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# DEPENDENT GROWTH IN A CAPITAL-IMPORTING ECONOMY: THE CASE OF PUERTO RICO\*

*By* BERNARD WASOW

## **Abstract**

LIKE most less developed capitalist economies, Puerto Rico has relied heavily on external capital. The long-run implications of externally financed growth are explored for Puerto Rico under alternative assumptions about domestic saving behaviour; the extent of external ownership and the gap between production and income are projected. The 1950–70 pattern of growth implied that eventually about 25 per cent of GDP would be repatriated and 90 per cent or more of the capital stock would be externally owned. Recent events suggest that this pattern will be difficult to sustain.

## **Introduction: external dependence and growth**

External capital—private investment and external borrowing—has enabled many countries to sustain investment rates substantially in excess of internal saving rates. Even in the United States, where capital inflows were on the whole small relative to investment, key sectors such as the railroads depended heavily on external finance, most of it British (Nurkse, 1954). In other economies—Canada, Australia, Norway—capital imports have for long periods amounted to 30 to 40 per cent of gross investment (Kuznets, 1961).<sup>1</sup> More recently, rapid post-war growth in Taiwan, Korea, and other less developed countries initially was financed in large part by capital inflows and transfer payments. Other economies have combined heavy dependence with slow growth. Dependence on external finance is the rule in capitalist development (see Chenery and Syrquin, 1975, on normal levels of such dependence). This situation has intensified in the last several years as a result of the ‘energy crisis’.

In spite of the central role of capital inflows in determining economic behaviour in a developing economy, macroeconomic models of less developed countries typically treat capital inflows, or some component of them, as a residual to be determined by behaviour elsewhere in the system.

\* Some of the work for this paper was undertaken when I was on the staff of the Committee to Study Puerto Rico's Finances. The work is solely mine, however, and should not be taken to represent the views of any other person or institution. I am grateful to Richard Porter for helpful comments.

<sup>1</sup> Even Japan borrowed externally funds amounting to 15–30 per cent of gross investment for extended periods, particularly from 1896 to 1913.

Often, as in two-gap models, requirements for external finance are projected. But the consequences of constraints on capital inflows are not easy to explore in such models because the behavioural structure within the economy is given independently of capital inflows. Thus, while Chenery (1970) says that 'to a large extent, the level of imports adapts to the availability of foreign exchange', two-gap models generally make imports a function of domestic demand alone. While transitory shortfalls in foreign exchange may be made up by extra borrowing—permitting import and investment plans to be realized—the longer-run behaviour within an economy surely must adapt itself, as Chenery suggests, to the availability of external resources. Most growth models do not account for the effects of capital inflows on saving and import behaviour.

Failure adequately to incorporate international capital flows in internal behaviour is not the only problem of macroeconomic development models. Few discussions treat properly the behaviour of factor income payments to the rest of the world. These should be treated as a return on earlier capital flows. Interest payments and profits on external investment are often disregarded within the formal structure of the model, or made independent of capital flows.<sup>1</sup> Thus, fundamental problems of external dependence and debt service cannot be analysed adequately in many macroeconomic models for less developed countries.

In this paper, I present a simple macroeconomic projection framework for Puerto Rico. It represents an attempt to simplify in the proper direction: in the model external financial flows largely determine the behaviour of the real system, rather than the reverse. Capital flows are projected and real behaviour is made to accommodate. The effect of capital flows on domestic saving is introduced. The import–export and saving–investment gaps are assumed to adjust to financial flows. Puerto Rico, as a region in the larger U.S. trade and monetary system, cannot have a trade gap different from its saving gap (though an over-determined model of Puerto Rico could generate more than one gap). Saving and investment, and imports and exports, must adjust to capital flows.

The framework is very simple. But perhaps it sheds light on the central mechanism of the Puerto Rican 'miracle', and reveals structural problems which may become increasingly severe in the future, even if the growth pattern of the 1950s and 1960s can be re-established. The method of analysis

<sup>1</sup> For example, a medium-sized econometric model of Puerto Rico by Dutta and Su, 1969, specifies export and import behaviour functions which implicitly place no constraint on capital inflows from the rest of the world. Gross outflow of factor income in that model depends exclusively on GNP (not GDP). The model also implicitly determines gross factor income inflows to Puerto Rico as a residual, since GNP, GDP, and gross factor income outflows are all explicitly determined. While these assumptions may be adequate for short-run projections, they are of dubious value for longer-run analysis.

could also be expanded by elaboration of production, saving, and capital flow behaviour, to make it more useful for analysis of proximate policy options.

