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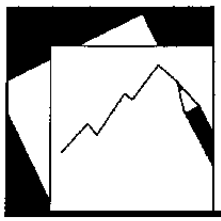

IMF Working Paper

The Challenge of Diversification in the Caribbean

Peter Berezin, Ali Salehizadeh, and Elcior Santana

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The Challenge of Diversification in the Caribbean

Prepared by Peter Berezin, Ali Salehizadeh, and Elcior Santana*

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Abstract

It is typically assumed that countries in the Caribbean suffer from a lack of output and export diversification. Contrary to this popular perception, we find no evidence that output variability is higher in Caribbean countries than in larger, more diversified, developing economies. In addition, we find no evidence that export earnings are more volatile in the Caribbean economies than elsewhere. In fact, export earnings are quite stable in the Caribbean, reflecting the fact the region is rather unique in that most of its export earnings are generated from service exports, which tend to be considerably less volatile than goods exports.

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Authors' E-Mail Addresses: pberezin@imf.org; asalehizadeh@imf.org; and elciors@iadb.org

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*The first two authors are in the IMF Asia and Pacific Department and Western Hemisphere Department, respectively, and the third author is currently at the InterAmerican Development Bank. They were all in the IMF Western Hemisphere Department when the paper was first drafted. They would like to thank, in particular, colleagues in the IMF Caribbean I and II Divisions for useful discussions and suggestions.

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I. INTRODUCTION

This paper examines the issue of economic diversification in the Caribbean region. Contrary to popular perception, the paper finds no evidence that output variability is higher in the Caribbean countries than in larger, more diversified, developing economies. In addition, we find no evidence that export earnings are more volatile in the Caribbean economies than elsewhere. In fact, export earnings are quite stable in the Caribbean, reflecting the fact the region is rather unique in that most of its export earnings are generated from service exports, which tend to be considerably less volatile than goods exports. Although consumption variability is higher in the Caribbean than in other regions of the world, the paper's estimates suggest that the welfare loss from consumption variability in the Caribbean is rather modest.

The outline of the paper is as follows. Section II describes a broad set of principles that are useful in understanding the costs and benefits of economic diversification. Section 3 describes the diversification experience in the Caribbean. It shows empirically that economic volatility is quite low in the Caribbean relative to other regions and that economic shocks in the Caribbean tend to be country specific as opposed to region specific. This suggests that there is ample room for improving risk-sharing arrangements in the region. Section IV evaluates past government policies in the region to spur diversification. The record is rather mixed. Although there have been a number of successful initiatives to enhance diversification, many resources have been squandered on ill-conceived projects in sectors that are uncompetitive on world markets. Section V describes some "sunrise industries" that offer Caribbean economies opportunities for further diversification.

II. KEY PRINCIPLES

There are diminishing returns to production diversification

In order to illustrate this concept, an analogy can be considered: choosing stocks in a portfolio. It is straightforward to show that the riskiness of a portfolio declines at a decreasing rate with the number of different stocks in the portfolio (See Appendix I for a numerical example). In other words, allocating one's savings across more assets will decrease risk, but the marginal benefit from extra diversification is a declining function of how diversified the portfolio already is. The same is generally true for production diversification. The reduction in aggregate income volatility from the addition of an extra industry in a country that has 10 industries will be roughly ten times as large as in a country that has 100 industries.

One can, of course, push the analogy too far. When one speaks of further diversifying a portfolio, one means that the existing savings should be allocated across a larger number of different assets. The size of the pie (one's savings) is kept fixed. When a country suffers from high unemployment and excess capacity, diversification can increase national income without drawing away resources from existing sectors. Resources that were previously idle become employed in the new sector. Thus, diversification, if done right, can lead to not only more pieces of the pie, but a larger pie itself. This qualification, however, reinforces the concept that there are diminishing returns to diversification. When an economy operates well

below capacity, diversification will not only decrease the variability of production, but will likely increase aggregate production as well. Further diversification, however, will be less beneficial since new sectors will only emerge if resources are channeled away from existing sectors.

The covariation in economic performance across sectors is critical

Returning to the portfolio example, it may be noted that increasing the number of stocks is only beneficial if returns are not perfectly correlated. If the price of all the stocks move together, diversification is worthless. Diversification is most successful when an asset is added to a portfolio whose return is negatively correlated with existing assets in the portfolio. If most of the stocks do well when the economy is strong, then one should pick a stock that does well when the economy is weak.

In terms of economic diversification, this implies that a country will gain more from diversification if output in the emerging sectors is not well correlated (and if possible, negatively correlated) with output in the rest of the economy. This implies that production diversification is not just about moving the economy into new sectors. Rather, it is about moving the economy toward sectors whose fortunes are not directly tied to the rest of the economy.

Diversification is not costless. In general, diversification will require that resources be channeled away from sectors that already have a comparative advantage

For an economy operating at full potential, further production diversification will necessarily mean diverting resources from existing uses so that they can be employed in new sectors. For small economies, such as those in the Caribbean, this poses a serious problem. Most Caribbean economies are too small to support more than a few key industries. Those sectors that already exist, like tourism, are likely to enjoy strong comparative advantages. If government policy to encourage diversification causes resources to be channeled away from sectors that enjoy a comparative advantage, this may impede efficiency.

Trade liberalization can both facilitate and impede diversification

As a country becomes more open to trade, there will be a tendency to specialize in those sectors that offer comparative advantages. Thus, on the one hand, trade liberalization can come at the cost of having a less diversified economy. On the other hand, an expansion of trade can produce new industries which can only exist if firms have access to large foreign markets. Furthermore, there is evidence that technological diffusion tends to be primarily embodied in trade and foreign direct investment (FDI) flows. Thus, increased trade and FDI can stimulate the growth of new sectors, thereby creating new comparative advantages that the country can exploit.

Which effect will dominate is largely an empirical matter. There is evidence that among developing countries, openness is negatively associated with diversification but positively associated with growth.[1] The positive association between openness and growth is particularly strong in small economies, suggesting that access to large markets is of paramount importance to the countries of the Caribbean.

Production diversification can either be horizontal or vertical

Typically, when one thinks about production diversification, one thinks of ways that a country can carve out *new* sectors of economic activity, a process best described as "horizontal diversification." An alternative, and often superior route, is to adopt policies that lead to diversification *within* sectors, which one might call "vertical diversification." The experience of Trinidad and Tobago provides an excellent example of vertical diversification. In the 1970s and 1980s, almost all of Trinidad and Tobago's oil revenues consisted of proceeds from the export of crude oil. Since the mid-1980s, however, Trinidad and Tobago has diversified its petroleum industry into oil and gas refining, liquid natural gas (LNG) production, and petrochemicals. The advantages of this diversification strategy have been twofold. First, Trinidad and Tobago has been able to enter more high value added industries, thus boosting income from the extraction of its nonrenewable resources. Second, the country is no longer as vulnerable to changes in commodity prices as it was in the past. When energy prices fall, for instance, the gas and oil industry understandably suffers. However, since energy is the key input in the petrochemical industry, petrochemical producers gain. These offsetting interactions help keep Trinidad and Tobago's energy industry on a relatively steady keel.

In practical terms, policies based on vertical diversification are often easier and less costly to implement than policies based on horizontal diversification. Horizontal diversification, by attempting to carve out completely new sectors, tends to be more heavy-handed. Vertical diversification, on the other hand, by building on the strengths of existing sectors, can exploit the synergies that already exist. A country that already operates a few tourist resorts will find it easier to expand into such activities as eco-tourism. As so many countries that have actively pursued state-led industrial policies have discovered, trying to develop sectors from scratch is an expensive, and often, fruitless pursuit.

One of the chief benefits of production diversification is that it reduces consumption variability

In an ideal world, households could smooth consumption perfectly over time by borrowing and saving, depleting or accumulating nonfinancial assets, adjusting labor supply, and by buying insurance.[2] For the economy as a whole, consumption smoothing would imply running a current account deficit when national income is temporarily low and running a

[1] Ades and Glaeser (1994).

[2] Morduch (1995).

current account surplus when national income is temporarily high. Thus, in an ideal world, production and consumption decisions are separable—production decisions are made to maximize expected profits, without any concern for risk.

Of course, the world is far from ideal. It has been shown that households in developing countries have developed a myriad of fascinating and intricate ways to pool risks.[3] Yet, these risk-sharing arrangements fall well short of providing full insurance against production variability. Although market economies, by freeing people from traditional entanglements such as the kinship group or the village hierarchy, can be very liberating, the development of market economies tends to obviate the role of traditional risk-sharing institutions, thus making it more difficult for households to pool consumption risks. As a result, as countries grow and market institutions pervade more aspects of society, the role of government in providing social safety nets to help smooth household consumption becomes increasingly paramount.

Just as it has been shown that households do not fully insure themselves against consumption risks, on the aggregate level, it has been well documented that countries are generally unable to fully insure themselves against temporary income shocks. Although much is made about how some countries run large current account deficits, perfect consumption smoothing would imply much larger external imbalances, usually by an order of magnitude greater than what is actually observed.[4] This fact is reflected in the famous observation that the rate of savings and investment in most countries is closely correlated.[5] If countries could smooth consumption perfectly, investment would flow to those countries that offered relatively high rates of return to capital, regardless of their savings rates.

Thus, efforts to diversify production should be seen as part of a larger problem: the inability of households and countries to smooth consumption. Production diversification is more useful when households and countries cannot fully insure themselves against income shocks. Hence, decreasing consumption variability should be regarded as an important goal of diversification. This can either be achieved by reducing consumption variability directly by strengthening intranational and international risk-sharing arrangements or indirectly by reducing production variability by encouraging economic diversification.

