IMF Working Paper

The Fall and Recovery of the Cuban Economy in the 1990s: Mirage or Reality?

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INTERNATIONAL MONETARY FUND

IMF Working Paper

African Department

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April 2001

Abstract

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The collapse of the Cuban economy following the cessation of Soviet assistance gave way to a strong recovery in 1994-96. There are three possible explanations for this recovery: (i) that it never took place; (ii) that it reflected a surge in productivity resulting from stabilization and liberalization in 1993-94; or (iii) that it resulted from a favorable aggregate demand shock. The second explanation—the most persuasive—suggests that a strong and durable expansion will probably not be achieved on the basis of present policies, but that the benefits of a full liberalization of the economy are likely to be considerable.

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[1] An earlier version of this paper was presented at the Annual Conference of the Association for the Study of the Cuban Economy, Miami, Florida, August 2000. The author is would like to thank Moshe Syrquin, Luis Locay, PhilipYoung and Ricardo Velloso for useful comments on a previous draft.

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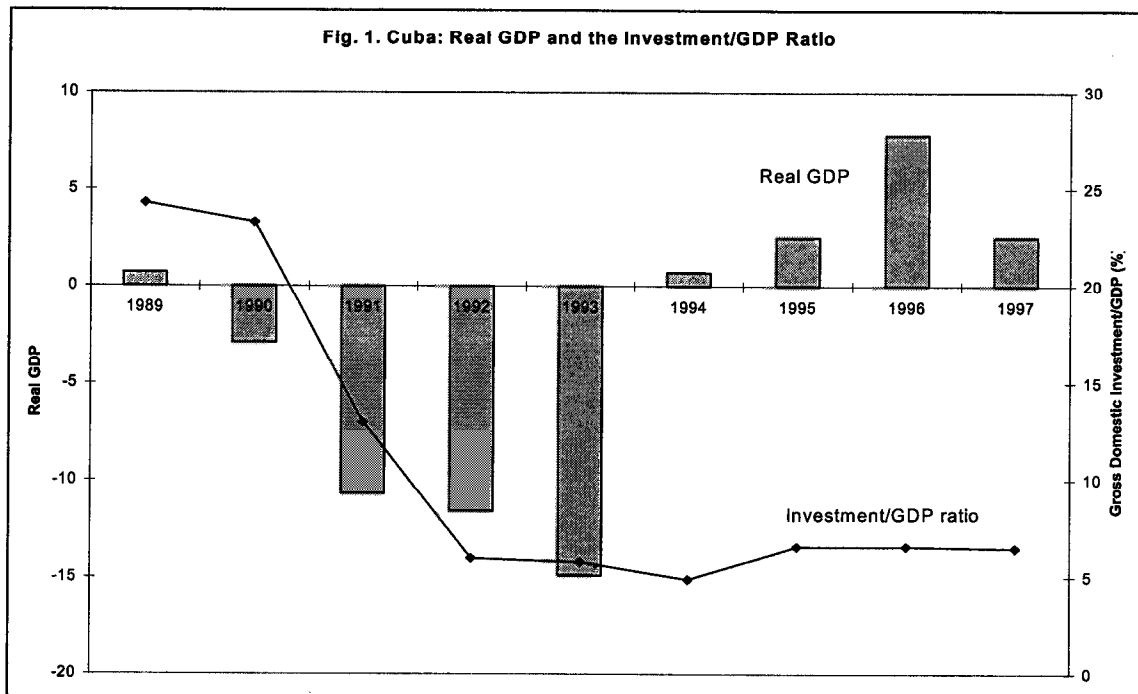
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I. OVERVIEW

The collapse of the Cuban economy in the early 1990's ended abruptly in 1994, gave way to a relatively strong recovery for a couple of years, and then to a period of positive, albeit modest, growth in 1997-98. At least that is the story the official numbers tell. As shown in Fig. 1, real GDP contracted at an average annual rate of 10 percent from 1990 to 1993, before rising at an average of almost 4 percent a year in the period 1994-1996.[2] Real GDP growth averaged less than 2 percent in 1997-98.

Can these movements be explained? It is easy to account for the economic contraction in 1990-93 on the basis of the collapse of domestic investment resulting from the cessation of Soviet assistance to Cuba, and the disruptions caused by the sharp fall in trade with Cuba's traditional trading partners in the defunct CMEA. At first sight, however, the sudden shift to positive growth in 1994-96 is more difficult to understand in view of the rough stability in the ratio of domestic investment to GDP during that period (see Fig. 1). The shift may also seem quite sudden in light of the experience of those transition economies of Eastern Europe and the former Soviet Union, and particularly of those where the implementation of structural reforms was slow and incomplete, as has been the case in Cuba.

This paper reviews macroeconomic developments in Cuba during the 1990's and seeks to explain the jagged pattern of growth in that period. The conventional growth accounting exercise presented in section 4, below, suggests that the fall and recovery of output growth in the 1990's cannot be fully attributed to the behavior of capital and labor inputs, and must be explained largely by movements in total factor productivity (TFP). The paper then examines the 1994-96 recovery on the basis of three alternative explanations: (i) that the numbers are not credible; (ii) that the 1994-96 recovery actually took place and reflected a surge in productivity resulting from the policies of macroeconomic stabilization and liberalization implemented in late 1993 and 1994; and (iii) that the recovery resulted from a favorable demand shock. The second explanation, which is consistent with both the improved performance in 1994-96 and with the fairly weak growth in 1997-98, appears to be the most convincing. The analysis also suggests that a strong and durable expansion is unlikely to be achieved in the period ahead on the basis of present policies, but that the benefits of a full liberalization of the economy are likely to be considerable.

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[2]These numbers are those provided by Perez Villanueva (1998) and the Cuban Central Bank (1999 and 2000), and differ somewhat from those published in CEPAL (2000).

Fig. 1. Cuba: Real GDP and the Investment/GDP Ratio

II. THE END OF SOVIET ASSISTANCE AND THE 1990-93 ECONOMIC COLLAPSE

For three decades, the Cuban economy had benefited from massive economic assistance by the Soviet Union. The assistance mainly took the form of heavily subsidized exchanges of Cuban sugar exports for imports of Soviet oil. In addition, Cuba obtained significant amounts of subsidized Soviet oil over and above its domestic consumption needs, that the Cuban government was allowed to sell at world market prices and to use the proceeds to finance hard currency imports. These non-repayable subsidies amounted to an annual average of US$2 billion in 1986-90. In the same period, the Soviet Union extended loans to Cuba averaging US$2.3 billion a year (Pérez-Lopez, 1998). Thus total Soviet assistance averaged US$4.3 billion in 1986-90, or 15 percent of Cuba's GDP if converted at the official rate of 1 peso per US$, and much more if converted at a market exchange rate.