### Dependent growth: long-run implications

The economics of growth in a capital-importing nation or region has been investigated a number of times. None of these studies sets out in simple terms, however, the extensions to a basic Harrod–Domar model needed for such analysis. Either capital flows are considered in isolation from production, or the analysis is unnecessarily complicated.<sup>1</sup> Nor do some analyses introduce the elementary distinction between GNP and GDP, which is necessary in the context of such discussions.<sup>2</sup> Let us, then, first set out the simple extensions of a Harrod–Domar model needed to incorporate international capital flows, consider some economic results of dependence on such flows, and then apply the framework to Puerto Rico.

### The framework

Output in this economy is the Domestic Product ( $Q$ ); National Product ( $Y$ ) is Domestic Product less the return to externally owned capital ( $\theta$ ).

$$Y = Q - \theta. \quad (1)$$

Changes in output are determined by net investment.<sup>3</sup>

$$\dot{Q} = vI. \quad (2)$$

Investment in turn is equal to domestic saving ( $S_d$ ) augmented by external net capital inflow ( $F$ ). Domestic saving is an increasing function of National

<sup>1</sup> Domar, 1957, analyses the capital flows from the exporting region's viewpoint. He does not consider production, however. Borts and Kopecky's, 1972, model is similar in some ways to the one developed here. They initially assume, rather than derive, the steady state, however, and then derive one of its properties (the ratio of GNP to GDP). They later derive the steady state from an unnecessarily awkward set of assumptions. They have little to say about the economy outside the steady state. The model presented here contains Domar's and Borts and Kopecky's conclusions, as well as several others. It also permits more complete analysis of saving behaviour and of the approach to the steady state.

<sup>2</sup> Recently Grinols and Bhagwati, 1976, have analysed the dynamic implications of 'aid' when it influences saving behaviour. Their analysis fails to consider interest payment outflows: no distinction between GNP and GDP is introduced. Furthermore, they confine the analysis to the case of a constant level of aid.

<sup>3</sup> While output growth depends on more than capital accumulation, the assumption that the labour supply is not an important separate constraint on growth, under current institutional arrangements in Puerto Rico, appears to be a good first approximation. Workers are free to migrate to the mainland United States, and indeed a massive pool of potential returnees has left Puerto Rico for the mainland to seek work. The rate and direction of the net migration flow has proved very sensitive to relative employment opportunities in Puerto Rico and in the U.S. (U.S. Dept. of Labor, 1975). Thus, the official island unemployment rate—which has never been below 10 per cent in spite of low participation rates—understates the pool of potential workers.

Product but a decreasing function of external net capital inflows.

$$I = S_a + F \quad (3)$$

$$S_a = S_0 + s_1 Y + s_2 F \quad s_1 > 0 \quad s_2 < 0. \quad (4)$$

Thus, while external capital is added to domestic saving to provide resources for investment, it at the same time reduces the domestic saving effort.

The existence of negative correlation between capital inflows and domestic saving is rather well established (see Papanek, 1972, for a summary of some of the evidence). The direction of causality in this relationship is disputed, however, with Papanek in particular believing that grants and loans may be issued in response to need, while most authors have treated 'aid' as autonomous, with domestic saving effort reduced by its availability. There is no reason, of course, to assume that the capital flow aggregate cannot contain autonomous as well as compensatory elements, and that aggregate saving behaviour cannot similarly be both cause and effect of capital flows. The empirical discrimination between such flows is, however, notoriously difficult.

In the case of Puerto Rico, one suspects strongly that capital flows and transfer payments from the United States reduce domestic saving.<sup>1</sup> Government budgeting is very closely geared to the availability of matching grants from the United States government. Also, the ready accessibility of the huge United States capital market has reduced the effort to develop an investable surplus internally. Business saving may have been reduced as well by the reportedly common practice by large United States based firms of acquiring successful Puerto Rican owned enterprises. Not only are the retained earnings of these firms thus removed from the GNP, but more fundamentally the development of a dynamic class of Puerto Rican capitalist-entrepreneurs may thereby be thwarted. Finally, personal saving is surely depressed by Puerto Rico's participation in United States' old age social security system. Benefit levels geared to an economy with three times the *per capita* GNP level of Puerto Rico have resulted in a substantial net inflow of transfer payments in recent years which promises to grow much larger in the future, depressing 'life-cycle' saving. North American consumption habits, in general, have no doubt further reduced the level of personal saving. 'Windfall' transfer payments, such as veterans' benefits (which bulge after each United States' war), may also stimulate the purchase of consumer durables on hire-purchase, a popular arrangement in Puerto Rico. On the other hand, some borrowing (most of it after 1970,

