IMF Working Paper

Guyana: Why Has Growth Stopped? An Empirical Study on the Stagnation of Economic Growth

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**Guyana: Why Has Growth Stopped? An Empirical Study
on the Stagnation of Economic Growth[1]**

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Abstract

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After a period of exceptionally strong economic performance, Guyana's growth has stagnated since 1998. The paper tries to identify the factors that can explain this dramatic deterioration in economic performance. The paper first attempts to explain the decline of growth with a growth accounting exercise which shows that there was a significant swing in total factor productivity, and than uses a panel regression framework to analyze the growth impact of changes in various factors. Finally, through a series of cross-country exercises, the paper shows that the primary reasons for the divergence between the economic performance of Guyana and other Caribbean, HIPC, and PRGF-eligible countries in 1998-2004 are a substantial decline in share of net foreign and private domestic investment in GDP, a decline in the labor force, and a less favorable political and institutional environment.

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I. INTRODUCTION

With the transition from socialist-inward looking economic model to a market oriented one in the early 1990s, growth in Guyana took off sharply. For several years, Guyana enjoyed one of the fastest rates of growth in the region and among low income countries. Subsequently, however, economic activity slowed dramatically beginning in 1998, with average growth falling from 7.1 percent during 1991–97, to 0.6 percent in 1998–2004, well behind the Caribbean region, and one of the lowest among highly indebted poor countries (HIPCs) and among eligible countries for the Poverty Reduction Growth Facility (PRGF) (Figure 1, Table 1). While some slowdown may be expected after the initial strong response to market-oriented-reform, including as a result of the diminution of capital inflows after the completion of major privatizations, the evolution of growth in Guyana is radically different from that of other countries that embarked on large scale liberalization programs (Figure 2).

Figure 1. Average Annual Economic Growth in Selected Countries
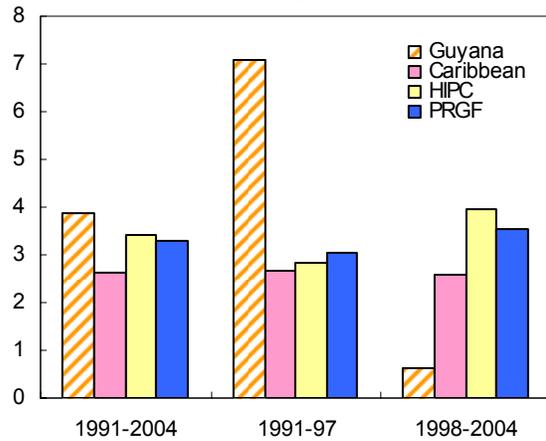
Source: World Economic Outlook.

Figure 2. Real GDP in Transition Countries
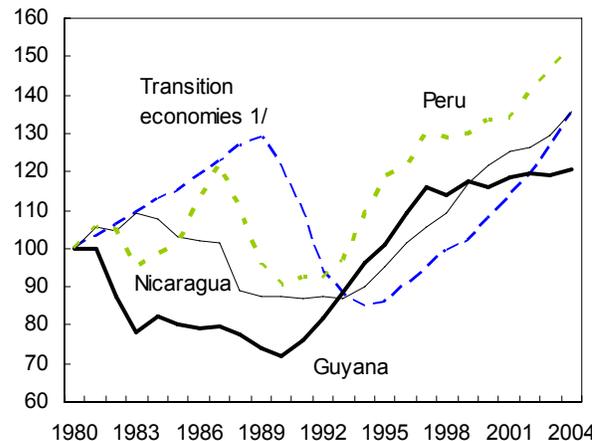
Source: World Economic Outlook.
1/ Reflects the average of 28 transition economies in Eastern Europe and Central Asia.

The paper finds, with the help of a growth accounting framework, that a significant part of the slowdown can be explained by declining growth rates in factor accumulation. This is indeed consistent with the massive emigration during the latter part of the 1990s and a dramatic slowdown in foreign and domestic investment. However, the difference in the growth in total factor productivity (TFP) in the two sub-periods suggests that other factors played a significant role.

To identify the most significant developments affecting growth, the paper analyzes the contribution of key factors within a regression based analysis. It finds that in addition to the steep fall in investment and labor, a deterioration of the political and institutional environment relative to that in other countries played an important role.

The remainder of the paper is organized in four sections. Section 2 summarizes key stylized facts that provide a better understanding of the context in which the decline in economic activity occurred, and uses growth accounting to identify the segment of the decline that cannot be explained by changes in labor and capital accumulation. Section 3 investigates a range of factors that explain the variation in growth using panel analysis and pooled difference data. Section 4 summarizes the paper's findings.

II. STYLIZED FACTS AND GROWTH ACCOUNTING

A. Background

Guyana initiated a comprehensive economic reform program in late 1980s, with the support of the IMF, following an extended period of experimentation with a socialist based, inward looking, economic model—generally referred to as **"cooperative socialism"**—that left the country highly indebted and virtually bankrupt. The reforms aimed to develop a market-based economy, and entailed significant privatization. More than 80 percent of government assets were privatized or liquidated between 1990-1994, with only the production of sugar, public utilities, and one commercial bank remaining in the public domain. These reforms initially paid off very handsome returns, with very rapid economic growth in response to the market-oriented reform, facilitated by a dramatic increase in foreign direct investment.

Nevertheless, notwithstanding significant investment and substantive reforms in the initial years, the economy continued to face many constraints to growth.

- The economy remained highly dependent on the export of a few primary commodities, with poor access to external markets. The share of the five main export commodities—sugar, gold, rice, timber and bauxite—only slightly declined during the period, from over 80 percent in 1991 to about 75 percent in 2004 (Figure 3). The lack of large deep-sea port facilities and limited air transportation routes significantly limits the potential for diversification.

Figure 3. Export Commodities
(In percent of total exports)

Source: Guyanese authorities.
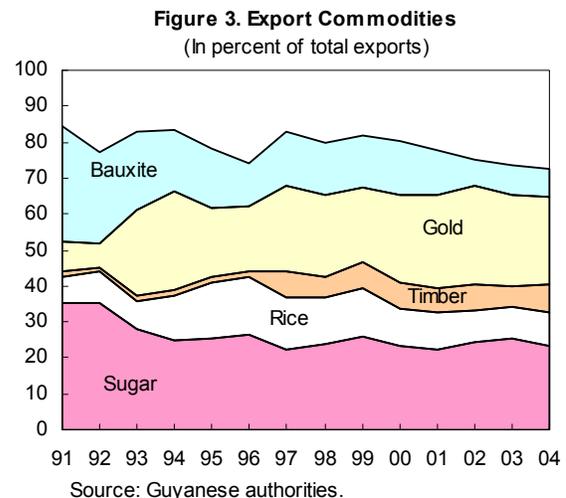
- Like other low-income countries, Guyana suffered from underdeveloped labor and capital markets, with limited access to credit, and these constraints became even more severe in the latter part of the 1990s. Emigration, especially among the highly educated, has always been very high, and the pace emigration picked up in second half of the 1990s as a result of renewed social and political tension, resulting in a

shortage of skilled workers and a severe brain drain.[2] At the same time, the deterioration in economic conditions coupled with a tightening of prudential regulation, led to a rapid increase in non-performing loans (NPL) —from 12 percent in 1996 to a peak of 38 percent in 2001 before declining to about 18 percent in 2004 (Figure 4). This in turn, contributed to a dramatic decline in private sector credit.