Soviet assistance began to decline in 1989. Crumbling under the weight of budgetary problems (including the mounting external debt) and a fall in oil output, the Soviet Union under Gorbachev ended the subsidized exchange of Cuban sugar for Soviet oil and demanded payment in cash (see Alonso and Galliano, 1999). This forced Cuba to slash oil imports and buy whatever it could afford to buy in world markets, at much higher prices. What remained of Soviet assistance was slashed by the Russian Federation in 1992, and trade with the former Soviet block virtually disappeared.

Fig. 2b illustrates the dramatic effects of these events on Cuba's flow-of-funds accounts. The ratio of foreign saving to GDP peaked at more than 14 percent in 1989, fell to 12 percent in

1990 and then plunged to 1 percent in 1994. Gross national saving also fell in relation to GDP, from 11 percent in 1990 to less than 4 percent in 1994. As a result, the ratio of gross domestic investment to GDP collapsed from just over 23 percent of GDP in 1990 to 5 percent in 1994, as the country began to consume its stock of fixed capital and to run down inventories at a rapid pace.
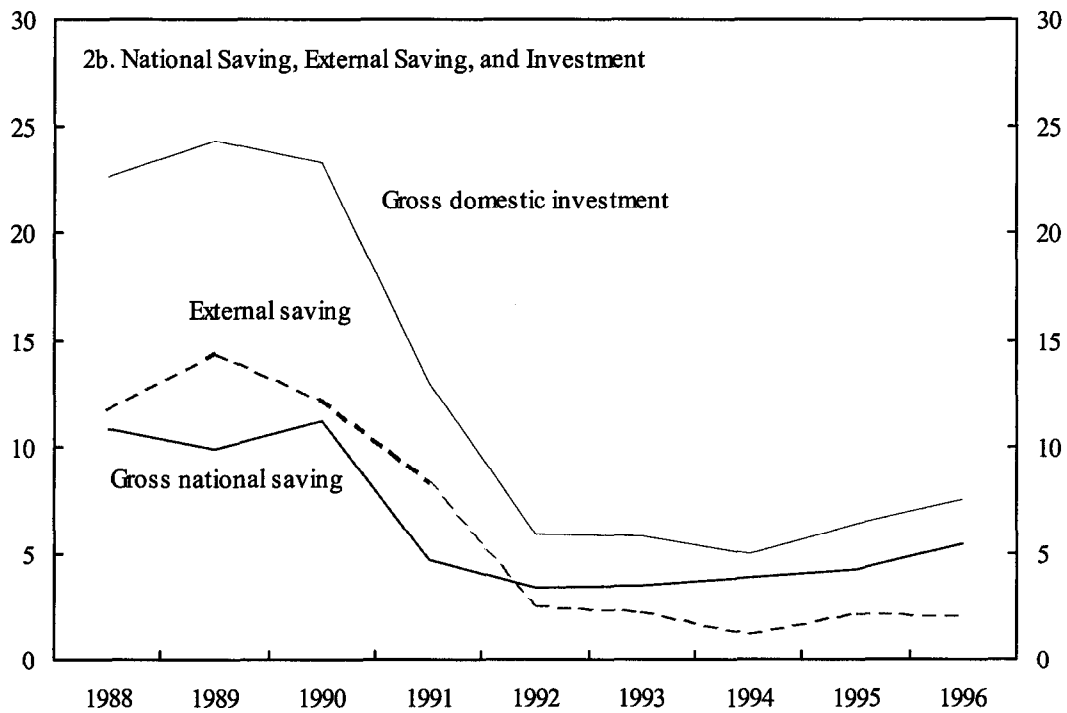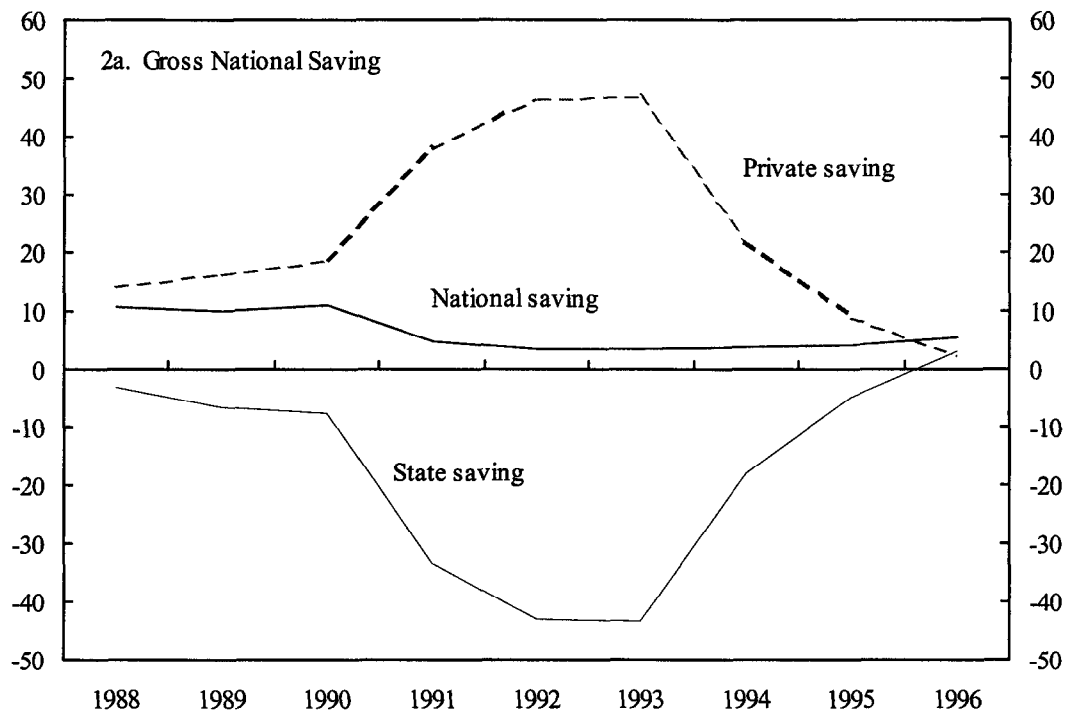
While the domestic saving ratio fell, its composition experienced a massive change. As shown in Fig. 2a, private saving surged in relation to GDP by almost 30 percentage points from 1990 to 1993, but this was more than offset by an extraordinary increase in the absorption of saving by the state sector. Both changes reflected the governments' adjustment policy during this period, which can be characterized as a policy of "adjustment by brute force." With fiscal revenue falling in response to the weakening of economic activity and foreign trade, the government sought to protect social spending. More importantly from a political standpoint, the government sought to keep unprofitable state enterprises afloat, thus avoiding a large contraction in state sector employment—but at the cost of a massive increase in subsidies (Tables 1 and 2). As a result, the state deficit widened from 9.4 percent of GDP in 1990 to 30.4 percent in 1993. Since Soviet financing—and the Soviet Union itself—were now things of the past, and since access to international borrowing on market terms was limited, much of these deficits had to be financed by issuing money[3].