<sup>1</sup> In all the empirical work below, unilateral transfers are treated in the same way as current income from production, and are included in domestic saving. The negative effects of capital inflow on domestic saving in this work cannot therefore come, as Papanek proposes, from consumption of grants. The grant element of interest-bearing capital flows has not been estimated, however.

however) has been undertaken by the public sector in response to unanticipated revenue shortfalls. In this case, causality appears to run from unanticipated saving shortfalls to capital markets, rather than from capital inflows to reduction of the saving effort.

The empirical work which follows considers upper and lower limits to the causal effect of capital inflows on domestic saving: equation (4) is estimated both with  $s_2 \equiv 0$ —with domestic saving assumed to be unaffected by capital flows—and with the  $s_2$  arising from saving regressions in which  $F$  is treated as an independent variable. Thus the estimates permit delineation of bounds to the long-run growth and dependence patterns of Puerto Rico.

Capital inflow not only provides resources for investment, and affects saving behaviour, it also receives a return. The change in the income of externally owned capital is the rate of interest or return ( $i$ ) times the net capital inflow.

$$\dot{\theta} = iF. \tag{5}$$

The change in National Product, then, is simply

$$\dot{Y} = \dot{Q} - \dot{\theta} = vI - iF = v(S_0 + s_1Y) + [v(1 + s_2) - i]F. \tag{6}$$

And the change in investment is

$$\dot{I} = s_1\dot{Y} + (1 + s_2)\dot{F} = s_1[v(S_0 + s_1Y) + \{v(1 + s_2) - i\}F] + (1 + s_2)\dot{F}. \tag{7}$$

Dividing by  $I$  and simplifying gives the growth rate of investment:

$$g_I = s_1(v - di) + (1 + s_2)d g_F. \tag{8}$$

Here  $d$  is the ratio of the net capital inflow to investment. I call this variable the *dependency ratio*.

Let us now consider the economy which cannot import as much (or as little) capital as it might wish; in this economy  $g_F$  (the growth rate of net capital inflow) is given exogenously.<sup>1</sup> What will be the pattern of growth and dependence which develops in the borrowing economy? This question is easily answered by looking at the time path of the dependency ratio and then analysing the long-run steady state. Since the dependency ratio grows at the rate  $g_F - g_I$ , we can write

$$g_d = g_F - g_I = g_F\{1 - (1 + s_2)d\} - s_1(v - di) \tag{9}$$

or, multiplying by  $d$  and rearranging,

$$\dot{d} = d^2\{s_1i - g_F(1 + s_2)\} + d(g_F - s_1v). \tag{10}$$

<sup>1</sup> Alternatively, the growth of *gross* capital inflows could have been given. This would simply have cluttered the presentation. In the long run the rate of growth of net capital inflow would in any case converge to the rate of gross inflow if we assume a constant fraction of the debt is amortized each period.

This differential equation has the following solution:<sup>1</sup>

$$d = \frac{b}{2a} \left[ \frac{1 + Ae^{bt}}{1 - Ae^{bt}} - 1 \right] \tag{11}$$

where  $a = s_1i - g_F(1 + s_2)$ ;  $b = g_F - s_1v$ , and

$$A = \frac{d(0)}{d(0) + b/a}.$$

What happens to dependence in the long run? There are two cases. If  $g_F < s_1v$ , the growth rate is constrained in the long run by internal saving. As  $t \rightarrow \infty$ ,  $d \rightarrow (b/2a)[(1/1) - 1] = 0$ . The dependency ratio goes to zero and the system grows at the rate  $s_1v$ .