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[3] Townsend (1995).

[4] Obstfeld and Rogoff (1996), for instance, develop a model of a small open economy with a constant rate of productivity growth that exceeds world productivity growth. In their model, under a set of plausible parameters, after an initial period of heavy borrowing, the economy runs a steady trade surplus equal to 45 percent of GDP. Fernandez de Cordoba and Kehoe (2000) calibrate an intertemporal model to determine how Spain's current account should have evolved after its 1986 entry in the European Union. They find that the optimal response would have been to run a current account deficit of 60 percent of GDP, about 20 times greater than what was actually observed.

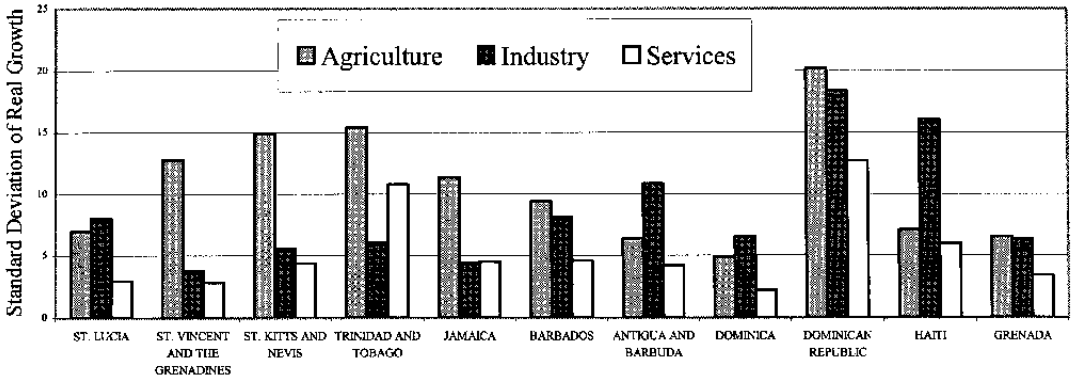
[5] Feldstein and Horioka (1980).

III. The Caribbean Experience

What are the sources of production variability in the Caribbean?

As Figure 1 shows, the variance of output in the agricultural sector in most Caribbean countries is very large. Indeed, most of the production variability that Caribbean economies experience is the direct result of the volatility that plagues their agricultural sectors. Regression analysis bears this out. A regression of the percentage share of agriculture on the logarithm of the standard deviation of per capita growth is statistically significant at a 10 percent level with an estimated slope coefficient of 0.154, suggesting that a 1 percent increase in the share of agriculture (from 6 percent to 7 percent of GDP, for example) is associated with 15 percent increase in total output variability.[6]

Figure 1. Agriculture Is Much More Volatile Than Industry or Services 1/



Source: World Bank (2000).
1/ Data cover 1981-2000 for St. Lucia, St. Vincent and the Grenadines, St. Kitts and Nevis, and Grenada; 1985-2000 for Trinidad and Tobago, Jamaica, Barbados, Antigua and Barbuda, Dominica, and Dominican Republic; 1991-2000 for Haiti.

There are four primary reasons why the performance of agriculture is so capricious in the Caribbean.

- Agriculture in most Caribbean countries is concentrated in only a few major commodities.[7]

[6] The slope coefficient was insignificant at the 5 percent level due to the low number of observations in the sample.

[7] Since the European Union (EU) grants preferential treatment to traditional agricultural exports such as sugar and bananas, this has reduced the incentive to diversify into new agricultural products.

- Agriculture is particularly vulnerable to natural disasters such as droughts and hurricanes.

- Food prices are subject to high variability. In fact, recent research suggests that variability of commodity prices has increased since the early 1970s.[8]

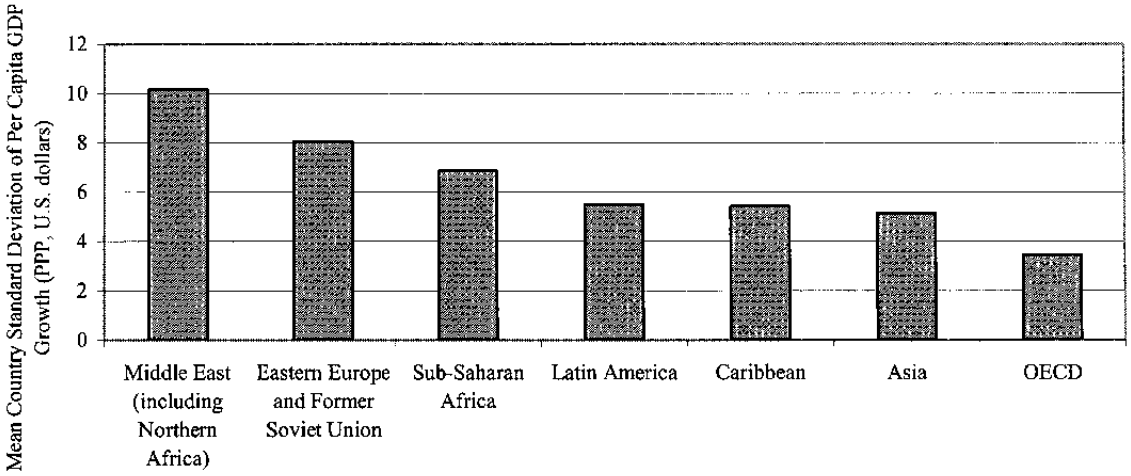
- The uncertainty surrounding preferential access to the EU market for the region's main agricultural exports has exacerbated volatility in the sector. For example, a 1997 decision by the EU deemed that Grenada's banana crop was unfit for European consumption. Since it is difficult to sell Caribbean bananas outside of Europe's protected markets, this decision almost led to a complete collapse of the Grenada's banana industry.

How does production variability in the Caribbean compare to other developing countries?

Presumably, the openness of their economies, their lack of export diversification, and their vulnerability to natural disasters would imply that income per capita in most Caribbean countries fluctuates more than in larger developing economies. Well, not quite. As Figure 2 shows, when ranked by standard deviation of real per capita GDP growth, Caribbean economies do particularly well. Among non-OECD countries, St. Lucia, St. Vincent and the Grenadines, and The Bahamas are among the top five most stable countries when ranked by standard deviation of per capita growth between 1981 and 2000. In fact, in a sample of all developing countries, there is no meaningful statistical correlation between a country's size, measured by its population, and the standard deviation of its real per capita GDP growth rate. Outside of the OECD, the country with the lowest standard deviation of real per capita growth in U.S. dollars between 1981 and 2001 was Fiji! Larger economies such as Brazil were prone to big swings in per capita income. Thus, bigger countries may be more diversified, but that does not seem to have reduced their vulnerability to income shocks.

[8] Cashin and McDermott (2001).

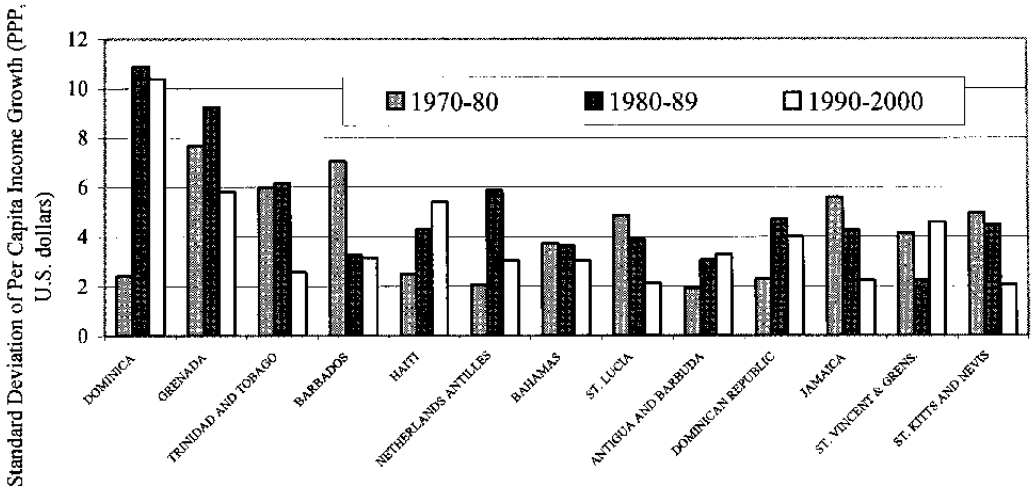
Figure 2. Income Volatility Is Quite Low in the Caribbean Region, 1969-2000



Source: IMF, *World Economic Outlook.*

Not only is output variability quite low in the Caribbean, it has been declining over time. As Figure 3 shows, for some countries such as Trinidad and Tobago, the decline in output variability in the 1990s has been dramatic.