Figure 4. Private Credit and Nonperforming Loans 1/
(In percent)
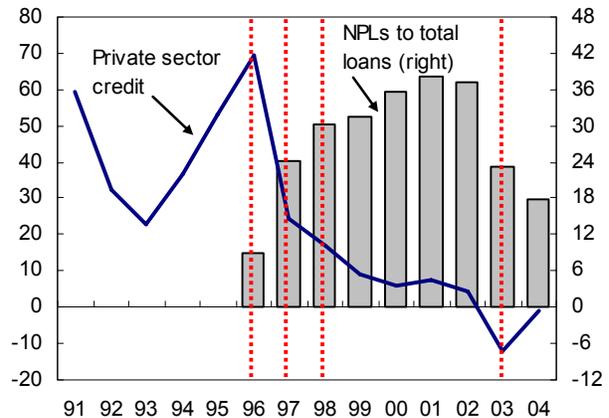
Source: Guyanese authorities.
1/ EU preferential market access reduced in 1996; El Niño in 1997; La Niña in 1998; and privatization of GNCB in 2003.

- Infrastructure remained very deficient. The transportation network is underdeveloped and only 7.4 percent of roads are paved. Electricity production is highly inefficient, and is by far the most costly in the region—in part, reflecting transmission and distribution losses of about 42 percent of the output—and service is unreliable (with frequent blackouts, such that a significant portion of the private sector relies on its own generators).[3] Water services are also expensive and insufficient. Telecommunication services are better developed but expensive due to the near-monopoly of telecommunication company.

- The regulatory framework remained complex and cumbersome. Decisions process continues to be very centralized, enforceability of laws remains low and the court system is slow, with a large backlog of unresolved cases. While significant progress has been made in recent years, acquisition of land for investment is still a lengthy and costly process and most of the land remains in the hands of the government. This, combined with the failed privatization of public electricity company, has had a negative impact on the investment climate. There has also been some progress in improving the regulatory framework with the Investment Act and Small Business Bill, and the establishment of a commercial court, although significant problems remain.

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[2] Carrington and Detragiache (1998) show that emigration rates of the highly educated population in Guyana are one of the highest in the world - 70 percents of individuals with over 13 years of schooling have moved to the USA in the year 1990.[2] Similarly, Mishra (2006) reports that during 1965-2000 about 43 percent of Guyanese workers with secondary education and 89 percent with tertiary education migrated to OECD member countries.

[3] The privatization of the electricity company in 1999 failed to improve the situation and its ownership reverted to the government in 2003.

Progressive deterioration in the political and security climate has also been detrimental to investment and growth. The longstanding political tensions between the two main political parties, which reflect the polarized nature of Guyanese society, have led to increased instability in the latter part of the 1990s, including violent protests in the wake of the December 1997 and 2001 elections.[4] [5] The situation was compounded by a lengthy civil servants strike in 1999, and an increase in organized crime, particularly in 2002-2003.

In summary, the slowdown would appear consistent with the tapering of growth after the initial steep recovery, more modest investment after the completion of the major privatizations, and continuing impediments to growth. Further, the decline could have been made more severe by the concurrent adverse domestic and external developments. However, the degree of the slowdown together with its duration is perplexing, particularly taking into account that many of the above identified factors are common to many developing countries.

An important caveat to the analysis is the problem of measurement.

- There are significant data issues with measuring GDP and its growth. The national accounts are based on 1988 pre-reform production pattern, when Guyana's private sector was very small, and mining and agriculture overwhelmingly dominated economic activity. Thus, the contribution of the expansion of the private sector to economic activity following market reforms, particularly the growth in services, has been significantly under reported. Further, the large informal sector, which also certainly expanded in recent years, is not being accounted for.[6] These measurement problems suggest an increasing underestimation of the GDP and GDP growth. Nevertheless, these data problems would at best suggest that the decline in growth between the two periods was less sharp, but they would not explain the striking break in the trend between the two periods.

- Capital is likely to have been overestimated. Given the state of infrastructure, a significant part of public investment is for maintenance and repair rather than productive capital. Further, in recent years, with the support of the IFIs, an increasing part of the public capital spending has been directed towards social investment, such as school and hospitals, which may in the long-term have positive returns, but will lead to an overstatement of productive capital. Finally, with the increase in crime, there has been an increase in both public and private investment in security. To some

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[4] Da Costa provides a comprehensive summary of the origins of the political tension between the two main ethnic groups in Guyana.

[5] The two major parties are the People's Progressive Party-Civic representing Indo-Guyanese and the People's National Congress-Reform representing Afro-Guyanese.

[6] Faal (2003) estimated that is was about 40 percent. Other estimates suggest that the informal sector could be 60 percent of GDP.

extent, many low-income countries face similar problems, although there are Guyana specific reason that the share of maintenance and repair may be larger.[7]

B. Growth Accounting

This section reports the results of a simple growth accounting exercise. In the model, the Solow residual—Total Factor Productivity (TFP)—is a function of the growth of real GDP, labor, and capital. GDP growth rates are calculated from data on Gross Domestic Product at constant prices as reported in the World Economic database. In the absence of other data, population from the International Financial Statistics database is used to proxy labor supply. The capital stock series is estimated with data on gross fixed capital formation at current prices from the World Economic Outlook by using the perpetual inventory method.[8] However, the inability to take into account the effect of migration on both the quantity and quality of the labor force may mean the labor supply is overstated. This, and the likelihood that capital is also smaller than estimated (as noted above), would imply that the Solow residual is overestimated.

The results shows that while much of the economic growth rate can be explained by changes in labor and capital, there remains a significant residual that suggest other important factors were at play as well. (Table 2). The average growth rate of 3.9 percent for the period 1991–2004 can be attributed to an increase in the labor force of 0.1 percent and in capital of 3.9 percent, with all other factors contributing approximately 1.8 percent. Further, the growth accounting framework shows that the large differences in growth between the two periods are partly explained by changes in the growth of population and capital. The growth of the labor force declined from 0.6 percent during 1991–1997 to –0.4 percent in 1998–2004, while capital accumulation fell from 5.8 percent in 1991–1997 to bellow 2 percent in 1998–2004.[9] Nevertheless, the large change in growth in TFP (Figure 5) in the two periods suggests that aside from changes in patterns of labor and capital accumulation there was also a significant change in various other factors affecting economic performance.