If  $g_F > s_1v$ , the growth rate is constrained in the long run by the growth rate of external capital inflows. In this case, as  $t \rightarrow \infty$ ,

$$d \rightarrow \frac{b}{2a} \left[ \left( \frac{A}{-A} \right) - 1 \right] = -b/a.$$

That is, in the steady state,

$$d = \frac{g_F - s_1v}{g_F(1 + s_2) - s_1i}. \tag{12}$$

The economy grows asymptotically at the rate  $g_F$ , in this case.<sup>2</sup>

In the long run, then, either the saving constraint will be binding and dependency will steadily diminish, or the rate of capital inflow will be binding and the dependency ratio will converge to a steady state level.

### The dependent economy

It is interesting to note some features of the economy in which  $g_F > s_1v$ , that is, which converges to a non-zero level of dependence. First, consider the ratio of output to income in this economy. Since in the steady state  $Y/Q = \dot{Y}/\dot{Q}$ , we can write

$$Y/Q = (\dot{Q} - \dot{\theta})/\dot{Q} = 1 - (iF/vI) = 1 - (i/v)d. \tag{13}$$

The expression  $(i/v)d$  is the fraction of GDP used to pay returns on external capital. If external capital receives a 10 per cent return, the output capital

<sup>1</sup> Equation (11) permits easy analysis of policy issues involving target dates for reduction of  $d$ , with implications for saving policy and for  $G_F$  growth. For example, given  $d(0)$ ,  $v$ ,  $i$ ,  $g_F$ , and saving behaviour, then the path of the dependency ratio is simple to calculate from (11).

<sup>2</sup> It is easy to see that the entire system will grow at a uniform rate in the long run. From Equation (6) it is clear that  $g_y = (S_0v/Y) + s_1v + \{v(1 + s_2) - i\}F/Y$ . Since

$$F/Y \equiv s_1d\{1 - d(1 + s_2)\}\{1 + (S_0/s_1Y)\},$$

we can write  $g_y = (S_0v/Y) + s_1v + \{v(1 + s_2) - i\}s_1d\{1 - d(1 + s_2)\}\{1 + (S_0/s_1Y)\}$ .

Substituting into this expression the steady state values of  $d$  from above, and noting that  $S_0/Y \rightarrow 0$ , we find that  $g_y = s_1v$  or  $g_F$ , depending on which constraint is binding.

GNP growth rates in the shorter run can be found as well, using the values of  $d$  from Equation (11). Analysis for  $I$  and  $Q$  is similar.

ratio is 0.3, and the dependency rate is 33 per cent,<sup>1</sup> then 11 per cent of GDP will be repatriated to external owners.

How does this outflow of resources compare with the capital inflow? This question is interesting because the ratio of profit outflow to investment inflow is often cited as a measure of the net contribution of external capital to growth.<sup>2</sup> Such an assertion is wrong: the ratio says no more about the net contribution to an economy by external capital than the ratio of interest payments to new deposits says about the contribution to a bank by depositors. Given its internal growth parameters,  $s_1$ ,  $s_2$ , and  $v$ , the dependent economy grows faster and has a higher GNP as a result of external capital inflows as long as  $v(1+s_2) > i$ .<sup>3</sup> Nevertheless, it is quite possible for payments to external owners to exceed the net capital inflow. In the steady state,

$$\theta/F = \dot{\theta}/\dot{F} = iF/\dot{F} = i/g_F. \quad (14)$$

Using this expression with numbers from the earlier example,  $g_F = 4$  per cent,  $i = 10$  per cent, payments to external owners are two and a half times as large as net capital inflows, in the steady state.

It is clear from the above example why citizens of the dependent economy might view these conditions with bitterness and why nationalization would be tempting in spite of the fact that GNP has been increased by the capital inflow. It must be noted that nationalization unaccompanied by policy to raise  $s_1$  and/or  $v$  will generally lead to slower long-run growth, as the economy moves to an internally constrained path. The immediate effects of nationalization, though, will be to increase domestic uses of resources as long as GDP can be maintained, since the captured stream of factor payments,  $\theta$ , is larger than the presumably forfeited stream of new external investment,  $F$ .

It is further interesting to note that the steady state dependency ratio can exceed unity if domestic saving is depressed by capital inflows. The condition for this to happen,

$$-\frac{s_2}{s_1} > \frac{v-i}{g_F},$$

can occur even when  $v(1+s_2) > i$ , which is to say even when the capital inflow is beneficial to GNP.<sup>4</sup> The steady state in this case is characterized by negative net internal saving. Whether lenders would continue to supply

<sup>1</sup> Through, say, saving rates  $s_1 = 0.1$ ,  $s_2 = 0$  and an external growth rate of 4 per cent. See expression (12).