Figure 3. Growth Variability in the Carribean Has Declined Over Time

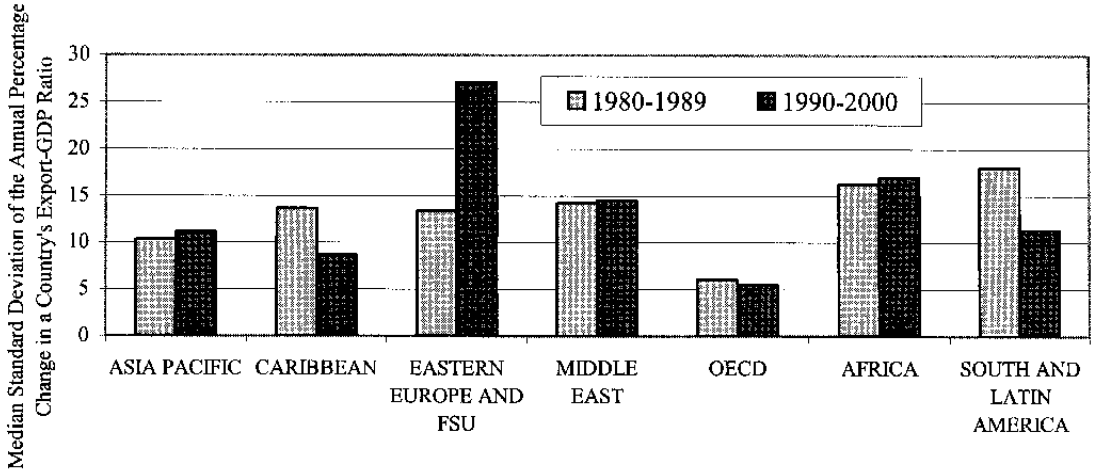


Source: IMF, *World Economic Outlook.*

Of course, output variability is not the only yardstick by which to measure whether a country or region is sufficiently diversified. An equally important metric, particularly for small open economies like those of the Caribbean, is the variability of export earnings. Just like output, the natural presumption is that export earnings are highly volatile in the Caribbean. Again, however, the data does not bear this out. In fact, exports of goods and services, as a fraction of GDP, are quite stable in the Caribbean. Figure 4 shows the median standard deviation of the annual percentage change in the export to GDP ratio for every region in the world, as

well the OECD economies. In the 1990s, with the exception of the advanced economies, the Caribbean region had the lowest median standard deviation of export earnings of any region in the world.

Figure 4. Variability of Exports of Goods and Services as a Percentage of GDP by Region



Source: IMF, *World Economic Outlook.*

What accounts for the relative stability enjoyed by most Caribbean countries? There are a number of factors, but five stand out. First, the English speaking part of the Caribbean, with the exception of Jamaica, has generally enjoyed a fair amount of macroeconomic stability, leading to relatively low inflation and relatively stable exchange rates.

Second, the region has mostly avoided large-scale social conflicts that have plagued so many other parts of the world. The region's success in avoiding wars and other major economic disruptions stems from the strength of the democratic institutions in most English-speaking Caribbean countries. Recent research has shown that democratic countries tend to be more stable and tend to grow more quickly.[9]

Third, as Figure 5 shows, although the agriculture sector continues to employ many people across the Caribbean, the contribution of this sector to national income has steadily declined in recent years. In 2000, only Dominica had an agricultural sector that accounted for more than 15 percent of GDP.[10] By limiting their exposure to agriculture, Caribbean economies have been able to maintain relatively stable growth rates.

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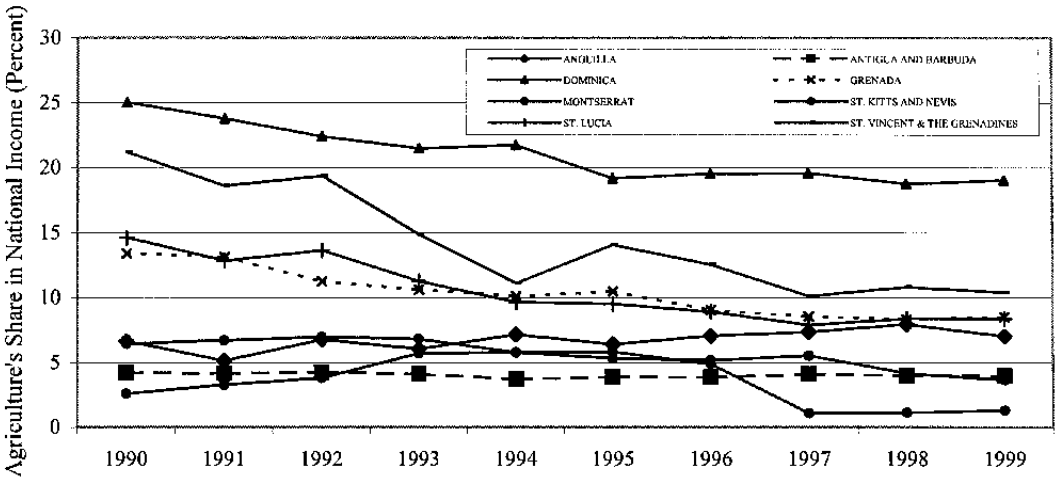
[9] Rodrik (1998).

[10] Dominica's agriculture sector, which is dominated by banana production, accounts for about 20 percent of GDP. Not surprisingly, Dominica has the highest standard deviation of per capita output growth of any country in the region.

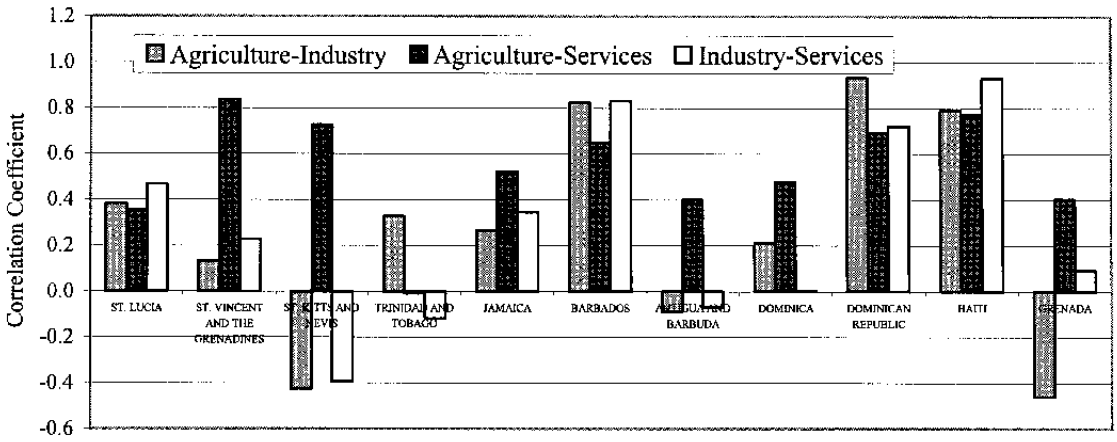
Figure 5. Agriculture's Share in the ECCB Is Quite Low and Has Fallen in Recent Years



Source: IMF staff estimates.

Fourth, as this paper argued in Section II, growth variability is lowest when output growth rates across sectors are not well correlated. As Figure 6 demonstrates, this appears to be the case, at least for the English speaking part of the Caribbean. The vertical axis measures the correlation coefficients across sectors. A number equal to "-1" implies that sector growth rates are perfectly negatively correlated. A number equal to "0" implies that sector growth rates are completely uncorrelated and a number equal to "1" implies that sector growth rates are perfectly positively correlated. For example, the correlation coefficient between Dominica's agriculture and industrial sector is 0.22. This means that a 1 percent increase in Dominica's annual growth rate in agriculture, on average over the course of the 1990's, coincided with a 0.22 percent increase Dominica's growth rate in industry.

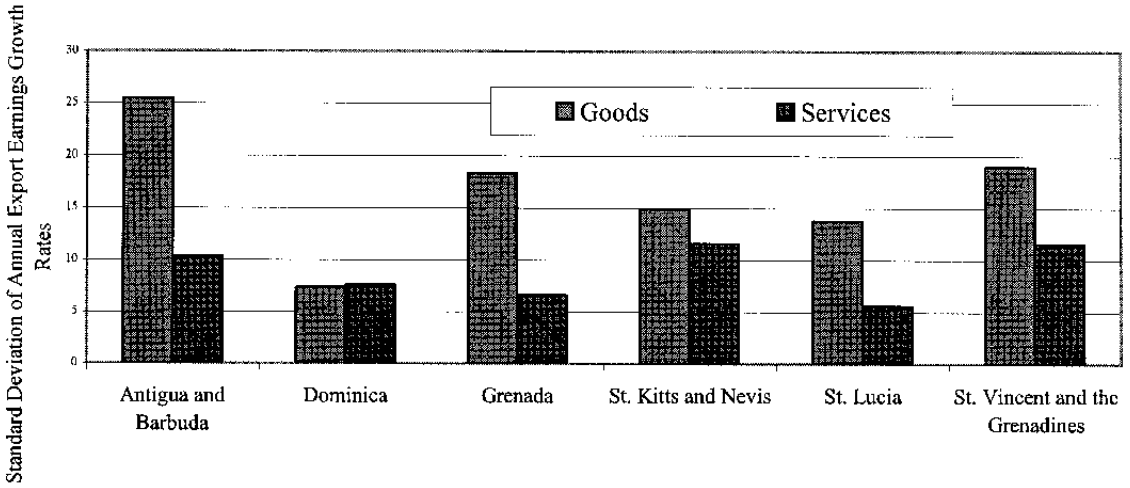
Figure 6. Output Growth Is Not Well Correlated Across Sectors



Source: World Bank (2000).
1/ Data cover 1981-2000 for St. Lucia, St. Vincent and the Grenadines, St. Kitts and Nevis, and Grenada; 1985-2000 for Trinidad and Tobago, Jamaica, Barbados, Antigua and Barbuda, Dominica, and Dominican Republic; 1991-2000 for Haiti.