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[7] Including the need for significant maintenance for the prevention of flooding reflecting that the majority of the population lives in Georgetown and its surroundings, on reclaimed sea land.

[8] Appendix I provides a more detailed discussion of the model and the data.

[9] The negative average for the period of 1998–2004 is driven by the large emigration of 2000–2001.

Figure 5. Growth Accounting Exercise
(In percent)
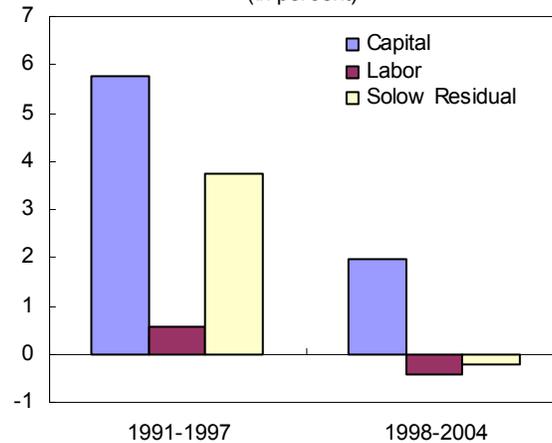
III. REGRESSION-BASED ANALYSIS

This section shows that the decline in growth rates between the first and second sub-periods was to a large degree the result of adverse exogenous shocks, including a decline in terms of trade, and a deterioration of the political and institutional environment. Nevertheless, even after taking these factors into account, there still remains a significant unexplained decline in growth.

To compensate for the limited data for 1991–2004—only 14 annual observations—we use a panel framework to study growth performance of Guyana and other Caribbean, HIPC, and PRGF-eligible countries. This permits the inclusion of additional information underlying the cross-country variation into the estimation of the model parameters. Notwithstanding potential endogeneity problems and the limitations of data quality and availability, empirical findings should be able to shed some light on the relative importance of various factors for economic growth. Indeed, in most of the regressions, the coefficients take expected signs and magnitudes but the regressors still explain only a moderate part of the variation in growth rates in the studied countries.

The panel regressions allows the model to capture two types of information—that reflected by differences between countries and that reflected by changes within countries over time. Two sets of parameters are estimated based on results obtained with fixed and random effects models.[10] To discriminate between fixed and random effects models, the Hausman test statistics is reported.

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[10] A fixed effects regression permits control for omitted variables that systematically differ between cases but are constant over time. Random effects control for omitted variables that change over time but are constant between cases and for omitted variables that differ between cases but are constant over time.

We first look at cross-country experiences to determine which additional factors may explain the sharp decline in growth, focusing on three subsets of countries: six Caribbean countries, HIPC countries, and PRGF-eligible countries. The sample of Caribbean countries is quite heterogeneous in terms of macroeconomic fundamentals and initial conditions.[11] Nevertheless, their geographic proximity might help to take into account region-specific factors. The model is also used to compare the growth performance of Guyana with other HIPC completion point countries and a sample of PRGF-eligible countries which are closer to Guyana in terms of structural features.[12]

The model aims to explain economic growth rates in country i in year t using the autoregressive structure of growth rates, fluctuations in labor force growth, changes in political and institutional environment, and variations in foreign, public and private investment:[13]

$$G_{it} = b_0 G_{it-1} + b_1 G_{it-2} + b_2 \Delta Labor_{it} + b_3 \Delta Pol\_Risk_{it} + b_4 CF\_Private_{it} + b_5 CF\_Public_{it} + b_6 FDI_{it} + b_7 ToT\_gs_{it} + \varepsilon_{it} \tag{1}$$

Developments in the political and institutional climate are gauged by the change in the ICRG Political Risk Index, ΔPol_Risk_t, and variations in terms of trade for goods and services, ToT_gs_{it}, are used to account for the open nature of these economies.[14] The model uses capital formation in the private and the public sector - $CF\_Private_{it}$ and CF_Public_{it} respectively.[15] Results of the estimation of equation (1) are reported in Table 3.

The model used in the paper includes some of the primary factors conventionally believed to influence economic performance of countries. Numerous studies have explored the growth impact of such factors as private and public investments, structural reforms, good governance, and various exogenous factors (e.g., terms of trade or weather conditions). In light of Guyana's experience—particularly in the second half of the sample—with significant emigration, inclusion of labor dynamics in the model is viewed as critical. While quality of

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[11] The availability of the ICRG Political Risk Index limits our sample of Caribbean countries to Suriname, Dominican Republic, Haiti, Jamaica, and Trinidad and Tobago and a subset of HIPC and PRGF-eligible countries.

[12] HIPC completion point countries include Bolivia, Burkina Faso, Cameroon, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Honduras, Madagascar, Malawi, Mali, Mozambique, Nicaragua, Niger, Senegal, Sierra Leone, Tanzania, Uganda, and Zambia

[13] Specifics of the data used in our analysis are described in the Appendix I.

[14] The ICRG Risk Rating System assigns points to components grouped into risk categories as political, economic and financial.

[15] In this paper, the private capital formation refers exclusively to the total private investment net of FDI, thus capturing only its domestic component. FDI is included in the regressions as a separate regressor.

education and of health system is also likely to be important for growth performance, absence of reliable data prevents inclusion of these variables in the analysis. The model assumes that—aside from the influence of the abovementioned factors—economic growth rates follow an AR(2) process.[16] [17]

The parameter estimates for the model are potentially subject to the endogenity bias. The paper follows existing literature and treats the evolution of political and institutional environment, levels of private and public investments, and flows of foreign direct investments as exogenously determined factors that affect growth in a particular country. However, in reality, all these factors are inter-connected. Nevertheless, in the sample of countries considered the simultaneity bias appears rather weak as reflected by low correlations among the abovementioned variables, perhaps reflecting complex nature of interrelationship between political processes and investor incentive structure. This may reflect that in small open economies FDI may be more affected by commodity prices and expected growth in trading partners than governance and security considerations. Table 4 reports these correlations for the HIPC sample. Correlations coefficients in Caribbean and PRGF-eligible countries samples are very similar to the ones reported in Table 4.

The results of the fixed effects model for the Caribbean countries suggest that there is little evidence of an autoregressive structure of economic growth rates in the sample. Most of the explained variations in growth rates across countries are captured by cross-country differences in institutional and political stability and by variations in private domestic and foreign investment. The overall fit of the model can explain approximately 30 percent of variations in economic growth rates. By contrast, the random effect model explains almost 40 percent of economic growth variations and predicts that economic growth exhibits strong autoregressive pattern and the coefficient for private domestic capital formation is insignificant. The Hausman test statistics indicates that parameter estimates obtained under fixed and random effects models are different from each other—the p-value is essentially zero—favoring the results under the fixed effect model.