<sup>2</sup> See, for example, Jalée, 1968.

<sup>3</sup> From Equation (6)  $d\dot{Y}/dF > 0$  if  $v(1+s_2) > i$ . This is true in the short run or in the steady state.

<sup>4</sup> If domestic saving is not affected by capital inflows—if  $s_2 = 0$ —then the steady state dependency ratio can exceed one only if the capital inflow costs more output than it produces, that is, if  $v < i$ .



capital, on the terms and at the rates embodied in the parameters  $i$  and  $g_F$ , as internal saving deteriorated and the debt/income ratio rose, is open to question. This question turns out to be directly relevant to Puerto Rican economic growth.

### The economy of Puerto Rico

Puerto Rican economic policy for the past quarter century has aimed at industrialization financed by external capital. This policy has been spectacularly successful in attracting investment, creating many jobs, and generally in raising many people's income. It has not created enough jobs

TABLE I  
*The macroeconomic structure of Puerto Rico, 1950-74*

Per cent of current GNP

		1950	1960	1970	1974
Gross National Product	GNP	754 <sup>a</sup>	1676 <sup>a</sup>	4622 <sup>a</sup>	6706 <sup>a</sup>
Gross Domestic Product	GDP	96	101	108	115
Private consumption	$C$	88	83	80	83
Public consumption	$G$	11	13	17	21
	$C+G$	99	96	97	104
Gross investment	$I$	15	24	31	27
Net imports <sup>b</sup>	$M-X$	14	20	28	31
Net unilateral transfers	$U$	10	7	8	11
Net direct investment	$DI$	1	5	9	12
Net long-term public borrowing	$B_g$	4	6	4	6
Net other capital	$N$	-1	2	7	2

<sup>a</sup> Hundred million current dollars of GNP.

<sup>b</sup> Net imports include factor income.

SOURCE: Planning Board of Puerto Rico.

for the population, however, nor has it led to the replacement of external capital by Puerto Rican saving. Yet, from the early 1950s until 1970, the pattern of growth was quite stable. Table I, above, shows the basic macroeconomic structure of the island. As can be seen, capital imports have grown from 4 per cent of GNP in 1950 to 20 per cent in 1974. As can also be seen, internal saving has deteriorated sharply recently; current uses of resources now exceed GNP.

Until recently, the limits to external borrowing and the problems of attracting direct investment were not widely appreciated. The economic difficulties of recent years have made very clear just how dependent Puerto Rico is on external capital. Using the framework developed above, we will examine the long-run implications of the trends of 1950-70.

## Long-run trends of the Puerto Rican economy

In spite of major shifts in industrial structure and rapid growth of income, the basic parameters considered above have been remarkably stable in Puerto Rico. There have been some changes and trends, of course: the incremental output/capital ratio rose in the late fifties and has fallen slowly since; the saving ratio moved downward sharply in the early

TABLE II  
*Implications of long-run trends in Puerto Rico*

	<i>Model I</i>	<i>Model II</i>
Parameters: (1) $g_F$	14.1%	14.1%
(2) $v$	0.40	0.40
(3) $i$	9.3%	9.3%
(4) $s_1$	4.3% (5.1%) <sup>a</sup>	14.3%
(5) $s_2$		-41.3%
Steady state: (6) $d$	0.90 (0.89) <sup>a</sup>	1.21
(7) GNP/GDP	0.79 (0.79) <sup>a</sup>	0.72
(8) $\theta/F$	0.66	0.66
(9) $g$ independent	1.7% (2.0%) <sup>a</sup>	5.7%

<sup>a</sup> The figures in parentheses result when  $s_1$  is estimated without an intercept. The intercept is statistically insignificant. See the appendix.

The definitions of rows are as follows (sources of estimates are given in the appendix): (1) growth rate of real net capital inflows; (2) incremental output/capital ratio; (3) real rate of return on net capital inflows; (4) marginal domestic saving rate from  $NNP + \text{unilateral transfers}$ ; (5) marginal domestic saving effect of net capital inflows; (6) dependency ratio: the ratio of net external debt to the capital stock; (7) ratio of GNP to GDP; (8) ratio of factor income outflow to net capital inflow; (9) GNP growth rate, assuming  $F = 0$ , with  $v$  and  $s_1$  unchanged.

