these countries knew that without fast economic growth and social stability this could well happen. This led them to make an unusually close coupling of national security and economic strength." 14

My reading of this evidence is that successful developmentalist strategies will be carried out by states that are sufficiently strong and autonomous to impose the social goal of development over the short-run interests of the private sector, yet also sufficiently oriented toward a development strategy in

<sup>14.</sup> Wade (1992, p. 314). This exact phrase could be used to describe Chile if "invasion" is replaced with "left-wing insurgency."

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which the private sector plays a central role. It is in that sense not surprising that the most successful development experiences of the postwar era involve the three societies that survived the strongest threat of the imposition of a communist regime.

Does the Salvadoran state fit this criterion? The fact that it arises from the prolonged civil war against a left-wing armed insurgency would seem to indicate that it does. Yet the genesis of the Nationalist Republican Alliance (ARENA) is quite different from that of the military regimes cited above, with a much stronger role played by traditional economic families in its constitution and definition of basic goals. The evidence regarding the lack of provision of basic public goods in the postwar period is not encouraging, in that it does not seem to signal a state that is intent on a developmentalist goal. Perhaps recent political developments in the country and in the region will spur elites into allowing the emergence of a state that is sufficiently strong and autonomous to stave off the challenge of the left. In my view, only such a state is capable of seriously carrying out proposals like those put forward by Hausmann and Rodrik.

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