The results of the model fitted to the sample of HIPC countries point to similar results, with political stability and institutional quality being important for economic growth. Further, economic performance in these countries exhibits a strong statistical dependency on variations of labor-force growth rates. Another interesting feature of these countries is that public capital formation contributes significantly to higher economic growth. Indeed, when fixed effects results are considered, the coefficient on private capital formation is not statistically significant while the coefficient on public investment is not only highly

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[16] Nsouli and others (2004) conducted model specification tests for similar set of countries and concluded that two lags strike a proper balance between the explanatory power of the model and the degrees of freedom.

[17] To address the problem of bias that may arise from the inclusion of lagged dependent variable as regressors, the model is also estimated using Arellano and Bond (1991) first-difference instrumental variable estimator with two lags of the regressors used as instruments.

significant but also variations in this variable are expected to strongly influence economic growth. Under the random effects regression both forms of investment are found to be equally important for economic growth. There is also strong evidence that foreign direct investment is an important determinant of economic growth in HIPC countries.[18]

The results obtained over the sample of PRGF-eligible countries are qualitatively similar to the estimates obtained in the HIPC sample, variations in both private and public investment are statistically important in explaining variations of economic growth in both fixed and random effects regressions. While most of the parameter estimates obtained using Arellano-Bond first difference instrumental variables model are numerically similar to those in the fixed and random effects models, only coefficients on labor force growth and on political and institutional variable are statistically significant.

A puzzling observation is that variations in terms of trade would appear to have little impact on economic growth in all three samples. While entering regressions with expected positive sign, estimated coefficients are numerically negligible and statistically insignificant. This may reflect the fact that generalizing a great deal of volatility in export and import prices in a single weighted average might mask a lot of informative variation. Another possible explanation may be that changes in primary commodity prices affect considered countries in a similar manner and, to a certain extent, simultaneously, dampening importance of cross-country variation in the framework of an empirical exercise. Yet another possible explanation is that investment decision are made on expected terms of trade, resulting in a weak relationship between contemporaneous terms of trade and economic activity.

Since this paper relies on the panel data model to identify the factors that are important for economic growth of countries in the sample and then extrapolates these findings on the Guyanese economy, it is important to compare the model's performance in predicting the evolution of growth rates in Guyana with that in other countries. Figure 6 plots country-specific residuals from the fixed effects model fitted into the sample of HIPC countries. The model can reasonably well characterize Guyana's economy as residuals computed from the Guyana's data appear to exhibit a comparable variance with those in most of the other countries.[19] On the other hand, the obvious outliers in terms of residuals' distribution are Guinea Bissau, Malawi, and Sierra Leone.

To further identify the reasons for differences between growth rates in Guyana and other countries the paper exploits the format of pooled regression in differences of the following form:

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[18] The Hausman test favors the fixed effect model.

[19] Qualitatively similar results are obtained for Caribbean and PRGF-eligible samples.

$$(G_{gt} - G_{mt}) = c_0 + c_1(G_{gt-1} - G_{mt-1}) + c_2(G_{gt-2} - G_{mt-2}) + c_3(\Delta Labor_{gt} - \Delta Labor_{mt}) +$$
$$+ c_4(\Delta Pol\_Risk_{gt} - \Delta Pol\_Risk_{mt}) + c_5(CF\_Private_{gt} - CF\_Private_{mt})$$
$$+ c_6(CF\_Public_{gt} - CF\_Public_{mt}) + c_7(FDI_{gt} - FDI_{mt})$$
$$+ c_8(ToT\_gs_{gt} - ToT\_gs_{mt}) + \varepsilon_{gmt} \qquad (2)$$

where all variables are as defined earlier. In equation (2), subscripts *g* and *m* refer to the corresponding variable for Guyana and a specific country of comparison, respectively. Controlling for systematic differences in factors that, according to the previous analysis, are important determinants of economic growth makes intuitive sense and is crucial in explaining stagnated growth of the Guyanese economy in the second half of the sample.[20]

Table 5 summarize pooled regression estimation results for the three cases. The model is capable of explaining 55 percent of growth rate differences between Guyana and other Caribbean countries. The model is somewhat less successful when comparing Guyana to the other HIPC and PRGF-eligible countries, although its explanatory power is still rather strong as reflected by R-square statistics of 0.41 and 0.33 respectively.

Cross-country differences in the evolution of political and institutional environment, labor force dynamics, domestic private and public capital formation, and foreign direct investment flows explain a substantial part of the differentials between Guyana's economic growth and economic performance of other countries.[21] Table 6 reports the mean differences in economic growth rates and differences in the identified primary determinants of economic performance. Table 7 provides average contributions of differences in these growth determinants to the predicted difference in growth rates.

In the earlier half of the sample, the Guyanese economy grew on average 5.5, 4.8, and 4.2 percent faster than other Caribbean, other HIPC, and other PRGF-eligible countries, respectively. In comparison with the three control groups, the Guyanese economy was characterized by higher growth rates of public capital formation and dramatically larger inflows of foreign direct investment (expressed as a share of GDP) and by faster improvements in the political and institutional environment. The largest contributor to the difference in economic performance were FDI inflows—the annual estimated impact averaging 3.7–5.6 percent of additional growth, depending on the control group—closely followed by public investment adding on average another 2.3–4.8 percent to economic growth. These positive developments were sufficient to offset the negative impact of Guyana's lower labor force growth and lower rates of domestic private investment.

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[20] By construction, the format of pooled regression in differences nets out the impact of unobserved factors—of regional or structural nature—common for the numeraire and other considered countries, improving explanatory power of the estimated model.

[21] Caribbean sample results are somewhat different as labor force growth and private investment enter regressions with expected signs but are statistically insignificant.

In 1998–2004, however, the average growth rate in Guyana was 2.5, 3.7, and 3.3 percent below the mean growth rates of comparative groups. In the second half of the period, the most striking change was the large decrease in FDI flows (a decline of about 9 percent of GDP relative to the earlier period). While FDI continued to exceed that in the control group by a small margin, the relative fall in its magnitude explains about 3 to 5 percent in the relative deterioration between the two periods. There is also a dramatic worsening of the accumulation of domestic private investment and a further lagging in labor force growth, which together explain a further 2 to 4 percent of the worsening of the growth differential. Furthermore, a deterioration in the political and institutional environment of Guyana relative to other countries, explains another 0.5 to 1 percent.[22] Public capital formation rates remained significantly higher relative to the three control groups. While positively contributing to economic growth, the higher rates were insufficient to offset the deterioration in other factors.

How general is the claim that observed differences in economic growth rates of different countries can be explained by divergence in the evolution of political and institutional environment, variations in labor force dynamics, differentials in domestic public and private investment, and differences in foreign direct investment? To address this question, we study the economic growth differentials between Suriname—a country with a very similar macroeconomic structure to Guyana—and the other Caribbean countries. The last set of estimates in Tables 5–7 summarizes these findings. Since Suriname's economic performance, relative to other countries, qualitatively changes in 2001, the sample is split into two corresponding sub-samples when reporting mean differences in economic growth rates and their underlying determinants.