With many prices still rigidly controlled well below market clearing-levels, the government in effect forced the population to hold monetary balances well in excess of desired levels. This growing monetary overhang was reflected in the (involuntary) surge in household saving (see Fig. 2a), and increasingly acute shortages of many goods in spite of a steep rundown in inventories. Not all prices were controlled, however. In particular, black markets for agricultural products, which had existed at various levels throughout most of the communist period, were now expanding. Therefore, monetary financing of the deficit was also reflected in a rise in inflation. The rate of increase in the GDP deflator rose from 3.4 percent in 1990 to 17.4 percent in 1993 (in spite of widespread price controls), and inflation in informal and black markets surged from 2 percent in 1990 to more than 200 percent in 1993.

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[3] The full story of how the fiscal deficit was financed is still a bit of a mystery, however. As can be seen in Table 2, seignorage accounted for much, but by no means all, of the financing in the period 1989-97. Seignorage is measured as the ratio of the change in the money supply to GDP; the money supply is defined to include currency and peso-denominated saving deposits. There is no official explanation as to how the rest of the deficit was financed, but external borrowing, use of official reserves and state payments arrears may have been part of the story.

Fig. 2. Cuba: Saving and Investment
(In percent of GDP)

2a. Gross National Saving

Private saving

National saving

State saving

1988 1989 1990 1991 1992 1993 1994 1995 1996

2b. National Saving, External Saving, and Investment

Gross domestic investment

External saving

Gross national saving

1988 1989 1990 1991 1992 1993 1994 1995 1996

Table 1. Cuba: Changes in Fiscal and Monetary Indicators During Recession and Recovery		
(Percentage points*)		
1989-93	1993-96	1996-98
Revenue -2.8	-7.3	-1.7
Turnover and sales tax -4.8	-8.7	-0.4
Other 2.0	1.4	-1.3
Expenditure 20.8	-35.4	-1.8
Social area 6.0	-6.1	0.2
Defense & internal security -1.8	-2.3	0.1
Subsidies 20.4	-26.5	-0.6
Investment -2.4	-4.0	-2.2
Other -1.4	3.7	0.4
Deficit (increase -) -23.6	28.1	4.1
Money growth 12	-29	-0.3
Informal/free market prices 202	-230	...
GDP price deflator 14	-18	3.4

* Fiscal variables are changes in ratios to GDP; monetary and price variables are changes in annual rates of change.

In the labor market, the heavy subsidization of the state sector limited the drop in state employment to 3½ percent of the labor force, but this was partly offset by some employment growth in the private sector. The overall unemployment rate actually fell, as the decline in overall employment was more than offset by a 3 percent decline in the labor force that reflected a large outflow of discouraged workers (see Table 3). But the containment of unemployment came at a high price in terms of falling living standards for the population, including a severe intensification of rationing and frequent interruptions of electricity and water supply.

III. STABILIZATION AND RECOVERY: 1994-1996

The process of adjustment by brute force could not continue. The monetary overhang, shortages, and rationing queues were growing; inflation was threatening to get out of control; and economic activity was collapsing. Someone apparently succeeded in convincing president Castro that another method of adjustment had to be tried before the patience of the population was exhausted. While the long-term objective of the government remained the final triumph of socialism (see Hernández-Catá, 1999), a revised economic strategy was implemented beginning in late1993 as a tactical way out of the previous, failed adjustment policy.

Table 2. Cuba: Fiscal and Monetary Indicators

Fiscal position (% of GDP)	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Revenue	**60.1**	**58.7**	**62.4**	**56.5**	**57.3**	**62.6**	**56.6**	**50.0**	**49.5**	**48.3**
Turnover and sales taxes	24.7	24.0	22.7	24.2	19.9	16.5	13.1	11.2	10.4	10.8
Other indirect taxes	2.0	2.0	2.4	2.2	1.8	10.9	13.5	11.4	11.1	10.7
Foreign trade taxes	13.9	13.6	5.2	-1.0	0.0	0.0	0.0	0.0	0.0	0.0
Direct taxes	3.3	3.9	4.7	5.4	8.1	7.1	7.9	10.0	13.1	14.3
Other state entreprise receipts	9.1	6.7	8.1	9.7	10.4	10.9	7.6	8.3	5.9	5.6
Depreciation and asset sales	1.5	1.2	8.2	8.6	7.9	9.2	10.1	2.8	2.6	1.9
Other revenue	5.6	7.3	11.1	7.4	9.2	8.0	4.4	6.3	6.4	5.0
Expenditure	**66.9**	**68.1**	**83.8**	**86.3**	**87.7**	**69.6**	**60.0**	**52.3**	**51.3**	**50.5**
Social spending	17.5	17.9	20.9	22.6	23.5	19.3	17.6	17.4	17.6	17.6
Defense and internal security	6.1	5.5	5.0	4.5	4.3	3.2	2.6	2.0	2.6	2.1
Subsidies	16.7	18.9	26.9	34.1	37.1	20.4	12.0	10.6	9.1	10.0
Investment	14.7	13.8	20.7	14.4	12.3	13.2	7.6	8.3	7.5	6.1
Unclassified	11.9	12.0	10.3	10.7	10.5	13.9	20.3	14.2	14.3	14.6
Balance (deficit -)	**-6.8**	**-9.4**	**-21.4**	**-29.8**	**-30.4**	**-7.4**	**-3.5**	**-2.5**	**-2.0**	**-2.3**
Financing	**6.8**	**9.4**	**21.4**	**29.8**	**30.4**	**7.4**	**3.5**	**2.5**	**2.0**	**2.3**
Seignorage	1.4	3.9	9.6	10.4	17.8	-5.8	3.2	1.2	-0.4	1.1
Residual financing	5.4	5.5	11.8	19.4	12.6	13.2	0.3	1.3	2.4	1.2
Monetary and price indicators (Percentage changes)										
Money supply (peso M2)	...	19.8	33.6	25.5	32.1	-10.1	-6.9	3.1	-1.0	2.8
Informal/free market prices	2.5	2.1	158.0	93.6	204.5	-10.1	-47.0	-25.0	...	...
GDP deflator	1.8	3.4	-7.1	3.5	17.4	23.0	12.0	-0.9	-1.0	2.5
Consumer prices	...	...	...	...	...	...	-11.5	-4.9	1.9	2.9
Exchange rate (a)	...	...	-92.9	-196.3	-95.0	-21.8	66.2	40.2	-14.6	9.1

Sources: CEPAL (1997 and 2000) and Banco Central de Cuba (1999 and 2000)
Note: Data for the deficit are from Banco Central de Cuba (2000) and my differ slightly from the difference between revenue and expenditure which is based on data from CEPAL (2000).
(a) A negative sign indicates a depreciation of the peso against the U.S. dollar.