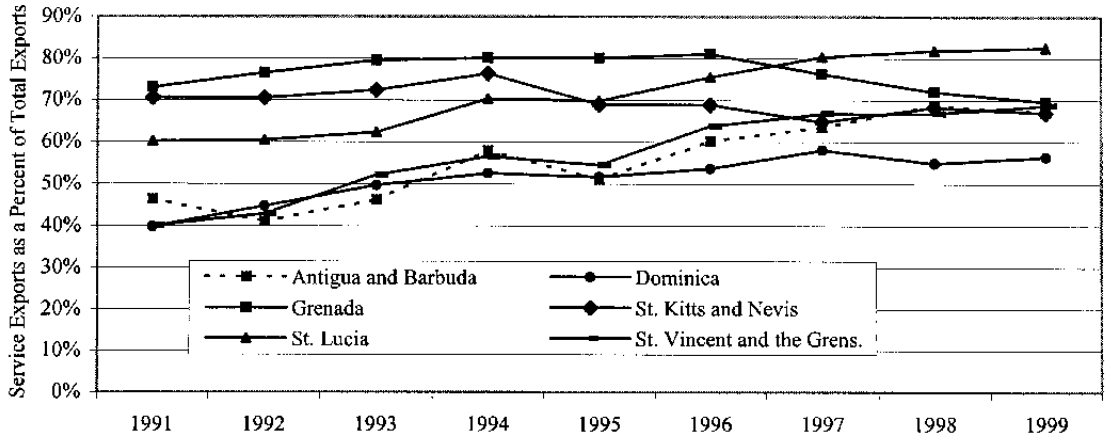
Fifth, the Caribbean region is rather unique in that most export earnings are generated from services (generally tourism and more recently, offshore banking). Although export earnings from goods have been quite volatile for most Caribbean economies, export earnings from services have been quite stable. Since service exports for most Caribbean economies are far higher than goods exports, this helps explain the relative stability of export earnings. Figure 7 and Figure 8 illustrate this point for ECCB area. For the six economies for which sufficient data are available, the average standard deviation of export earnings from services was 46 percent lower than of export earnings from goods. At the same, service exports accounted for the bulk of export earnings. Note that service exports have been rising over time relative to goods exports. This helps explain why income variability has generally been falling in the Caribbean region.

Figure 7. Service Export Earnings in the ECCB Region Are Less Volatile Than Goods Export Earnings, 1991-99



Source: IMF staff estimates.

Figure 8. Service Exports in the ECCB Region Exceed Goods Exports



Source: IMF staff estimates.

Are output shocks in the Caribbean region specific or country specific?

The Caribbean, when considered as a single economic entity, is far more diversified than each individual country within the region. This stems from the fact that there is tremendous heterogeneity across Caribbean economies, both in terms of economic structure and performance. Table 1 shows that although most Caribbean economies derive most of their merchandise export earnings from only one or two commodities, there is no uniformity as to what those commodities are across the region. St. Kitts and Nevis derives more than a third of its merchandise export earnings from sugar and rum. Dominica, St. Lucia, and St. Vincent

and the Grenadines, on the other hand, have no sugar exports. Instead, they derive more than a third of their merchandise export earnings from bananas. Trinidad and Tobago has a vibrant oil sector, while Jamaica and Suriname have large bauxite and alumina mining sectors. Thus, the lack of diversification in the Caribbean is largely a reflection of the large number of political entities in the region.

Table 1. Percent of Total Exports (Five-Year Average, 1995–99)

	Rum, Sugar, Molasses	Bananas	Citrus	Gold	Oil & Fuels	Chemicals	Bauxite & Alumina	Soap	Electronic Components	Machinery and Transport	Garments	Seafood	Spices	Cocoa	Timber & Lumber	Rice	Flour	Steel Products	Others
Antigua & Barbuda 1/	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
The Bahamas 1/	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Barbados	16.2					10.1			10.3										
Belize	26	13.8	18								9.6	9.9			1.1				
Dominica		32.3						30.1											
Grenada		5.4									4.8	13.7	22.0	11.9					
Guyana	24.6			22.1			15.6								2.2	14.5			
Jamaica	7.4						42.6				14.9								
St. Kitts & Nevis	35.0									50.9									
St. Lucia		41.3									9.9								
St. Vincent & the Grenadines		35.3														11.6	15.0		
Suriname					3.6		76.9					7.8				7.1			
Trinidad & Tobago					46.2	24.3												7.8	

Source: IMF staff estimates.
1/ Insufficient data.

To illustrate this point, consider the ECCU zone. The median standard deviation of per capita growth for economies of the ECCU for 1991–2000 was 3.2 percent, high relative to OECD economies but quite low among developing countries. For the ECCU zone as a whole, however, the standard deviation for per capita growth was only 1.4 percent, lower than for the United States (1.6 percent) and the United Kingdom (1.8 percent). There are two lessons to draw from this result. First, the ECCU region, when regarded as a single entity, is remarkably stable, even by the standards of OECD economies. This casts doubt on any claim that *the region* is insufficiently economically diversified. Second, since the median standard deviation is twice as large for individual countries within the region as for the region as a whole, this implies that most of the shocks that countries in the region experience are country specific and not region specific.

Another way to demonstrate that most income shocks in the ECCU zone are country specific is to construct a correlation coefficient matrix for per capita output growth rates. As Table 2 reveals, although the correlation coefficients are positive, they are far from one, implying that most shocks are country-specific. As we shall argue later in the paper, the dominance of country specific shocks implies that there is scope for further strengthening risk-pooling

arrangements both in the ECCU and in the wider Caribbean region. These results also imply that economic integration is, in some sense, a substitute for diversification. As a result, efforts to strengthen such regional institutions as CARICOM are likely to offer significant benefits. In particular, resource sharing arrangements, in which countries pay premiums into a centralized insurance scheme and draw monies if they are afflicted by a negative shock (such as a hurricane), have the potential to increase income security in the region.

Table 2. The Growth Performance Among Caribbean Economies Is Not Well Correlated

	Region	Anguilla	Antigua and Barbuda	Dominica	Grenada	Montserrat	St. Kitts and Nevis	St. Lucia	St. Vincent and the Grenadines
Region	1.00	...	...	...	...	...	...	...	...
Anguilla	0.46	1.00	...	...	...	...	...	...	...
Antigua and Barbuda	0.52	0.18	1.00	...	...	...	...	...	...
Dominica	0.59	0.15	0.16	1.00	...	...	...	...	...
Grenada	0.45	0.13	0.33	0.12	1.00	...	...	...	...
Montserrat	0.01	-0.25	0.30	-0.61	0.07	1.00	...	...	...
St. Kitts and Nevis	0.56	0.11	0.65	0.30	0.00	0.37	1.00	...	...
St. Lucia	0.29	0.22	-0.57	0.39	0.03	-0.49	-0.46	1.00	...
St. Vincent and the Grenadines	0.39	-0.05	-0.44	0.42	**0.18**	-0.11	0.06	0.60	1.00

Source: IMF staff estimates.

How does consumption variability in the Caribbean compare to other developing countries?

Although GDP growth is less variable in the Caribbean than in larger developing countries, the lack of strong institutional arrangements to mitigate consumption shocks may cause consumption to be more volatile in the Caribbean countries than elsewhere. This, in fact, is the case. In an influential study, World Bank economists Auffret and Mora-Báez calculated that the standard deviation of private consumption growth rates from 1960 to 1997 was 5.49 percent in the Caribbean, compared to 2.74 percent in Asia, 3.15 percent in Latin America, and 1.48 percent in the OECD nations.[11]

The crucial question is whether the relatively large variations in per capita consumption growth rates generate very large social welfare costs. Auffret and Mora-Báez estimated that for the period 1960 to 1997, the Caribbean region would have been willing to forgo more than half of their average growth to eliminate aggregate consumption variability.[12] For some economies, the numbers are even more striking. For instance, between 1960 and 1997, real consumption growth in Trinidad and Tobago averaged 1.22 percent. Auffret and Mora-Báez estimate that Trinidad and Tobago would have been prepared to accept real consumption

[11] CGCED (2000).

[12] World Bank (2000).

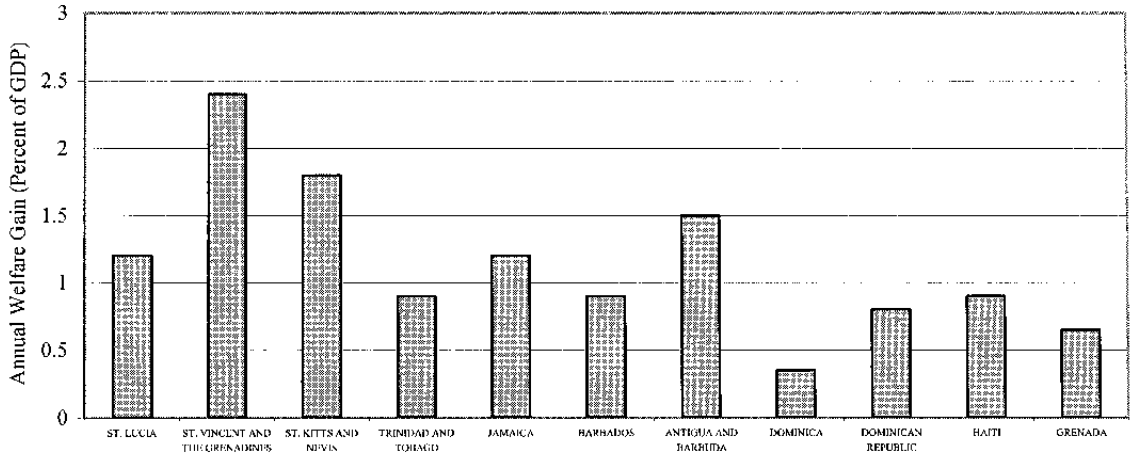
growth of only 0.14 percent (a difference of 1.08 percent) to eliminate aggregate consumption variability. Although 1.08 percent is not a lot for any given year, over a 40 year time span, it amounts to more than a 50 percent increase in average consumption!