The results for Suriname indicate that the qualitative conclusions of the previous section remain the same: relatively weaker growth performance of Suriname's economy during 1991–2000 is explained by relatively worse performance in all five areas important for economic growth. In particular, Suriname was characterized by substantially lower rates of domestic and foreign private investment than observed on average in other Caribbean countries.[23] During this earlier sub-period, improvements in the political and institutional environment in Suriname took place at (on average) the same rate as in other countries in the sample, which could not contribute to stronger relative performance. However, Suriname is characterized by substantial relative improvements in political stability and private investment in the post-2001 period. Notwithstanding relatively lower public capital

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[22] In sharp contrast with across border significant improvements in all components of the index in the preceding decade, the Composite ICRG Political Risk Index for Guyana exhibits a significant deterioration in 1998–2004, mostly on account of raising risks of internal conflict and worsening investment profile (see Appendix I for details on the ICRG index).

[23] Domestic investment is not significant in the pooled regression in differences in the case when Suriname is used as a numeraire country. It may be explained by the presence of the collinearity problem between private investment and FDI flows.

formation, these positive developments would appear to have been sufficient to generate higher economic growth. Indeed, growth rate differentials between Suriname and other Caribbean countries in 2001–2004 are positive and average around 2 percent.

To graphically illustrate the importance of private investment and political stability for sustained economic growth, Figure 7 plots the means of the yearly differences in economic growth of Guyana and other Caribbean countries against mean-differentials in private investment and mean-differentials in the evolution of political environment. Figure 8 repeats this exercise for Suriname. As predicted by the model, superior economic performance is associated with relative improvements in the political and institutional climate and higher shares of private investment to GDP. The opposite is also true. Indeed, the vast majority of observations is found in the positive-positive or negative-negative quadrants.

IV. CONCLUSION

The sharp decline in growth in Guyana after the initial rapid expansion that followed the implementation of major economic reform has been puzzling observers and policymakers for some time. While the initial expansion was more rapid than observed in other transition economies, those economies, in contrast to Guyana's, were able to sustain the expansions. While many factors, including weak infrastructure, adverse terms of trade, and exogenous shocks, appear to explain the slowdown of growth, the sharpness of the decline and its long duration have raised questions as to why has Guyana been more vulnerable to the adverse developments that also affect other developing countries.

The paper shows that a persistent decline in factor accumulation played an important role for the continued weakness of growth. However, the exercise also highlights the importance of other factors for the weak growth performance of Guyana in the second half of the period studied. These factors include the significant deterioration in the political and institutional environment, which coincided with a dramatic reduction of labor force due to emigration, and a sharp decline in domestic and foreign direct investment. While public investment in Guyana remained substantially higher than in other Caribbean, HIPC, and PRGF-eligible countries, it could not compensate for the deterioration in other factors and, as a result, it did not translate into higher economic growth.

The empirical findings of this paper also strongly suggest that revitalizing private investment—domestic and foreign—would be key for restoring sustained economic growth in Guyana. Nevertheless, increasing private sector investment will require significant improvements in the investment climate, which is inseparable from strengthening political stability. Therefore, priority should be given to working towards political consensus and improvements in governance and institutional quality, which will generate high returns in terms of future economic growth.

Table 1. Average Annual Economic Growth in Selected Countries

	1991-2004	1991-97	1998-2004
Guyana	**3.9**	**7.1**	**0.6**
Caribbean	2.6	2.7	2.6
HIPC	3.4	2.8	4.0
PRGF	3.3	3.1	3.5

Source: IFS.

Table 2. Growth Accounting Exercise

Period	Change in Capital, %	Change in Labor, %	Change in GDP, %	Solow Residual, %
Capital Stock 1990	16.06			
1991	6.10	-4.21	6.03	5.02
1992	9.33	2.77	7.76	1.35
1993	6.63	1.08	8.20	4.12
1994	3.23	2.24	8.48	5.58
1995	5.05	1.27	5.06	1.70
1996	4.99	0.55	7.96	5.02
1997	4.98	0.15	6.18	3.46
1998	3.66	-0.21	-1.71	-3.53
1999	2.49	0.52	2.99	1.39
2000	2.07	-1.15	-1.35	-1.84
2001	1.45	-3.65	2.26	3.43
2002	1.20	0.70	1.15	0.14
2003	1.10	0.52	-0.65	-1.51
2004	1.89	0.32	1.57	0.40
1991-2004	3.87	0.06	3.85	1.77
1991-1997	5.76	0.55	7.09	3.75
1998-2004	1.98	-0.42	0.61	-0.22

Table 3. Cross-Country Panel Regressions

	Caribbean Countries			HIPC Countries			PRGF-eligible Countries		
	Fixed Effects	Random Effects	Arellano-Bond 1/	Fixed Effects	Random Effects	Arellano-Bond 1/	Fixed Effects	Random Effects	Arellano-Bond 1/
Constant	-5.06***	-1.42	-0.18	-4.84***	-3.43**	-0.06	-3.85***	-1.52*	0.01
	(1.79)	(1.48)	(0.12)	(1.85)	(1.39)	(0.12)	(1.33)	(0.91)	(0.08)
G_{it-1}	0.10	0.25**	-0.01	0.09	0.15***	-0.00	0.18***	0.27***	0.10*
	(0.10)	(0.11)	(0.11)	(0.06)	(0.06)	(0.07)	(0.04)	(0.04)	(0.05)
G_{it-2}	0.05	0.11	0.04	-0.06	-0.01	-0.11	-0.05	0.01	-0.05
	(0.10)	(0.10)	(0.11)	(0.06)	(0.06)	(0.07)	(0.04)	(0.04)	(0.05)
$\Delta Labor_t$	0.19	0.18	0.53	1.35***	1.19***	2.44***	0.85**	0.44**	2.34***
	(0.44)	(0.43)	(0.67)	(0.45)	(0.35)	(0.81)	(0.39)	(0.22)	(0.77)
ΔPol_Risk_t	0.20**	0.25**	0.20**	0.23***	0.22***	0.17*	0.19***	0.22***	0.16**
	(0.09)	(0.10)	(0.09)	(0.08)	(0.08)	(0.09)	(0.05)	(0.05)	(0.07)
$CF\_Private_t$	0.28***	0.07	0.26***	0.04	0.12**	0.07	0.12**	0.10***	0.07
	(0.08)	(0.07)	(0.10)	(0.10)	(0.06)	(0.15)	(0.05)	(0.04)	(0.09)
CF_Public_t	0.24	0.06	0.18	0.40***	0.18**	0.27	0.41***	0.19***	0.18
	(0.17)	(0.09)	(0.18)	(0.13)	(0.08)	(0.19)	(0.09)	(0.05)	(0.14)
FDI_t	0.41***	0.32***	0.45***	0.38**	0.33***	0.05	0.17**	0.12**	-0.06
	(0.10)	(0.09)	(0.12)	(0.17)	(0.11)	(0.28)	(0.08)	(0.05)	(0.12)
ToT_gs_t	0.00	0.03	0.03	0.00	0.00	0.03	0.02	0.02	0.01
	(0.04)	(0.04)	(0.04)	(0.02)	(0.02)	(0.03)	(0.01)	(0.01)	(0.02)
Num of Obs.	84	84	66	289	289	228	555	555	437
R^2	0.27	0.38	--	0.12	0.17	--	0.15	0.18	--
Hausman-Test p-value	0.00			0.00			0.00		--

*, **, *** - Statistically significant at a 10, 5, and 1 percent level respectively. Standard errors in parentheses.
1/ Arellano-Bond estimates are reported for the model in differences of the independent variables. Results of Sargan test of over-identifying restrictions and of Arellano-Bond test of autocorrelation in residuals are available upon request.