Table 3. Cuba: Flows Into and Out of the Labor Force

	(thousands)			(percent of the labor force)		
	1990-93	1994-96	1997-98	1990-93	1994-96	1997-98
Changes in the labor force	-131	-82	51	-2.9	-1.8	1.1
Due to changes in:						
Population of working age	471	121	-10	10.2	2.7	-0.2
Participation	-602	-203	61	-13.1	-4.5	1.3
Absorbed by changes in:						
State sector employment	-157	-569	-5	-3.4	-12.6	-0.1
Private sector employment	113	428	57	2.5	9.5	1.2
Unemployment	-87	58	0	-1.9	1.3	0.0

The new approach had two basic components: macroeconomic adjustment, and liberalization measures.[4] In the macro-policy area, decisive measures were taken to improve the fiscal position. Several tax measures could not arrest the decline in revenue. However, state expenditure fell steeply in all key sectors, including the social area, both in nominal terms and in relation to GDP. Most importantly, subsidies to enterprises, which had increased sharply during the crisis period, experienced a dramatic fall in 1994 and subsequent years. The result was an astounding drop in the fiscal deficit, from 30 percent of GDP in 1993 to 7 percent in 1994 and to 2 ½ percent in 1996. This made it possible to reduce the *level* of the money supply, which—together with the decontrol of prices outside the state sector—helped to reduce the monetary overhang. Monetary deflation also led to a large reduction of price *levels* in uncontrolled markets, and to an appreciable decline of inflation as measured by the GDP deflator (see tables 1 and 2). The level of the new consumer price index fell by 11 percent in 1995 while the GDP deflator rose by 12 percent, with the difference probably reflecting the large appreciation of the peso in that year (bottom of table 2).

These adjustment measures had a massive impact on the flows-of-funds. As shown in Fig. 2a, the huge and broadly offsetting increases in government dissaving and in forced private saving that had occurred during the crisis period were more than reversed, reflecting the fiscal adjustment and the decline in the monetary overhang. Total national saving rose from 1993 to 1996, particularly in the latter year when transfers from abroad[5] exceeded net interest payments abroad, while foreign saving stopped falling and stabilized at around 2 percent of GDP. As a result, the contraction in the ratio of domestic investment to GDP came to an end in 1994 and the ratio rose modestly in 1995-96.

Macroeconomic stabilization in the period 1994-95 was accompanied by several measures aimed at liberalizing partly certain sectors of the economy (see Box).[6] Owing largely to these measures, employment increased sharply in the private sector, almost offsetting massive layoffs in the state sector; the unemployment rate increased only by only 1.3 percent of the

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[4] The term "liberalization measures" is deliberately used instead of "structural reforms" to emphasize the tactical and potentially reversible nature of the measures.

[5] Transfers from abroad are calculated in part as the turnover in dollar shops minus dollar earnings accounted for by official incentive schemes (Morris, 2000). As such, these transfers are thought to represent predominantly, but not exclusively, remittances from Cubans residing in the United States, in the form of U.S. dollar bills. Transfers may also include remittances from Cuban residents working abroad (e.g., doctors and teachers), including in African countries. Net transfers from abroad minus net interest payments abroad accounts for the difference between national and domestic saving.

[6] For a fuller discussion of these liberalization measures, see Perez-Lopez (1995 and 1998).

labor force during 1994-96, and outflows of discouraged workers from the labor force diminished considerably in comparison with 1990-93.

Box. Key Liberalization Measures, 1993-96

- In the **agricultural sector**, Soviet-style state farms were converted into *basic cooperative production units* (*Unidades Basicas de Producción Cooperativa*, or UBPC's), which were granted 42 percent of the country's usable land. This was followed, in October 1994 by the legalization *"farmers markets"* where farm products (with some exceptions like meat, milk, and potatoes) could be sold at decontrolled prices. In 1997, an estimated 76 percent of the country's usable land was held by the non-state sector, mainly cooperatives.

- In a major policy shift, in the third quarter of 1993 the government de-criminalized both the **possession and the use of hard currency** by the population. Transfers of dollar bills from families abroad were also legalized, and travel by relatives of Cuban residents living abroad was made easier. Moreover, the government created special stores in which those able to pay in U.S. dollars could buy goods not available elsewhere. Finally, in October 1995 exchange bureaus were created and allowed to buy and sell hard currencies at close to black market rates.

- In September 1993 the government issued a decree legalizing **self-employment**. Legalization was subject to important restrictions,[1] however, and was subsequently turned on and off in certain sectors, notably private restaurants. Nevertheless, it helped to create jobs and to absorb employees fired from unprofitable state enterprises, thus avoiding what could have been a large rise in unemployment.

These liberalization measures were accompanied by efforts to restructure state enterprises with a view to improving their efficiency and reducing their reliance on state subsidies.

IV. GROWTH ACCOUNTING

Was all this sufficient to account for the turnaround in growth? Table 4 begins to examine this question on the basis of a simple growth accounting framework. The growth of real GDP during the period 1998-99 is broken down into three components: fixed capital formation,

labor force growth, and total factor productivity (TFP) growth.[7] It is clear from the table that both the fall in output in 1990-93 and its recovery beginning in 1994 reflected mostly changes in TFP. The contribution of fixed capital formation and the labor force is negligible for the period 1990-93 as a whole, although the contribution of fixed investment declines sharply within the period and becomes negative in 1992-93. In 1994-96, the net contribution of capital formation and labor force growth is negative, implying that the recovery of output during that period was more than accounted for by rapid growth in TFP.

Table 4. Cuba: Factors Accounting for Output Growth
(Percentage changes)

| Year | Real GDP growth | Contributions to the growth of real GDP from: | | |
		Fixed Capital formation	Growth of labor force	Growth of TFP
1988	3.6	4.0	0.5	-1.0
1989	0.7	3.8	0.3	-3.4
1990	-2.9	3.1	0.1	-6.2
1991	-10.7	1.2	-0.1	-11.8
1992	-11.6	-1.2	-1.1	-9.3
1993	-14.9	-2.1	-0.4	-12.4
1994	0.7	-2.7	-1.1	4.5
1995	2.5	-2.5	0.3	4.7
1996	7.8	-1.6	-0.1	9.5
1997	2.5	-1.6	1.0	3.1
1998	1.2	-1.5	0.4	2.3
period averages				
1990-93	-10.0	0.3	-0.3	-9.9
1994-96	3.7	-2.3	-0.3	6.2
1997-98	1.9	-1.6	0.7	2.7

In Table 4, TFP growth is calculated residually—i.e., by subtracting the contributions of fixed capital formation and labor force growth from the rate of change in real GDP—and is not cyclically adjusted. Therefore TFP growth reflects not only changes in all the technological and institutional factors that are not included in the measurement of capital and labor; but also changes in capacity utilization, i.e., in the difference between potential and actual output. On that basis, the drop in TFP in the period 1990-93 is not surprising given the disruptions (financial, commercial, and technical) associated with the end of Soviet assistance to Cuba, including the dramatic increase in the cost of imported oil. A flattening out of the *level* of TFP could have been expected in the subsequent period, given the once-and-for all nature of these shocks. But these shocks were also permanent, and therefore the huge turnaround from negative to positive growth of TFP in 1994 is much harder to explain.