These numbers are very large and, in the opinion of this paper, rather implausible. In sharp contrast to Auffret and Mora-Báez, this paper finds that welfare gains from eliminating aggregate consumption variability in the Caribbean are rather modest. This leads us to conclude that lasting increases in economic welfare require sustained increases in productivity and the implementation of policies that foster new sectors with the aim of reducing unemployment. Policies that smooth consumption, though desirable, are considerably less important than policies that promote growth. The results obtained in this paper differ from those obtained by Auffret and Mora-Báez due to what we believe is conceptual difference of opinion on how to properly measure consumption variability. Appendix II describes the methodology used in this paper to estimate the welfare loss from consumption variability in the Caribbean and how our assumptions differ from those of Auffret and Mora-Báez.

What are the welfare gains to reducing consumption variability in the Caribbean?

Figure 9 provides upper and lower bound estimates of the annual welfare loss from consumption variability for a selected number of countries as a percentage of GDP. As Appendix II points out, these estimates require that an assumption be made about the coefficient of risk aversion that should apply to people in the Caribbean. Although estimation of the coefficient of risk aversion has been the subject of numerous studies, there is no clear consensus on what that figure should be. Reflecting this lack of consensus, our estimates provide fair wide band between the upper and lower bounds. Although the welfare costs of consumption variability for Caribbean economies are not negligible, they are very modest compared to the welfare costs derived by Auffret and Mora-Báez.

Figure 9. Welfare Gain to Eliminating Consumption Variability in the Caribbean 1/



Source: World Bank (2000).

1/ For the Purposes of this calculation, the coefficient of relative risk aversion is assumed to be 3. As Appendix II shows, the annual welfare gain from eliminating consumption variability varies linearly with the coefficient of relative risk aversion. Thus, if the assumed coefficient of relative risk aversion were doubled, the annual welfare cost of consumption variability (as a percent of GDP) would also double. For Caribbean countries, however, even a doubling of this cost would be dwarfed by the benefits of a permanent increase in output growth.

Mechanisms to reduce consumption variability

Although the welfare costs of consumption volatility in the Caribbean are likely lower than previous estimates, they are far from trivial. As a result, it is worthwhile to consider various measures Caribbean countries can take to reduce the variability of consumption.

Improving financial markets

Well-developed financial markets channel funds from people who are net savers to people who are net dissavers. This helps reduce household consumption variability. At the same time, financial markets channel savings to firms with profitable investment opportunities. This raises investment and fuels growth. Another crucial benefit of well-developed financial markets is that they allow people to diversify their wealth across different assets. This paper has already noted that a critical prerequisite for the development of financial markets is that property rights be well established and well enforced. This will require Caribbean governments to take steps to reduce the size of their informal economies. Other worthwhile reforms include improving regulation and supervision of banks and nonbanks as well as harmonizing accounting standards regarding nonperforming assets and financial resolution mechanisms. Currently, there is much leeway in how authorities can handle financial institutions in distress. Transparent and predictable action plans to handle undercapitalized financial institutions would help deepen financial markets, reduce moral hazard, and lessen the risk to investors. Furthermore, there is a need for governments in the Caribbean to

maintain comfortable levels of foreign exchange reserves and secure lines of credit from foreign governments and banks. This will provide them with the necessary resources to weather unforeseen exogenous shocks.

Expanding catastrophe insurance

The Caribbean region is subject to a wide variety of natural disasters, including hurricanes, volcanic eruptions, and droughts. Given their small size, natural disasters tend to have disproportionately large effects on Caribbean countries. For instance, the cost to Jamaica from Hurricane Gilbert in 1988 was more than 33 percent of GDP. In contrast, the cost to the United States from Hurricane Andrew (the most expensive natural disaster in U.S. history) was only 0.2 percent of GDP.[13]

Caribbean countries have sought to reduce the adverse impact of natural disasters in two primary ways. First, they have engaged in disaster mitigation measures and vulnerability assessments with the aim of reducing the physical destruction of natural disasters. Second, they have sought to prefinance the damages that disasters cause. However, given the scope for massive losses from insuring natural disasters, Caribbean insurance companies have been reluctant to underwrite disaster risks. When policies are available, they tend to be very expensive with stringent coverage limitations. Those companies that offer disaster insurance typically transfer 85 percent of premiums to reinsurers, typically large foreign insurance companies with deep pockets. As a result, in a typical year, there are fairly large net outflows of capital from Caribbean insurance companies to foreign reinsurers. Of course, when a large disaster strikes the region, there is a net inflow of capital. However, recent research suggests that premiums for catastrophe insurance tend to be priced well above "actuarially fair" values.[14] In other words, the premium tends to be much higher than the expected loss. To lower premiums, Caribbean governments need deepen private insurance markets by harmonizing and enforcing regulatory standards. In addition, since most disasters afflict only one part of the Caribbean region, there is room for enhancing regional risk pooling arrangements between governments, perhaps under the auspices of CARICOM.

Strengthening social safety nets

Strong social safety nets are vital in mitigating consumption shocks, particularly for the poorest households. Many Caribbean countries suffer from high rates of poverty. Indeed, there seems to be compelling evidence that current social expenditures are inadequate. Although data for the Caribbean are not available, a recent survey of households in 14 Latin American countries revealed that an overwhelming majority favored increased expenditures on social programs.[15] More than 80 percent of respondents favored higher expenditure on

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[13] CGCED (2000).

[14] CGCED (2000).

[15] Rodrik (1999).

pensions and more than 70 percent favored higher expenditures on unemployment insurance. In contrast, less than 30 percent of respondents wanted increased expenditures on national defense. Interestingly, unlike richer countries, enthusiasm toward increased social spending was just as strong among high-income households as low-income households, suggesting a remarkable consensus that more needs to be done to strengthen social safety nets.
These facts suggest that the benefits from strengthening social safety nets in the Caribbean are likely to be large. Indeed, it is likely that most Caribbean residents would be prepared to pay higher taxes as long as they were assured that the money was spent wisely. It has been argued that the income tax system is "basic risk management."[16] People are less reluctant to pay taxes as long as they know that if something happens that temporarily prevents them from earning a living, they will receive government benefits. Such a broad-based insurance system could not be provided by private markets because of the adverse selection problem (if income insurance were privately provided, only high risk individuals would want to buy it, making the provision of such insurance prohibitively expensive for most people).[17] As a result it is the duty of governments to mitigate consumption shocks among households through prudent fiscal transfers from households that are doing well to households that have fallen on hard times.

Removing the NIS home bias

The National Insurance Schemes (NIS) in most Caribbean countries invest only in home assets. The rationale for doing so is based on the presumption that NIS assets invested domestically will increase the supply of savings, thus reducing domestic interest rates, hence spurring investment and growth. There are three main drawbacks to this approach. First, at a conceptual level, the riskless component of interest rates in small open economies such as those in the Caribbean ought to be determined in world markets. Thus, legal restrictions that force NIS schemes to invest their assets at home may simply lead domestic investors to invest more money abroad, thereby leaving domestic interest rates unchanged. Second, since public banks tend to be repositories for NIS funds, the inability of banks to invest NIS proceeds abroad increases their exposure to domestic risks.[18] Third, as the paper stressed in Section III, there is a great deal of variation across Caribbean economies both in economic structure and performance. This suggests that there are large opportunities for risk pooling within the Caribbean region that current NIS regulations thwart.

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[16] Shiller (1999).

[17] In Japan, the function performed by social programs and income transfers was partly supplanted by business policies such as the practice of offering workers *de facto* life-time employment.

[18] Juan-Ramon, Randall, Williams (2001).

IV. The Experience of Diversification in the Caribbean and Government Policy

The experience of diversification in the Caribbean

During the 1980s, the reduction in the demand for Caribbean exports, the fall of commodities prices, the reduction in the availability of external financing, and the increase in the costs of some inputs resulted in an important disruption of the region's economic structure and growth pattern. In addition, some events highlighted the importance of natural disasters [19] and the economic and social impact in the countries in the region.

Among the reasons for the decline of Caribbean exports in that period was the specialization of these countries in a few primary commodities (especially sugar and bananas) and the collapse of the international prices for those commodities (Figure 10).[20] In that period, goods export earnings fluctuated widely, and the existence of CARICOM did not reduce this volatility, given the limited importance of intraregional trade. Although the CARICOM regional agreement on industrial structure[21] has contributed to the formation of an industrial base, it has been insufficient to compensate for the structural vulnerability of those economies.