Table 4. Cross-Correlations in HIPC Sample

	G_{it}	G_{it-1}	G_{it-2}	ΔLabor $_t$	ΔPol_Risk $_t$	CF_Public $_t$	CF_Private $_t$	FDI $_t$	ToT_gs $_t$
G_{it}	1.00	...	...	...	...	...	...	...	...
G_{it-1}	0.27	1.00	...	...	...	...	...	...	...
G_{it-2}	0.12	0.26	1.00	...	...	...	...	...	...
ΔLabor $_t$	0.17	0.20	0.13	1.00					
ΔPol_Risk $_t$	0.20	0.09	0.04	0.11	1.00	...	...	...	...
CF_Public $_t$	0.10	0.06	0.05	-0.27	-0.01	1.00	...	...	...
CF_Private $_t$	0.14	0.20	0.22	0.21	0.07	-0.33	1.00	...	...
FDI $_t$	0.14	0.14	0.09	-0.40	0.01	0.29	-0.16	1.00	...
ToT_gs $_t$	-0.00	-0.07	0.03	-0.04	-0.02	0.05	-0.02	0.00	1.00

Table 5. Cross-Country Pooled Regressions in Differences

Numeraire Country:	Guyana			Suriname
Independent Variable	Caribbean Countries	HIPC Countries	PRGF-eligible Countries	Caribbean Countries
Constant	-5.00**	-1.56*	-1.82***	0.54
	(1.94)	(0.87)	(0.62)	(0.65)
$(G_{gt-1} - G_{mt-1})$	0.04	0.06	0.17***	0.16
	(0.12)	(0.06)	(0.04)	(0.11)
$(G_{gt-2} - G_{mt-2})$	0.08	-0.01	-0.01	0.08
	(0.11)	(0.05)	(0.04)	(0.10)
$(\Delta$Labor $_{gt} - \Delta$Labor $_{mt})$	0.34	0.86***	0.36***	0.46
	(0.32)	(0.19)	(0.13)	(0.47)
$(\Delta$Pol_Risk $_{gt} - \Delta$Pol_Risk $_{mt})$	0.26*	0.26***	0.20***	0.58***
	(0.16)	(0.08)	(0.05)	(0.15)
$(CF\_Private _{gt} - CF\_Private _{mt})$	0.10	0.26***	0.23***	0.05
	(0.07)	(0.05)	(0.03)	(0.07)
$(CF\_Public _{gt} - CF\_Public _{mt})$	0.40***	0.23***	0.25***	0.05
	(0.15)	(0.07)	(0.05)	(0.10)
$(FDI _{gt} - FDI _{mt})$	0.50***	0.46***	0.33***	0.30***
	(0.09)	(0.07)	(0.04)	(0.08)
$(ToT\_gs _{gt} - ToT\_gs _{mt})$	-0.01	-0.01	-0.01	-0.02
	(0.06)	(0.02)	(0.01)	(0.05)
Number of Observations	70	275	541	70
R^2	0.55	0.41	0.33	0.48

*, **, *** - Statistically significant at a 10, 5, and 1 percent level respectively.
Standard errors in parentheses.

Table 6. Average Differences in Economic Growth Rates and Their Determinants 1/

Numeraire Country:	Guyana						Suriname	
	Caribbean Countries		HIPC Countries		PRGF-Eligible Countries		Caribbean Countries	
	1991-1997	1998-2004	1991-1997	1998-2004	1991-1997	1998-2004	1991-2000	2001-2004
$(G_{gt-1} - G_{mt-1})$	5.50	-2.51	4.76	-3.71	4.16	-3.25	-2.24	2.04
$(\Delta Labor_{gt} - \Delta Labor_{mt})$	-0.50	-1.42	-2.04	-3.16	-1.69	-2.45	-0.41	0.09
$(\Delta Pol\_Risk_{gt} - \Delta Pol\_Risk_{mt})$	1.26	-0.27	2.55	-1.14	2.20	-0.78	-0.01	2.04
$(CF\_Private_{gt} - CF\_Private_{mt})$	-8.71	-14.7 9	-2.59	-6.42	-4.63	-8.22	-0.43	6.06
$(CF\_Public_{gt} - CF\_Public_{mt})$	12.06	11.63	7.98	5.83	9.06	6.94	-2.47	-2.66
$(FDI_{gt} - FDI_{mt})$	10.59	1.51	12.11	3.72	11.06	3.62	-7.07	0.79

1/ Reported figures represent average differences in the corresponding variables between the numeraire country and the comparison group.

Table 7. Average Contributions to Differences in Economic Growth Rates 1/

Numeraire Country:	Guyana						Suriname	
	Caribbean Countries		HIPC Countries		PRGF-Eligible Countries		Caribbean Countries	
	1991-1997	1998-2004	1991-1997	1998-2004	1991-1997	1998-2004	1991-2000	2001-2004
Actual $(G_{gt-1} - G_{mt-1})$	5.50	-2.51	4.76	-3.71	4.16	-3.25	-2.24	2.04
Predicted $(G_{gt-1} - G_{mt-1})$	4.88	-1.47	4.32	-3.33	3.40	-2.19	-2.26	2.18
Contribution of								
$(\Delta Labor_{gt} - \Delta Labor_{mt})$	-0.17	-0.45	-1.75	-2.72	-0.61	-0.88	-0.02	0.30
$(\Delta Pol\_Risk_{gt} - \Delta Pol\_Risk_{mt})$	0.33	-0.16	0.66	-0.30	0.44	-0.16	-0.01	1.18
$(CF\_Private_{gt} - CF\_Private_{mt})$	-0.87	-1.45	-0.67	-1.67	-1.07	-1.89	-0.19	0.04
$(CF\_Public_{gt} - CF\_Public_{mt})$	4.83	5.18	1.84	1.34	2.26	1.73	-0.12	-0.13
$(FDI_{gt} - FDI_{mt})$	5.29	0.56	5.57	1.71	3.65	1.19	-2.12	0.24

1/ Reported figures represent percentage contributions to the average predicted growth rate differential arising from differences in the corresponding variables between the numeraire country and the comparison group.