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[7] The calculations underlying the exercise are discussed in Annex 1.

V. 1994-96: RECOVERY INDUCED BY LIBERALIZATION OR MIRAGE?

Is such a strong and sudden increase in productivity possible? If not, it casts doubt on the credibility of the official statistics, and this likely would show up in inconsistencies in the data. If the answer is positive, there should be some explanation for the upswing in output in 1994 and the return to positive growth in 1995-96. An explanation suggested by Betancourt (1999) is that the turnaround in economic performance reflected the beneficial supply side effects of liberalization on the growth of productivity and potential output. Another, less persuasive, explanation is that the upswing in 1994 reflected a rise in capacity utilization triggered by some exogenous increase in aggregate demand.

This section examines these possible explanations in turn. It does not claim to reach strong conclusions. The publicly available base of Cuban data is still limited, although for the period after 1989-98 the study of the UN's Economic Commission for Latin America (1997, updated in 2000) provides a large number of statistical series, many of them previously unpublished. Moreover, the Central Bank of Cuba in its annual reports now provides updates for key macroeconomic time series, including on the balance of payments (but not, for example, for labor market variables). The period for which a sufficient set of key data is available is too short to allow for a thorough statistical analysis of time series. Nevertheless, the available data suggest some possible answers.

Statistical consistency. The indicators of economic activity presented in the upper part of Table 5 point to a degree of consistency among several key variables. First, the growth of output is roughly in line with that of power consumption (lines 1 and 2.) On average, power consumption grew more rapidly—or fell less steeply—than real GDP. This pattern, which was observed in most countries of the former Soviet Union during the transition from plan to market, is often interpreted as a sign that the underground economy is growing. The reason is that official statistics underestimate output in the informal and illegal sectors of the economy, while power consumption is thought to be a good proxy for total (official and underground) economic activity.[8]

Another noteworthy result in table 5 is that total factor productivity, as derived from the growth accounting framework, is correlated with data on labor productivity growth in the industrial sector derived from official industry-by-industry data (lines 3 and 4). In particular,

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[8] Of course, other factors influence the growth differential between official GDP and power consumption, including changes in the relative price of energy, and the resulting changes in energy efficiency. These changes typically occur gradually, however, and they probably have relatively little influence on year-to-year movements in energy consumption. Energy shortages following the end of Soviet subsidies to Cuba could explain why power consumption fell more rapidly than GDP in 1992-93.

both productivity series show negative growth in 1990-93 and an upswing in 1994. The sharp recovery of industrial labor productivity in 1994, which reflects to a large extent labor shedding, was very broadly based across industrial sectors. The evolution of another measure of labor productivity, the ratio of real GDP to total employment, is also broadly similar to that of TFP. In sum, if there was a conspiracy to rig the numbers, someone appears to have gone to extraordinary lengths in order to establish consistency among the falsified numbers.

Liberalization as a source of productivity growth? The other variables in Table 5 illustrate the effects of labor market and price liberalization. As indicated in line 6, private employment grows throughout the period 1990-96 and surges in 1994, right after the measures liberalizing self-employment and private farming. The share of private to total employment also increases very rapidly beginning in 1994 (line 7). And the non-sate sector share of agricultural land also rises considerably from 1989 to 1994, with most of the change probably occurring in 1993-94 (line 8).

Assuming that productivity is generally higher in the private sector than in the public sector, the increase in the private employment share should involve a rise in the overall productivity of labor. In the context of the simple growth accounting framework of Table 4 (where labor is assumed to be homogenous and its productivity to be constant) this rise would show up as an increase in TFP growth. The assumption that productivity is higher in the non-state sector is confirmed by Alvarez' results for the agricultural sector. (2000). In the cases of sugar, tobacco, and a few other farm products, he finds that the yield differential in favor of the non-state sector averaged 11.4 percent in the period 1969-97. More generally, Alvarez finds that yields tend to rise as the share of the non-state sector increases, in spite of that sector's reduced access to factors of production.

Two proxies for the intensity of price controls (lines 9 and 10) show a widening gap between equilibrium prices and actual prices from 1990 to 1993, as inflation rises in black markets while price controls remain widespread, confirming anecdotal evidence of severe shortages and queues in controlled markets during that period.[9] From 1993 on, however, there is a large decline in both price control proxies, as inflationary pressures subside and prices are liberalized in some sectors—in about one fourth to one third of the economy, judging by the private sector's 1998 shares of both employment and household purchases, but probably more given the existence of a substantial and growing underground sector.

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[9]The two indexes are (i) the ratio of the Alonso-Lago (1995) index of prices in free and black market prices to the GDP deflator (line 8); and (ii) the ratio of the U.S. consumer price index converted into pesos at the parallel market exchange rate to the Cuban GDP deflator (line 9.)

Table 5. Cuba: Selected Indicators of Economic Activity and Liberalization
(percentage changes, unless otherwise noted)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 (e)
Economic Activity										
1. Real GDP	0.7	-2.9	-10.7	-11.6	-14.9	0.7	2.5	7.8	2.5	1.2
2. Real power consumption	4.1	-0.8	-13.1	-13.4	-7.3	6.9	2.4	7.2	7.0	1.2
3. Total factor productivity	-3.4	-6.2	-11.8	-9.3	-12.4	4.5	4.7	9.5	3.1	2.3
4. Labor productivity, industry (a)	...	-6.1	-24.0	-24.1	-9.0	21.4	14.4	14.7	5.8	8.4
5. Real GDP/total employment	...	-4.1	-15.5	-10.0	-14.6	0.0	9.0	6.8	0.3	-0.1
Indicators of liberalization										
6. Private employment	...	4.7	6.3	9.8	22.4	95.9	13.3	1.4	7.7	8.3
7. Non-state employment share (b)	5.6	5.8	6.2	6.9	8.6	19.0	22.3	22.7	24.0	26.1
8. Non-state agricultural land share (b)	22.0	...	...	...	...	73.6	74.3	74.5	75.6	...
Indicators of distortions										
9. Price control index (c)	1.0	1.0	2.7	5.1	13.3	9.8	4.7	3.6	...	...
10. Price control index (d)	1.0	1.0	2.6	4.5	11.6	16.7	6.1	3.5	4.0	3.8
11. M2/GDP (in percent)	20.0	23.9	38.0	51.0	73.2	51.8	42.6	41.8	41.1	40.6
12. State subsidies	21.0	13.2	42.3	26.8	8.8	-44.2	-35.3	-2.2	-8.4	-4.2