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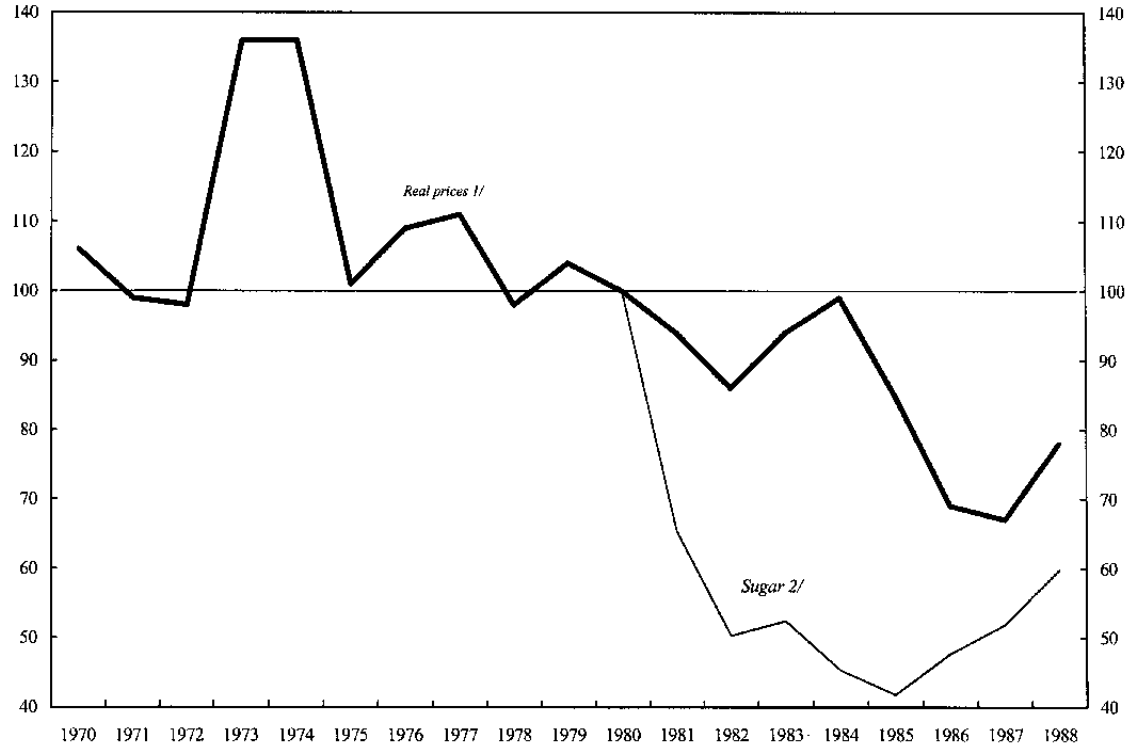
[19] Hurricane Allen, for example, destroyed over 90 percent of the Windward Islands banana crop in the beginning of the 1980s (Grosmann, 1994; Itam et al., 2000).

[20] Maizels (1992).

[21] The CARICOM treaty affirms that the member states should "undertake to promote a process of industrial development" that would "minimize product differentiation and achieve economies of large-scale production, consistent with the limitations of market size" in view of "the promotion of exports to markets both within and outside the Common Market." At the regional level, several agreements have been signed with the objective of promoting industrialization. Among the most important is the Agreement on Harmonization of Fiscal Incentives to the Industry, which has the following objectives: (i) to promote investment in industry; (ii) to reduce competition among members; (iii) to rationalize the criteria for granting incentives by targeting projects with high domestic value added; and (iv) to reduce inequity among members. The main incentives were: (a) profit tax holiday; (b) tariff exemptions; (c) export allowance for extraregional exports after expiration of tax holiday; (d) dividend payments; (e) loss carry forward; and (f) depreciation allowance. Also important was the Industrial Allocation Scheme for the Organization of Eastern Caribbean States (OECS), which aims to organize the distribution of production equitably across OECS countries. This scheme never really worked: the arrangement for the region was undermined by political pressure in each country for more job creation at the local level.

Figure 10. Commodity Prices, 1970-88 (Index 1980=100)



Sources: IMF Research Department Commodities Division, *Primary Commodities: Market Developments and Outlook*, March 1989.

1/ Nonfuel commodity prices adjusted by unit values of manufactured goods exports of developed market economies.
2/ Index weights: Free Market, 50 percent, European Community, 16 percent, United States, 34 percent.

In the 1980s, in spite of the difficulties in the international markets, the group of nonagricultural exports oriented to the extraregional markets expanded while the sectors focused in the traditional intraregional trade declined.[22] For the period 1990–99, although the growth rates were substantially lower, the region increased its extraregional exports for some of the nonagricultural items.

The main factors in the expansion during the 1980s were the preferential trading arrangements[23], the free trade zones (FTZ), and foreign investment. Preferential access has

[22] Extraregional exports of manufactured goods and chemicals increased by 685 percent and 187 percent, respectively, during 1980–89, in spite of a decrease in total extraregional exports by 44 percent in the same period.

[23] Among the most important was the Caribbean Basin Economic Recovery Act of 1983 (CBI) with the United States, and the Lomé Convention with Europe. The CBI—expanded in 2000 under the title of The Trade and Development Act—extends preferential tariff treatment (similar to NAFTA) to products such as textiles, wearing apparel, footwear, petroleum, handbags, luggage, and leather apparel. It adopted a duty-free and quota-free treatment for, among other items, certain textiles and

(continued...)

been essential to the manufacturing sector. The Caribbean Basin Initiative (CBI) has been an important factor behind the successful growth of export processing zones, such as those of Jamaica and the Dominican Republic in the 1980s. Nevertheless, after the creation of NAFTA, CARICOM's exports to the United States and Canada have stagnated and even declined. Furthermore, it is not implausible that in the future the manufacturing sector could face some difficulties as a result of the reduction in the common external tariff (CET) of CARICOM, new limits on preferential access to the U.S. and EU markets, and the liberalization process under the FTAA and the WTO. Those factors will increase the pressure on the competitiveness of the region which has, in the best scenario, a few years left to redesign and implement a new strategy. A WTO panel has already made a decision against the EU banana regime[24] in April 1999. The final agreement between the EU and the United States in April 2001 established that an adjusted system (transfers of 100,000 tons from the ACP banana quota to non-ACP countries) would be kept in place until 2006 when the quota system will be replaced by a flat-rate tariff. The result will be increased competition that will probably reduce the market share for this Caribbean export, with anticipated important economic and social impact as already verified by the contraction in recent years. The banana exports of the Windward Islands declined by 50 percent between 1990 and 2000; nevertheless, this product remains very important for the economic activity of these countries.[25] Given the current level of unemployment, a further reduction in this activity, without an alternative source of employment and income, could result in deterioration in the social and political situation. In an extreme scenario, it cannot be excluded that this trend could transform the drug problem that already exists in the region into a national security issue for some of those countries.

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wearing apparel articles assembled using inputs from the United States, certain handmade articles, and certain textile luggage. It also extended a duty-free treatment, but limited by quotas, to certain rum and certain apparel articles. The participation in the CBI is subject to periodic reviews that could include issues such as intellectual property rights, environment, and labor standards. The importance of the CBI is highlighted by the impending expiration of the Multifiber Agreement on January 1, 2005. The resulting increase in competition, as quotas are eliminated, makes the Caribbean geographic proximity to the U.S. market particularly important. The Lomé Convention defines the conditions and modalities of the cooperation between Europe and former colonies in Africa, the Caribbean, and the Pacific (also called the ACP group of countries). Starting in 1975 and expiring in 2000, the Convention provided duty-free access to almost all ACP exports to the European market. The successor agreement, signed in June 20000 in Cotonou, reaffirmed some European commitments to the ACP countries, although adjusted to comply with WTO rulings. The preparatory period will expire in 2007, and it is expected that there will be some profound changes in the way of doing business with EU. The Caribbean-Canada Agreement (CARIBCAN) grants duty-free entry to some products from the English speaking Caribbean with 60 percent of local content since 1986. It was updated in 1998 to include methanol, lubricating oils, etc.

[24] The EU banana regime restricts non-ACP banana producers through a system of tariffs and quotas and guaranteed market access to ACP producers up to 850,000 tons.

[25] For a critical view on the "banana dependency" in the Windwards Islands, see Welch (1994).

In addition to the need to respond to external shocks, new international policies have also contributed to the diversification of exports. Outsourcing has become an important instrument in the effort to increase competitiveness, and changes in telecommunication technology have increased the possibility of responding to this demand by providers around the globe. Caribbean countries are well placed to respond to the U.S. demand since they have the advantage of the language, same time zone, and cultural affinity. Nevertheless, those advantages are not enough to compete with other exporters in Asia and even in Latin America (e.g., Mexico).

The effort to diversify

The diversification process in the case of the Caribbean countries, resulted in a combination of "vertical" and "horizontal" type of diversification such as:

- Barbados: In addition to tourism and Free Trade Zone (FTZ), the country has developed offshore financial services and information processing, call center operations, GIS for mapping, software, international business corporations (IBCs), legal services related to international finance, and marketing/advertising/design services.

- Jamaica: After a lackluster experience in developing free trade zones, Jamaica is now in the process of developing the information technology (IT) sector. The entertainment sector has been another area that is expanding: the U.S. film industry brought US$50 million to the country in the 1985–93 period, and more than 50 recording studios are now active. In addition to tourism, other sectors such as health spas, call center operations, GIS for mapping, software, nontraditional crops (winter vegetables, ethnic foods, etc.) have increased their importance.

- Trinidad and Tobago: The country has developed civil engineering services, marketing/advertising/design services, musical instruments, oil and gas refining, liquid natural gas production, petrochemicals, management consulting, training, accounting, hotel design and construction, in addition to a dynamic tourism and entertainment sector focused on music and local traditions.

- Bermuda: In addition to tourism, which continues to be a very strong sector, the country concentrated on the financial sector (insurance, mutual funds, and IBCs).

- Cayman Islands: Even more than in Bermuda the focus is on the financial sector (insurance, IBCs, mutual funds, and banks and trust companies).

- British Virgin Islands: Health services, cosmetic surgery clinics, and tourism.

- Guyana: Audio text services.

- St. Lucia, and St. Vincent and the Grenadines: Besides tourism, electronic components targeting the U.S. market (CBI).

- Antigua: From sugar in the 1960s to tourism in the 1970s and offshore financial centers (OFC) in the 1980s and 1990s (mostly IBCs), and in the last four years to Internet gaming (57 enterprises in 2000).