**Figure 6. Residuals from Fixed Effects Regression in HIPC Sample**

Figure 7. Guyana: Means of Yearly Differentials

Figure 8. Suriname: Means of Yearly Differentials
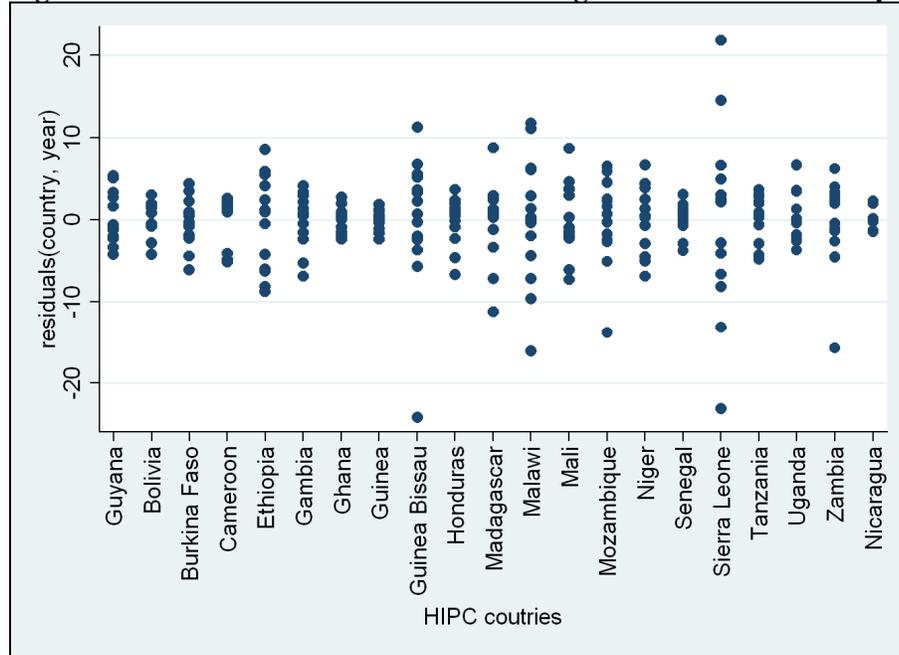
APPENDIX I. GROWTH ACCOUNTING AND DATA

I. The Growth Accounting Model

The growth accounting model assumes a production function with constant returns to scale and Hicks neutral technology, yielding a discrete time estimate of the growth rate of the Solow residual. GDP growth rates are calculated from data on Gross Domestic Product at constant 1988 prices reported in the World Economic Outlook database (see below). In the absence of data on the labor force and emigration, population data from the International Financial Statistics database is used as a proxy variable. The work force is assumed to be affected in an equivalent way as the general public by net birth and net emigration. While the labor force and, especially, skilled workers are more mobile, the data limitation makes this simplifying assumption necessary. The effect of migration might therefore be biased toward underestimation due to omitted effects on both the quantity of the labor force and (more importantly) on the quality of migrating workers.

For investment, the World Economic Outlook data on gross fixed capital formation at current prices, deflated by the GDP deflator, is used. Similarly to Weisman (2003), the capital stock is calculated by the perpetual inventory method:

$$K_{t+1} = I_t + (1-d)K_t$$

where d is the rate of depreciation, I is the gross fixed capital formation and K is the capital stock. The rate of depreciation is assumed to be 4 percent per annum. This rate is used by Weisman (2003) as well as Senhadji (2000) and is consistent with estimates of the consumption of fixed capital in the national accounts compiled by the Bureau of Statistics for Guyana.

To generate the series, an initial level of capital stock was assumed. Following Weisman (2003) approach, the capital stock in the year 1990 reaches G$16.06 billion in 1990 prices.[24] The capital share of GDP is assumed to be 0.5 which is broadly consistent with estimates by Sendhadji (2000) of 0.55 for 66 countries, and of 0.24 to 0.81 estimated for Latin American countries.[25]

In the growth accounting exercise, changes in the quality of labor and capital are ignored because of data constraints. This lack of differentiation concerning the quality of labor (i.e.,

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[24] Weisman (2003) uses 1951 as the base year and assumes an arbitrary amount of the capital stock of G$ 200 million (or G$ 9.8 billion in 1990 prices). He indicates that the series is not sensitive to the initial capital stock level because over time, it depreciates to zero.

[25] Experiments with different values for the capital share of GDP and the initial capital stock reported in Appendix II show that results of a qualitative shift in Solow residual remain unchanged.

by the level of education) and capital (i.e., in long-lived and short-lived capital) would tend to overestimate the Solow residual.

II. Data

Growth Rates for Guyana (Figure A1) and other Caribbean, HIPC, and PRGF countries were calculated from data on Gross Domestic Product (GDP) at constant 1988 prices from the World Economic Outlook (WEO) Database (W366NGDPR).

Labor Force size was proxied by population data from the International Financial Statistics (33699Z..ZF... F). Population growth rates are used as a proxy for the growth rate of the labor force (Figure A2).

For **Domestic Investment** we use data from the World Economic Outlook on gross public fixed capital formation (W316NFIG) and gross private fixed capital formation (W316NFIP). These series are redefined to be expressed as ratios to GDP (Figure A3). Domestic private investment ratios used in the analysis are further redefined to be expressed net of foreign direct investment.

Data on **Foreign Direct Investment** are taken from the World Economic Outlook Database. We used net foreign investment excluding debt-creating liabilities (W311BFDIX). FDI data are redefined to be expressed as ratios to GDP (Figure A4).

Evolution of **Political and Institutional Environment** is proxied by a Composite Political Risk Index constructed by the ICRG Risk Rating System. This rating system assesses the institutional situation in a country from political stability to the regulatory framework on a comparable basis. The ICRG index varies between zero and one hundred and is created by assigning risk points to a pre-set group of factors. The following risk components and weights are used to produce the political risk rating: Government Stability (12 points), Socioeconomic Conditions (12 points), Investment Profile (12 points), Internal Conflict (12 points), External Conflict (12 points), Corruption (6 points), Military in Politics (6 points), Religion in Politics (6 points), Law and Order (6 points), Ethnic Tensions (6 points), Democratic Accountability (6 points) and Bureaucracy Quality (4 points). The variable used in our analysis is the first difference of the ICRG Composite Political Risk Index (Figure A5).

Data on **Terms of Trade** are from the World Economic Outlook database - terms of trade for goods and services (W311TT). These series consist of indices reaching 100 percent in the year 2000. Terms of trades are defined as the price deflator for exports of goods and services over the price deflator of imports of goods and services. We define our terms of trade variable as the percentage change in the reported index.