1970s; the aggregate real interest rate has varied with the changing composition of capital inflows. But the long-term implications of the growth pattern changed little over the period.

Table II presents the relevant structural parameters for the 1950–70 period and their implications for the long run.<sup>1</sup> On the right is the model in which domestic saving is affected by capital inflows. On the left is the model in which domestic saving depends exclusively on  $NNP + U$ .

Both models imply very high levels of net external ownership in the long run. The lower estimate, assuming no adverse domestic saving effect, still places the level of external ownership at 90 per cent; with saving reduced by capital inflows, the external debt would eventually exceed the capital stock, and the flow of net borrowing would exceed the level of

<sup>1</sup> In 1974 Dr. Richard Porter, working for the Committee to Study Puerto Rico's Finances, estimated that the external debt was about 55 per cent of the capital stock.

investment. Even the lower estimate implies that the level of capital inflow will rise to 40 per cent of GNP; the higher estimate implies an eventual capital inflow almost 60 per cent as large as GNP.

Both models imply, however, that the capital inflow has indeed accelerated economic growth in Puerto Rico. Model I implies that each dollar of net capital inflow produces a stream of about 40 cents per year in value added, of which about nine to ten cents per year returns to external creditors, leaving about 30 cents as income for Puerto Rico residents. If U.S. capital displaces Puerto Rican saving, the net return is substantially reduced, but still positive. From Model II, the dollar inflow reduces Puerto Rican saving by about 40 cents, reducing GNP by about 16 cents; the net contribution of a dollar capital inflow to GNP in Model II is about 14 cents, roughly half of the net benefit from Model I.<sup>1</sup>

The two assumptions about saving, which yield generally similar projections of long-run behaviour of the Puerto Rican economy, give sharply divergent projections (in row 9 of Table II) of growth in the absence of capital inflows. Since the adverse effect of capital inflows on domestic saving would no longer dampen the domestic propensity to save, growth in Model II would proceed at a rate (5.7 per cent) considerably above that predicted by Model I (2 per cent). To the extent that saving is reduced by capital inflow, a model which neglects to specify this overestimates the benefit of the inflow, and underestimates both the eventual state of dependence and the capacity of the Puerto Rican economy to grow without capital inflows.<sup>2</sup>

### Recent departures from historical trends

In the long run, as we have just seen, Puerto Rico's pattern of growth has implied a high degree of external ownership and substantial gaps between production and national income. Recently the dependence of the economy has increased sharply as Table III illustrates. The average domestic net saving rate fell from 6.6 per cent in 1966 to 4.3 per cent in 1969 to 1.7 per cent in 1972 and to -1.3 per cent in 1974.

One is tempted to interpret this pattern as the behaviour predicted for the long run by the calculations based on Model II. However, more careful examination of the data suggests that the decline is not only far more rapid than one would expect, but that it is rooted in changes in behaviour, principally of the public sector.

In response to lagging private direct investment inflows in the early 1970s, the government of Puerto Rico expanded public consumption at a very rapid rate, relying heavily on external borrowing to finance its total

<sup>1</sup> The net contribution of capital inflow to GNP is simply  $v-i$  in Model I, and  $v(1+s_2)-i$  in Model II.

<sup>2</sup> Conversely, if causality is misspecified in the saving function, the opposite errors result.

budget. The level of economic activity was being buoyed by spending and borrowing which was not aimed at long-run growth, i.e. spending was not generally for planned public investments. This pattern was unsustainable: growth and debt servicing capacity requires productive investment.

TABLE III  
*Recent values of growth parameters in Puerto Rico*  
1969-74<sup>a</sup>

<i>Parameters</i>	<i>Value 1969-74</i>
$g_F$	10.8%
$v$	0.31%
$i$	10.5%
$s$	1.6%

<sup>a</sup> See the appendix for sources of estimates.