- St Kitts: As in Antigua, the dominant activity evolved from sugar in the 1960s to tourism in the 1980s and offshore financial centers (IBC market leader) in 1980s/90s. Internet gaming (12 enterprises in 2000) and call centers are growing.

- Dominica: Still concentrated on the banana sector and coconut products. The effort to develop an offshore sector and an "economic citizenship" activity (selling of passports) did not succeed.

- Grenada: Has been trying to substitute sugar by other crops and spices, tourism, and data processing (started in the 1990s with FedEx).

Given the importance of banana in some countries (Dominica, St. Lucia, and St. Vincent and the Grenadines) and the likely restructuring of the industry, the EU and other donors are trying to accelerate diversification and establish safety nets. As a consequence of the changes in the international markets and the effort to diversify during 1980–99, the level and structure of intraregional and extraregional trade changed. On the import side, although the change in the distribution by intraregional and extraregional markets was modest (as a proportion of the total, intraregional imports increased from 9 percent in 1980 to 12 percent in 1999), the growth rate of intraregional imports during the period was significant (87 percent compared with 32 percent for extraregional imports).

This expansion of intraregional imports and the changes in the composition of trade corresponds to a deepening of regional integration. The Caribbean countries substituted some items previously imported from outside the region by products from the CARICOM, as illustrated by the performance of mineral fuels and lubricants for which intraregional imports increased by 86 percent while extraregional imports decreased by 59 percent (Figure 13). Confirming the process of diversification based on regional integration during the same period, the intraregional import of manufactured goods increased by 205 percent. At the same time, the structure of imports reflected a change in the regional demand: machinery and transport equipment increased their share to 28 percent of total imports in 1999 from 20 percent in 1981 due to a growth rate of 82 percent in imports from outside the region.

Government policies to encourage diversification

The Caribbean countries have used a combination of elements to respond to the need for diversifying production and increasing productivity. They include trade policy regimes determined at the national level and regional trade policy established by the CARICOM. The CARICOM Agreement defines: (i) a special regime for developing countries; (ii) the conditions for trade among members, including duties, rules of origin, and quantitative restrictions; and (iii) a common policy to protect members in relation to extraregional countries including CET, duties, and quantitative restrictions. Industrial policy regimes also

have been an important aspect of those institutional determinants of diversification, with elements that include a system of harmonized fiscal incentives (especially in relation to LDCs), regional programming, and national policies.

The incentives used by the government can be grouped in the following categories: (i) export subsidies; (ii) fiscal incentives; (iii) investment allowances; and (iv) worker training programs. Overall, the incentives in the smaller Caribbean countries are concentrated in garments, food processing, and electronics. In the larger and more developed countries, the incentives have been focused mainly in plastics, electronics, and gas and petrochemicals.

The main instrument that governments have used to provide incentives for exporters of services has been the tax exemption for importing technology. In Barbados, for example, imports of technology could be subject to taxes of zero to 65 percent. However, a financial service or informatics service exporter set up as an IBC would pay no tariffs or taxes on hardware or software in addition to being subject to a lower tax rate. Incentives also apply to: (i) a health spa or retirement community, which is subject to a reduced rate of stamp tax (15 percent instead of 20 percent); (ii) imports of medical equipment, which are free of taxes and tariffs; (iii) IBCs, which pay an income tax of only 2.5 percent and are exempted from all indirect taxes; and (iv) exporters, who are eligible for rebates of consumption or VAT taxes.

In general the free trade zones are exempt from taxes and are allowed duty free importation of inputs—in addition to the infrastructure facilities. In Trinidad and Tobago, exporting firms outside FTZ that meet specific conditions (concerning foreign exchange earnings, employment, technological development, and use of raw material) are also eligible to receive a rebate on income tax of 15 percent of taxable income. Also exporters are eligible for rebates of consumption or VAT taxes.

In the OECS countries, the "Fiscal Incentives Act" which covers manufacturing and services, defines tax holidays and exemptions from customs duties, consumption taxes and stamp duties on imports. Health tourism facilities, that are residential and large enough, can qualify to receive tax benefits ranging from accelerated depreciation to tax holidays. There are also special incentive programs for service exporters in the data entry field.

The fiscal situation in the Caribbean countries has raised some questions concerning the sustainability of the incentive mechanisms used in the diversification process. The incentives seem to have had an effect in attracting investments in nontraditional activities, presumably because they cover higher cost of labor and utilities as well as the risks of external shocks (including natural disasters). Nevertheless, in many cases the new firms have fled the country as soon as the incentives are reduced or eliminated, as established in the original agreement.

The fiscal impact of this trend is worsened by the diminishing revenues resulting from the reduction in tariffs associated with the liberalization process. In some cases, the resistance toward moving the system to a VAT (or even the regression from a VAT to tariffs on imports, as done recently by Grenada) could be related more to a perception of fiscal constraints and pragmatic considerations associated with the difficulty in finding alternative sources of revenue than to an ideological position.

In general, the result of this fiscal strategy to promote diversification can be positive if the reduction in fiscal revenues is temporary and if the strategy generates new activities. When those conditions are not satisfied, the result tends to be an increase in the debt and/or a fiscal crisis. The latter can become worse if governments increase the number of public employees in an effort to compensate for the unemployment resulting from the substitution of traditional exports by the new ones.

In addition to the fiscal mechanisms, the governments in the region have put in place a more favorable business environment to enable regional firms to compete in international markets. In some cases, the governments have been more aggressive, directing specific policies to certain sectors or firms, as in the case of Trinidad and Tobago's development plans in the 1970s and 1980s. In other cases, governments have used a less direct approach focused on providing public goods such as transportation, education, communication, and the regulatory and legal framework. Barbados developed an "IT Strategy Plan, 1994–2004" to create an infrastructure through IT skill building and telecommunications reforms. In five OECS countries, the recent introduction of modern telecommunications laws and the creation of a regional telecommunication regulatory agency have already resulted in a reduction in telecommunications costs.

In many of the Caribbean countries, the provision of infrastructure by the government was an important element in the decision-making process of the international corporations. The free trade zones (or more recently the Digiport in Jamaica) are a good example of the costs and benefits of such policies.

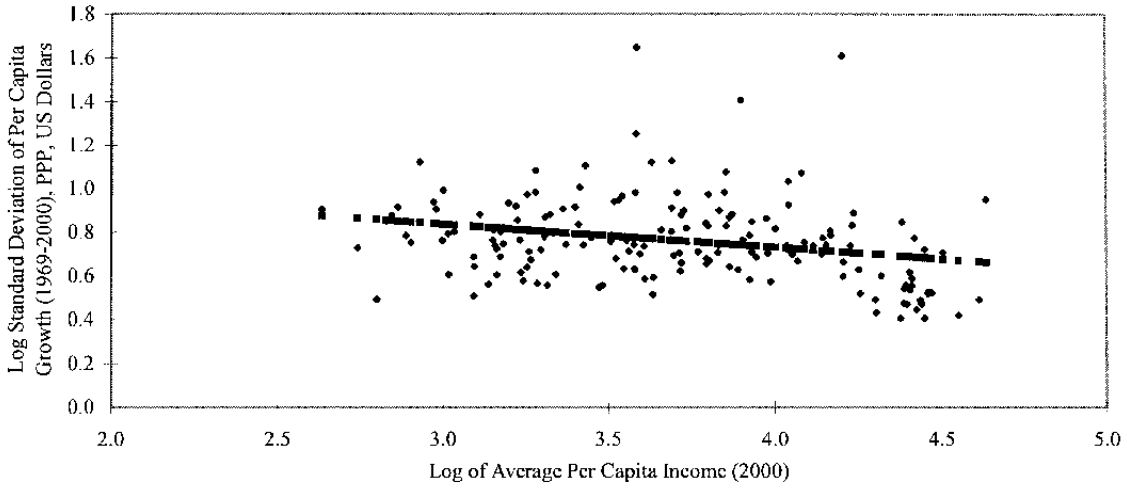
Foreign direct investment has been an important factor in the diversification process and it has been concentrated in energy, mining, tourism, and more recently in labor-intensive, medium- to low-technology manufacturing such as electronics, garments, and data processing. In the last ten years the FDI to the Caribbean countries almost tripled, amounting to more than US$1.5 billion in 1999, and several of the CARICOM members ranked well above average worldwide in terms of FDI as a percentage of GDP or GDP per capita. In addition, special access to the U.S. market, infrastructure and incentives by the governments, and the liberalization of the norms and regulations concerning capital movements in the Caribbean have contributed to the diversification and consolidation of nontraditional activities. Nevertheless, in some countries there are still several important restrictions to the participation of foreign investment: (i) some activities and areas are closed to foreigners; (ii) there are some restrictions on land use by foreigners; and (iii) withholding taxes on nonresidents' dividends and interest income are higher.

An evaluation of policies to stimulate diversification through economic growth

As noted in Section III, there is no meaningful correlation between country size (measured by population) and production variability. Big countries are just as likely to experience large swings in GDP growth rates as small countries. There is, however, a statistically significant negative correlation between production variability and per capita income. As Figure 11 shows, rich countries are generally stable and have correspondingly lower growth rate

standard deviations than poorer countries. This suggests that output stability in the Caribbean will likely increase as long as countries continue to adopt policies conducive to growth. In this section, we evaluate the Caribbean experience in five major policy areas that are considered critical to growth—education, foreign direct investment, infrastructure, law and order, and property rights.