Figure A1. Guyana: Real GDP Growth
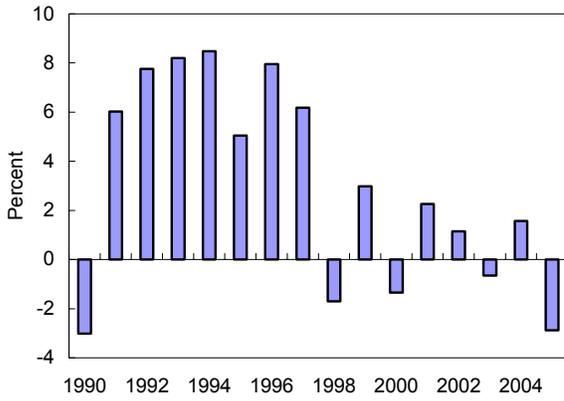
Figure A2. Guyana: Population Growth
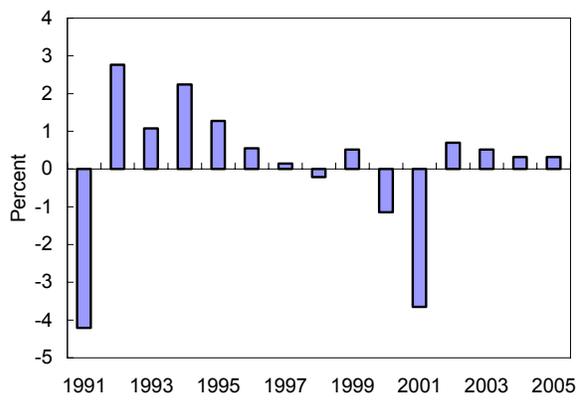
Figure A3. Guyana: Investment
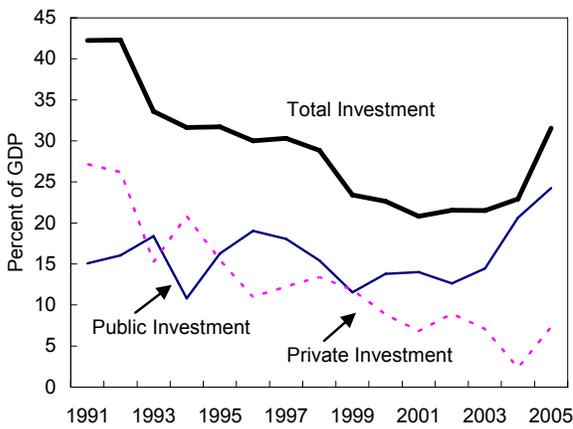
Figure A4. Guyana: Foreign Direct Investment
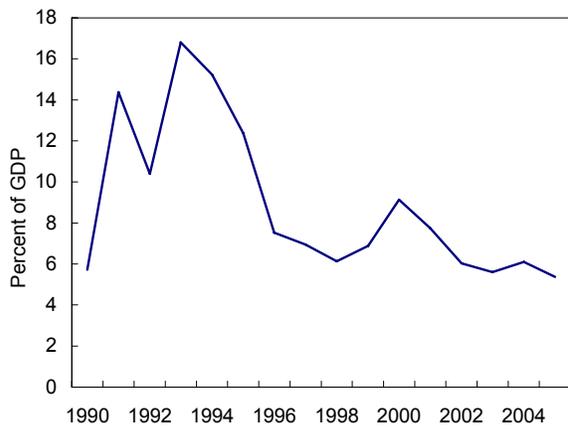
Figure A5. Guyana: ICRG Political Risk Index
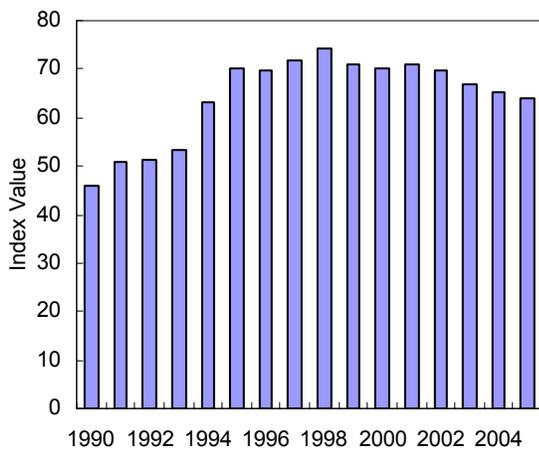
APPENDIX II. ROBUSTNESS EXERCISE

Since results of the growth accounting exercise can potentially be subject to the assumed initial value for capital stock, the exercise is repeated using different values of the initial capital stock. Figure A6 reports average Solow residuals for both sub-samples obtained when initial capital stock takes a value of 10, 16, 20, and 25 billion Guyanese Dollars (in 1990 prices). Similarly, we test robustness of our results to the assumed value of the capital share of GDP. Figure 5 shows average Solow residuals for the two sub-periods computed with a capital share of GDP varying from 0.3 to 0.6. For both robustness exercises, the general results are qualitatively similar to the ones already reported. While capital and labor accumulation is capable of explaining some part of growth deterioration in the post-1998 period, other factors have contributed favorably to economic performance of Guyana's economy in 1991–1997 and negatively in 1998–2004.

Figure A6. Solow Residual for Differential Initial Capital Stock Values
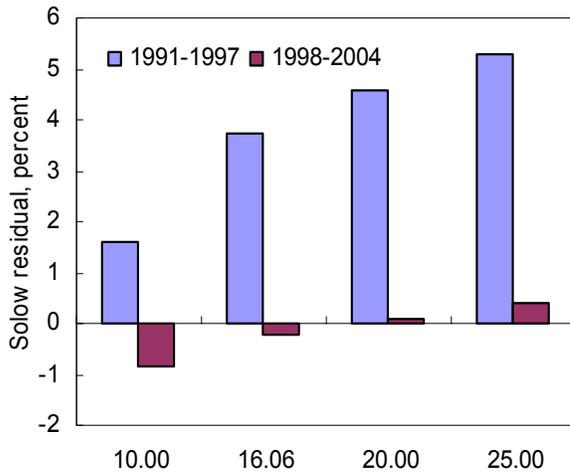
Figure A7. Solow Residual for Differential Capital Share of GDP
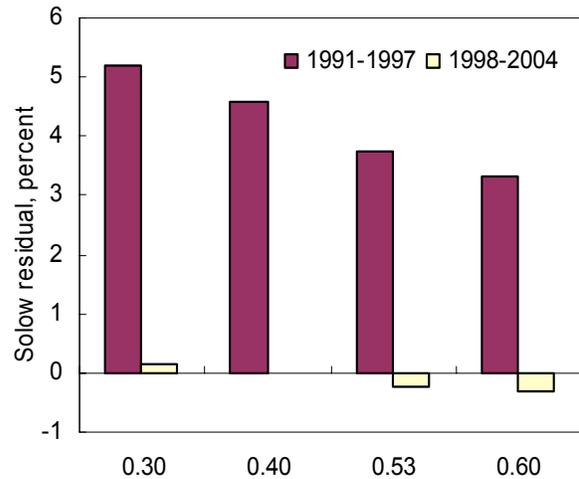
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