Sources: CEPAL (1997), Alonso and Lago (1995), Perez-Villanueva (1999), U.S. Department of Commerce, Banco Central de Cuba (1999) and author's estimates.

a Industrial output divided by industrial employment. Data from CEPAL (2000), exclude the sugar, fuel and electrical industries.
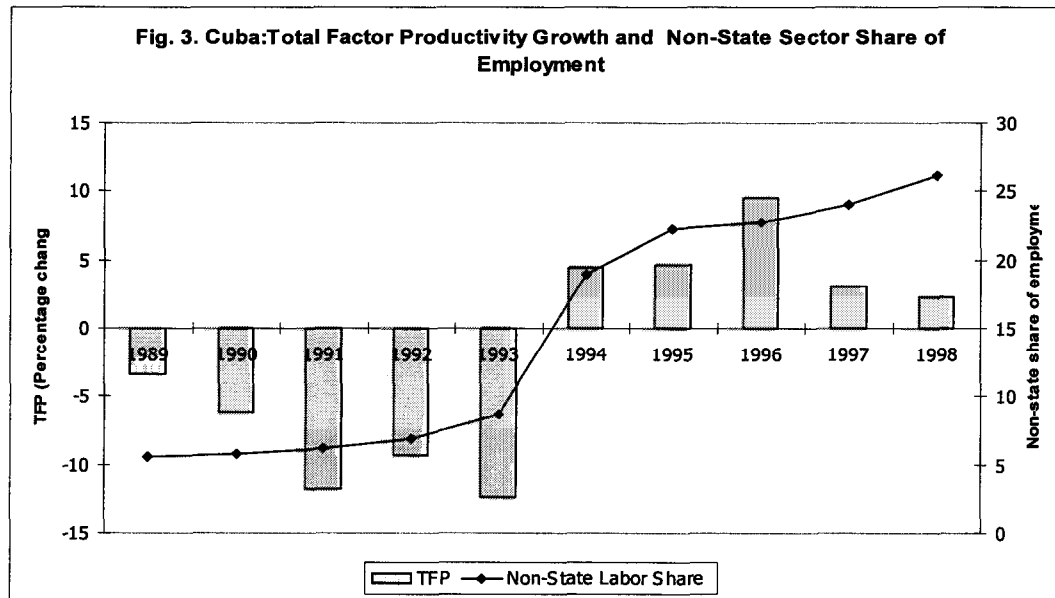b In percent of total employment
c Index of prices in informal markets divided by the GDP deflator (1998=100).
d Index of U.S consumer prices converted into pesos using the unofficial exchange rate, divided by the Cuban GDP deflator (1998=100).
e Preliminary

Line 11 shows the ratio of the money supply to GDP—a proximate measure of the monetary overhang. Not surprisingly, this ratio appears to be correlated with the two indicators of price control, suggesting that the monetary overhang increased rapidly through 1993 and fell significantly thereafter, reflecting the combination of a disinflationary fiscal/monetary policy and price deregulation. It also suggests that a substantial overhang remained in 1996. Finally, line 12 shows budgetary subsidies surging through 1993 before falling sharply in 1994-95.

Fig. 3. Cuba:Total Factor Productivity Growth and Non-State Sector Share of Employment

In conclusion, various indicators suggest that the partial but significant liberalization measures introduced in 1993-94 led to an appreciable increase in the role of the private sector in goods and labor markets and in the role of prices in resource allocation. It is therefore not unreasonable to think that these measures may have contributed to a substantial increase in productivity (as illustrated in Fig. 3), and therefore to an increase in output that cannot be accounted for by the growth of labor and capital inputs. What remains surprising is the magnitude of the increase, as well as the speed of the economy's response to liberalization, which, at first sight, seem quite rapid in light of the experience of countries in transition. (More on that in section 6.)

Is there a Keynesian explanation? It may be argued that the recovery of output in 1994-96 did not result from the favorable impact of liberalization on aggregate supply but rather from a Keynesian-type aggregate demand shock. It is clear that *capacity* output in Cuba fell in the early 1990's because of the disruptions associated with the collapse of the Soviet Union. Moreover, it is likely that the decline in *actual* output in that period was magnified by the adverse effects on aggregate *demand* of the fall in household consumption and investment. Along the same lines, it could be argued that the 1994-96 recovery may have reflected, at least in part, a positive Keynesian shock that boosted aggregate demand and capacity utilization, raising actual output even in the absence of an expansion in potential output. For this to be true, however, we should be able to identify a positive demand shock, i.e., a large

exogenous increase in some component of aggregate demand occurring in 1994 or slightly earlier.

There was certainly no fiscal shock. After surging during the crisis period, the fiscal deficit contracted in relation to GDP by 23 percentage points during the recovery from 1993 to 1996 (see Table 1). Neither was there any relaxation of monetary policy—actually, money growth in the 1990s was inversely correlated with GDP growth. There was no export boom: in real terms, exports of goods and services continued to fall in 1994 and 1995, although they increased strongly in 1996. And there was certainly no sugar boom: output of sugar cane stagnated in 1994, fell in 1995 to a low of 33.6 million tons, and recovered temporarily in 1996 to 41.3 million tons—still well below the levels registered in the early 1900's. Finally, there was not much of an investment boom: real gross domestic capital formation increased from 1993 to 1996, but not by much; in the latter year it was still about one fifth of its level in 1990; the contribution of net fixed capital formation to growth turned negative in 1992 and declined further in the next two years.

Finally, there is no doubt that national income has been boosted after the use of foreign currency was legalized in 1993 by dollar remittances from abroad—largely from Cuban relatives living in the United States—although there is uncertainty as to the precise magnitude of these remittances.[10] According to central bank data, these remittances have been offset in large measure by interest payments on Cuba's foreign debt. Still, the balance on net transfers and factor payments—the difference between national disposable income and GDP—has been an increasingly favorable element in Cuba's balance of payments, rising from zero in 1993 to the equivalent of 1 percent of GDP in 1996 and 1.5 percent in 1998. In any event, the rise in remittances was made possible by the legal changes introduced in 1993 and can therefore be seen as a result of liberalization.