When the state and municipal bond market—suddenly disrupted by New York City's financial problems—began to reassess Puerto Rico's position, severe structural dislocations had already occurred. The public current budget was too large; the share of public consumption in GNP, which grew from 11.4 per cent in 1949 to 15.4 per cent in 1969, grew to 21.4 per cent over the next four years. Short-term goals of job creation in the public sector had displaced longer-term goals of promoting sustainable growth. Underwriters became reluctant to market new public debt issues for Puerto Rico and a rate spread of several percentage points above other issues developed in 1974 and 1975 for Puerto Rican debt issues. It became clear that the pattern of saving and investment of the early 1970s could not continue, and in 1975 austerity measures were imposed. One must question, however, whether long-run extrapolation of even the earlier pattern would not have led to similar crises of confidence among lenders as the debt/income ratio continued to grow.<sup>1</sup>

A key to re-establishing a sustainable growth path must be the re-establishment of internal saving. Perhaps Puerto Rico will adopt policies which will not simply aim to return the economy to its earlier long-run path, but which will aim to reduce dependence below that implied by the earlier path.

<sup>1</sup> Analysis by the Center for Capital Market Research of the University of Oregon, undertaken for the Committee to Study Puerto Rico's Finances, suggests that Puerto Rican public debt is considered rather homogeneous by the U.S. capital market, with little concern for different issuing agencies. The most important determinant of the rate spread between Puerto Rican and other state and municipal debt issues was the Puerto Rican debt/income ratio, although the recent increase in the rate spread cannot be explained using this variable or indeed any of a large number of economic variables. Subjective risk seems to have increased.

## Conclusions

Puerto Rico is a relatively extreme case of an increasingly widespread condition. Economies are finding that the rate—and the structure too—of investment and development are determined not so much by internal behavioural relationships and parameters as by the rate of inflow and the terms of external finance. Sources of finance do not simply fill gaps; they determine the shape of the economy. Finance permits, and may cause, gaps to develop.

Puerto Rico has in recent years been made to feel acutely this dependence. An attempt by the public sector in the early 1970s to make its real plans and then to seek finance has been sharply curtailed in the mid 1970s. The rapid and abortive rise of the public sector as the ‘engine of growth’—through borrowing to finance current expenditures—has left this sector far larger today than it has been historically, but without new programmes or institutions to contribute significantly to economic growth. The experience has left Puerto Rico more vulnerable than ever, more dependent and less capable of sustaining growth without capital inflows. To readjust the economy to earlier patterns will not be easy. Even this may not be satisfactory since even the earlier pattern implies very high levels of dependence in the long run. Only if the rate of saving is increased markedly, and if this saving is productively invested, can Puerto Rico hope to establish a pattern of growth which will lead to diminishing external dependence. Whether such structural changes are possible in the present institutional setting remains to be seen.

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## APPENDIX

Sources of estimates in Table II:

1.  $g_F$  is estimated from a log-linear trend regression. The GNP deflator is used on  $F$ .

$$2.* \quad v = \frac{\text{GDP}_{1970} - \text{GDP}_{1950}}{\sum_{1950}^{1969} I}$$

The GNP deflator is used for GDP and the investment deflator is used for  $I$ , net investment.

$$3.* \quad i = \frac{\theta_{1970} - \theta_{1950}}{\sum_{1950}^{1969} F}$$

$\theta$ , the net outflow of factor income, is deflated with the GNP deflator.

\* It might be noted that estimating  $v$  and  $i$  as I have done is equivalent to a weighted average using the shares of total  $I$  and total  $F$  respectively as weights.

<p>4.** <math>S_d = 14.845 + 0.043(NNP + U)</math>                    (1.08)†   (5.47)</p> <p><math>S_d = 0.051(NNP + U)</math>                    (19.41)</p>	<p><math>R^2 = 0.61</math>  <math>D - W = 1.41</math></p> <p><math>R^2 = 0.59</math>  <math>D - W = 1.32</math></p>
<p>5.** <math>S_d = -64.403 + 0.143(NNP + U) - 0.413F</math>                    (-3.30)   (6.47)                   (-4.66)</p>	<p><math>R^2 = 0.82</math>  <math>D - W = 1.78</math></p>

In Table III the same methods were used except in estimating the saving rate. Since only six observations were involved, it seemed pointless to estimate equation (5) above, retaining only three degrees of freedom. The saving rate,  $s_1$ , was estimated simply by averaging the annual saving rates. (The weighted average, using GNP as the weight, is 1.2%.)

\*\*  $S_d$  includes  $U$ , unilateral transfers (that is,  $S_d = NNP + U - C - G$ ), as does the independent variable  $NNP + U$ .  $F$  includes only capital flows. All variables were deflated using the GNP deflator.

†  $t$  statistics are in parentheses. There were twenty-one observations.

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