VI. Cuba and the Economies in Transition: a Statistical Comparison

Another way to evaluate the behavior of output in Cuba during the period 1990-96 is to compare economic developments in Cuba and in the countries in transition from central planning to a market economy during that period. Fig. 4 shows the behavior of output indices in Cuba and in three transition economies: Poland, Russia, and Ukraine. The pattern of production in Poland is characteristic of the early and fast reformers, like the Czech Republic, Hungary and the Baltic countries: production initially falls steeply, but after a few years it flattens out and begins to increase rapidly.[11] In contrast, Ukraine represents the case
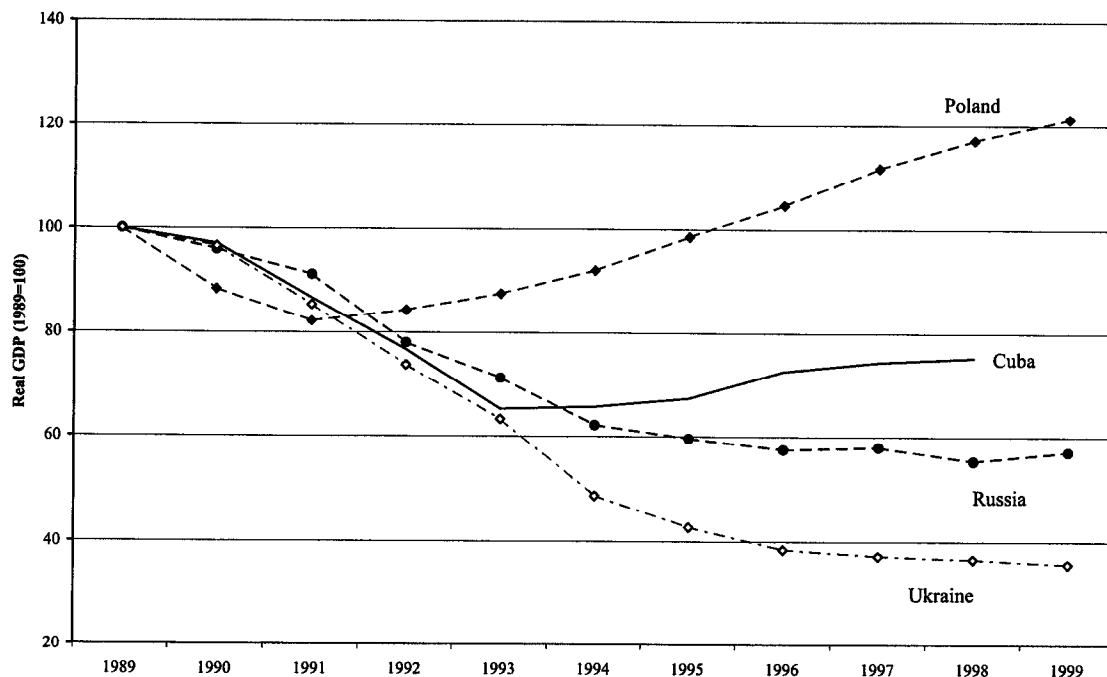
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[10] In this area, as in the area of the national accounts, CEPAL data differ from that published by Cuban official sources, notably *Banco Central de Cuba*, 1999, for reasons that remain unclear.

[11] The reasons for this pattern are associated with learning by doing by entrepreneurs, and the need to re-train the labor force (Brixiova, 1999) and to restructure the inefficient capital stock inherited from the old central panning system (Hernández-Catá, 1998).

of a slow reformer (like Turkmenistan and Belarus) where output initially falls less sharply than among the aggressive reformers, but then fails to recover for many years. Russia can be viewed as an "intermediate" reformer, but one with below-average performance of output, partly because of exceptionally difficult starting conditions including a particularly long period of central planning, and a large, inefficient industrial sector. It is also likely that the underground economy in Russia is underestimated in the official statistics to a greater extent than in many central and eastern European countries, including Poland.

Fig. 4. Real GDP in Cuba and Selected Transition Economies

Compared with those three countries, the evolution of real GDP in Cuba is remarkable: in the first years, i.e., through 1993, it is virtually indistinguishable from that of the slow reformer, Ukraine. Beginning in 1994, however, the Cuban output index turns up while that of Ukraine continues to decline. By 1998, Cuba's output index is still substantially below that of the rapid reformer, Poland, and well bellow its own level in 1989; but it is above the level of both the Ukrainian and Russian indexes.

This is a surprising pattern, but it could be rationalized along the following lines. From 1989 to 1993 both Cuba and the Ukraine made very little if any progress in reforming their economies and allowed inflation to increase to high levels (actually, to much higher levels in Ukraine than in Cuba). This similarity, coupled with the impact on both economies of the collapse of CMEA trade arrangements and the elimination of subsidies and state orders by Russia, would account for a similar evolution of economic activity in that period. Beginning

in 1994, however, Cuba introduces measures to liberalize part of the economy and implements a rigorous macro-stabilization program that quickly reduces inflation to low levels. In contrast, Ukraine's liberalization program proceeds slowly, and while inflation begins to decline in 1994 it remains very high for several years. Hence the diverging evolution of the two economies after 1993.

A more systematic approach to this question is to explain jointly Cuba's economic performance and that of the countries in transition from plan to market, in a way that allows for the effect on growth of stabilization and liberalization. This analysis was based on cross-section/time-series regressions where the rate of growth in real GDP, $g(Q)$, was related to the following explanatory variables: the ratio of investment to GDP (I/Q) used as a proxy for the rate of capital formation; the share of the private sector in the economy (s) used as a proxy for degree of liberalization;[12] and an inflation variable $ln(1+\pi)$. The regressions were estimated for an unbalanced panel of 17 transition countries, including Cuba, typically for the period 1990-97 but occasionally for a somewhat smaller or larger sample, depending on the availability of data. The estimation results, using in most cases generalized least squares (GLS), are shown in Table 6. Annex 2 defines variables and provides data sources.

Looking at individual equations in Table 6, line (1) shows the results of the basic model described above. Line (2) adds a variable (war) to capture the negative effects on growth of armed conflicts in various transition countries during the sample period. Equation (3) introduces a variable for the length of the reform period (r); the larger r, the better the expected growth performance because more time is available for enterprises to restructure the old capital stock and for workers and entrepreneurs to gain experience with markets. The next two equations are similar to equation (3), but equation (4) is estimated by ordinary least squares (OLS) instead of GLS, and equation (5) uses fixed country effects. Equation (6) adds the growth of employment, $g(E)$, but at the cost of a reduction in the sample period owing to the unavailability of employment data for some countries. All the coefficients shown in Table 6 have the anticipated sign and, except for the investment ratio in some equations, they are significantly different from zero at the 99 percent confidence level. Also, except for the length of reform variable r, the estimated coefficients are generally robust with respect to both specification and estimation method.

The equations listed in Table 6 were then estimated using a set of dummy variables for Cuba—one for each year from 1990 to 1997. The coefficients of these variables were negative through 1993, and positive thereafter, and in most cases were significantly different from zero. In other words, Cuba's real GDP growth was higher in the first period, and lower in the second, than would have been expected on the basis of the equations. While they

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[12] More general liberalization indexes, such as those developed by de Melo, Denizer and Gelb (1997) for a large number of transition countries, are not available for Cuba. The private (or non-state) share has the advantage of avoiding judgmental elements in the construction of the liberalization variables, thus avoiding possible biases.

Table 6. Growth Regressions for Transition Countries[1].
Dependent variable: real GDP growth

Equation:	Constant term	Investment ratio (I/Q)	Private sector share (s)	Inflation rate ln (1+π)	Conflict variable (war)	Length of reform (r)	Employment growth g(E)	Adjusted R^2	Estimation method	n
(1)	-6.8 (8.2)	0.05 (1.9)	0.16 (22.1)	-4.50 (9.9)		--	--	0.746	GLS	196
(2)	-6.3 (6.1)	0.07 (1.9)	0.15 (18.6)	-3.95 (7.9)	-8.40 (4.0)	--	--	0.753	GLS	196
(3)	-9.4 (7.9)	0.11 (3.1)	0.15 (19.0)	-3.66 (7.7)	-9.51 (4.8)	0.17 (7.1)	--	0.754	GLS	196
(4)	560 (4.7)	0.10 (2.0)	0.14 (5.9)	-3.69 (5.1)	-11.73 (4.0)	0.17 (3.4)	--	0.548	OLS	196
(5)	...	0.07 (2.0)	0.19 (14.8)	-4.02 (9.4)	-12.56 (5.1)	10.9 (3.8)	--	0.801	GLS with fixed effects	196
(6)	-7.2 (6.5)	0.09 (3.3)	0.11 (10.7)	-3.37 (7.0)	-8.95 (4.6)	0.22 (8.6)	0.57 (8.4)	0.764	GLS	178

1 Includes Cuba, China, Viet-Nam, the countries of Central and Eastern Europe (except Albania), the Baltic countries, and the countries of the former Soviet Union (except Turkmenistan). The sample period for most countries is 1990-97 although it may begin as early as 1989 and as late as 1995 depending on the availability of data for individual countries.

Figures in parenthesis are t-ratios based on (White) heteroskedasticity-consistent standard errors.

2 GLS indicates generalized least squares (using cross section weights). OLS indicates ordinary least squares.

certainly do not prove anything, these results suggest that Cuba's growth performance during the period 1994-97 was significantly different from that of the other transition countries, even after controlling for the effects of investment, the size of the private sector, inflation, and conflicts, and the length of the reform process.

VII. TENTATIVE CONCLUSIONS

There is no definitive answer on whether the abrupt ending of the Cuban economy's post Soviet collapse and the period of subsequent growth reflected improved policies or statistical fabrication. To be sure, there are gaps in the data, and there are some puzzling differences between data released by the government and by the Economic Commission for Latin America. There are also some internal puzzles, such as the large share of the state deficits that cannot be explained by monetary financing. The Cuban government can put an end to the remaining doubts by publishing a comprehensive and up-to-date database. The analysis also reveals some significant differences between the behavior of output growth in Cuba and in other transition economies in the 1990's.

This being said, there is a degree of consistency within the available Cuban data set that argues against the possibility of a wholesale cooking of the data—a complicated enterprise in any event. Moreover, the data appears to support the hypothesis that the growth of output and productivity in 1994-96 can be explained, at least in part, by the policies of macroeconomic stabilization and structural liberalization introduced in late 1993 and 1994, following the disastrous results of the policy of "adjustment by brute force" pursued initially in reaction to the end of Soviet assistance. It seems reasonable to conclude that the 1993-94 shift in policy was instrumental in turning the economy around, even though the liberalization measures were subject to flip-flops and were limited in scope and intensity, in comparison with those implemented in the successful transition countries. In this regard, it is revealing that Cuba's share of non-state employment leveled off at about one fourth in 1998, compared with 72 percent in China, 75 percent in Hungary, and 91 percent in Vietnam.

This suggests two tentative conclusions. First, the backtracking on several liberalization measures may explain the lackluster performance of the Cuban economy in 1997-98 and suggests that, on present policies, it is unlikely that living standards can be raised appreciably. Second, the considerable, favorable effects of the partial liberalization measures implemented in 1993-94 indicate that a complete reform program would have a far-reaching beneficial impact on the Cuban economy. But this would mean getting the government out of people's way, and allowing Cubans (and not only foreigners) to work, invest and realize profits.

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Annex 1: The Growth Accounting Framework

The numbers presented in Table 4 are derived from the following Cobb-Douglas production function:

$$g(Q) = \alpha\, g(K) + (1-\alpha)\, g(N) + \lambda$$

Where Q is real GDP, K is the capital stock, N is the labor force, and g(.) indicates the rate of growth in the relevant variable. Following Madrid (1998) the parameter α was set at 0.5. The capital stock was derived by accumulating gross fixed investment in constant prices:

$$K(t) = I(t) + (1-\delta)\, K(t-1)$$

Data for I and N are from CEPAL (2000). The depreciation rate (δ) was assumed to be 9 percent per annum and the initial value of the real capital stock was taken from Madrid (1998).

Annex 2: Sources of Variables Used in the Regressions

The following variables were used in the regressions discussed in section 6.

$g(Q)$ = rate of growth of real GDP.

I/Q = ratio of gross domestic investment to GDP. For Cuba, China and Vietnam, ratio of gross fixed capital formation to GDP.

s = share of private sector in GDP. For Cuba, China, and Vietnam, non-state sector share of employment.

π = rate of consumer price inflation, annual average. For Cuba, rate of increase in GDP deflator for goods.

War = dummy variable equal to one in periods of armed conflicts and to zero otherwise. Conflict periods were: Armenia (1990-93), Azerbaijan (1990-94), Croatia and Macedonia (1991-92), Georgia (1990-93), Tajikistan (1993-95).

r = first year of reform period. Defined as the year in which the relevant de Melo-Gelb-Denizer (1996) liberalization index reaches 0.1. (For each country this index is defined by the authors to range from zero to one, with one representing a fully liberalized market economy.) The beginning of the reform period in Cuba was set at 1994.

g(E) = rate of growth of employment

Data for countries of the former Soviet Union, the Baltic region and Central and Eastern Europe are from EBRD (1999). Data for China and Vietnam are from IMF, World Economic Outlook and from deMelo, Denizer, Gelb, Denizer and Tenev (December). Data for Cuba are from CEPAL (2000), Perez-Villanueva (1998), and Banco Central (2000).