Figure 11. High Income Countries Have Less Volatile Incomes



Source: IMF, *World Economic Outlook.*

Education

Although increased investment in education is typically regarded as indispensable for faster economic growth, recent research suggests a more sobering analysis. In a variety of cross-country growth regressions, while growth and physical capital accumulation turn out to be strongly positively correlated, the relationship between growth and human capital is more tenuous.[26] Indeed, one only needs to recall Robert Barro's infamous result that human capital for women is *negatively* correlated with growth to realize that the empirical link between education and growth is far from robust.[27] Looking at specific countries, there are examples of countries that have failed to achieve solid growth but have well-educated populations (Russia, for instance), as well examples of countries that had low initial levels of education but have nonetheless experienced strong growth (Thailand, for example). Freeman notes that China, despite destroying much of its human capital during the Cultural Revolution and having a very low rate of return to schooling during the 1980s, still managed to grow very rapidly.[28]

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[26] Pritchett (1999).

[27] Barro (1997).

[28] Freeman (1999).

Despite these qualifications, it is difficult to imagine how any country can achieve sustained improvements in living standards without improving access to education for its citizens. How well do Caribbean countries perform in educating the young? Relative to other countries in their income groups, Caribbean nations do a good job of providing primary education to their populations. In 1997, Trinidad and Tobago's net enrollment rate in primary education was 99.9 percent[29] and Barbados' was 97.4 percent. The average for upper middle income countries was 87.3 percent. Jamaica, which was ranked in low middle income group, had a net primary enrollment rate of 95.6 percent. High enrollment rates in Caribbean countries are reflected in their low illiteracy rates. Trinidad and Tobago has an adult illiteracy rate of 6.9 percent, compared to an average of 11.3 percent for upper middle income countries. Jamaica had an adult illiteracy rate of 14 percent, compared to average 16.5 percent among low middle income countries.

Of course, in modern, knowledge-driven economies, young people need more than a primary education to succeed. Unfortunately, the success of primary education in the Caribbean does not extend to the post-secondary level. Although the data on secondary and tertiary education for most Caribbean countries is lacking, there is clear evidence that most students do not continue their schooling beyond the secondary level.[30] Why is this the case? The most obvious answer is that most people in the Caribbean cannot afford to stay in school beyond their teenage years. Although no doubt there is much truth to this claim, it is not the entire story. The incentive to stay in school depends crucially on the private rate of return to education. Contrary to neoclassical theory, a variety of studies have shown that the return to human capital is greatest in areas where it is *abundant*.[31] In contrast, the return to human capital tends to be lower in areas, such as the Caribbean, where it is relatively scarce.

Estimates of the private return to education in Trinidad and Tobago, one of the region's most dynamic and successful economies, show that males of African decent faced a rate of return to education of 5.7 percent[32] while males of Indian decent faced a rate of return to education of only 2.9 percent.[33] These results stand in contrast to the United States, where it is

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[29] Net enrollment ratio is the ratio of the number of children of official school age (as defined by the education system) enrolled in school to the number of children of official school age in the population. Primary provides the basic elements of education at elementary or primary schools.

[30] World Bank: A Caribbean Education Strategy. For example, the secondary school completion rate in Jamaica was 42 percent and in Trinidad and Tobago, 33 percent. Typically, secondary school completion rates average about 80 percent in OECD countries.

[31] Lucas (1990).

[32] In other words, an extra year of schooling, on average, raises annual wages by 5.7 percent for males of African decent.

[33] Coppin and Olsen (1998). Given the relatively low rate of return to Indian males, it is not surprising that Indian males averaged fewer years of schooling. The lower rate of return to education for Indians reflects the fact that the Indian population in Trinidad resides primarily in rural areas while the African population resides primarily in urban areas, chiefly in the country's largest city,

(continued...)

estimated that the rate of return to an extra year of education is about 8 percent. It seems, therefore, that most people in the Caribbean avoid higher education not because governments have failed to emphasize schooling but rather because the private return to education is quite low.

This does not mean that an increased focus on expanding tertiary education is a bad idea. It *may* be the case that the social return to tertiary education in the Caribbean is very high. In other words, the decision to pursue a post secondary education in the Caribbean may yield positive externalities that the person receiving the education does not capture. Although it is natural to assume that the social return to education is positive, this is not a foregone conclusion. If a country subsidizes tertiary education, this will serve as a tax on those who choose not receive higher education. Furthermore, some of the private returns to tertiary education are likely to arise from its signaling value; even if extra schooling does not make students more productive, it does signal to potential employers that the student is competent. If employers cannot easily determine the competency of job seekers, then extra schooling may provide a way for competent job seekers to prove their worth to potential employers. This will impose a negative externality on job seekers who do not pursue a tertiary education, thus reducing the social return to education. Attempts to estimate the social rate of return to education in a variety of countries have had mixed results. Some earlier studies showed that the social return to education in developing countries is quite high.[34] More recent studies suggest, however, that the social return to education may be greatly overstated.[35]

One factor that has almost certainly depressed the social return to education in the Caribbean is the incessant outflow of educated workers from the region. Data from the 1990 U.S. census reveal that 159,913 Jamaican immigrants resided in the United States, a number equal to about 15 percent of the Jamaican population.[36] The numbers are even more striking when broken down by education. The census data showed that 23 percent of Jamaicans[37] with a secondary education resided in the United States and 67 percent of Jamaicans with a post-secondary education resided in the United States. In contrast, less than 1 percent of people born in Jamaica with primary education or less resided in the United States. The numbers are similar to other Caribbean countries. For instance, 57 percent of the people born in Trinidad

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Port of Spain. Presumably, better education yields a low return if one is employed in the agricultural sector where higher education is not necessary for most jobs.

[34] See Psacharopoulos (1994), for instance.

[35] See Freeman (1999) for a good discussion of the social return to education in sub-Saharan Africa. Acemoglu and Angrist (1999) find that the social return to education in the United States is close to zero.

[36] Carrington and Detragiache (1998).

[37] "Jamaicans" are classified as people born in Jamaica, even if they had U.S. citizenships at the time of the census.

and Tobago who had a post-secondary education lived in the United States. These numbers probably understate the severity of the problem since a sizable fraction of Caribbean immigrants settle in Canada and the United Kingdom. Thus, Caribbean countries run the risk of devoting scare resources to expanding tertiary education for their citizens only to have them leave once they complete their schooling.[38] Hence, policies aimed at expanding education, though necessary for sustained growth, are unlikely to be sufficient. Clearly, what is also needed is the sort of economic environment that will attract firms that require well-educated workers.

Foreign direct investment

For small open economies, such as those of the Caribbean, foreign direct investment plays a vital role in economic diversification. As an example of how FDI can stimulate new industries, one may consider Grenada's manufacturing sector. The sector is dominated by a single firm, W & W Electronics, which provides electronics assembly, manufacturing and testing services to companies such as Compaq, IBM, Cisco, Texas Instruments, Intel, Sun, Ford, and Chrysler. Based in Florida, W & W moved assembly operations to Grenada after the Montserrat volcano terminated operations on the island in 1997. The success the company has enjoyed in electronics assembly in Grenada has spurred it to diversify into new areas, such as spice processing. If Grenada had not adopted an open arms approach to foreign direct investment, it is unlikely that W & W would have chosen to locate in the country.

Beyond bringing new industries and cutting edge technologies to less developed countries, FDI is beneficial for other reasons. First, FDI flows are less volatile than other international capital flows. In fact, one might argue that the production volatility that arises from too great a reliance on short-term capital flows is far greater than the production volatility that arises from a lack of economic diversification.[39] Second, there is considerable evidence that foreign-owned firms pay higher wages than locally owned firms, even after controlling for worker-specific and industry-specific characteristics. Third, it has been documented that foreign firms tend to seek out better educated workers. This boosts the private return to education, thus encouraging people to stay in school beyond the primary level. Fourth, there

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[38] There are, of course, benefits to Caribbean countries from outward migration. People who leave reduce the supply of labor back home, thus decreasing unemployment and the fiscal burden of social assistance. Furthermore, the large supply of Caribbean expatriots ensures that a steady stream of remittances flow back to the islands. In addition, there is much research that suggests that ethnic groups living outside their country of origin help create formal and informal networks that spur trade between the host country and the mother country. For instance, one recent study finds that the presence of ethnic Chinese networks in a host country increases bilateral trade between the host country and China by at least 150 percent [Rauch and Trindade (1999)].

[39] Indeed, during the Mexican and Asian financial crises, FDI flows, unlike other capital flows, remained positive. Foreign firms were able to redirect sales from local markets to export markets. Furthermore, foreign firms benefited from the crisis-induced devaluations since this reduced the cost of labor in host countries (see Lipsey, 2001 for details).

is evidence of "spillover" effects from FDI on the wages paid at domestically owned plants. For example, one recent paper finds that domestic firms in Indonesia were forced to raise wages to compete for labor with foreign firms who built or bought plants in Indonesia.[40]

A common strategy in the Caribbean has been the establishment of industrial or free trade zones, which provide numerous tax-free concessions to foreign investors. The Montego Bay Free Trade Zone in Jamaica has succeeded in attracting a large number of investments. An information digiport was established with the aim of fostering investment in information processing. Barbados has also managed to attract investment in this area and St. Lucia has actively promoted a number of free trade zones.

Numerous concessions and incentives are offered in these zones, e.g., basic infrastructure facilities including utilities and communications, fiscal incentives providing for multiyear tax holidays, unrestricted repatriation of profits and duty-free importation of raw material inputs. However, it is unlikely that the multitude of fiscal incentives will be a major determinant of foreign investment, particularly in the IT sector. This is because investors look at competitive factors such as labor and telecommunications costs, availability of skilled labor, regulations supporting labor flexibility and mobility, provision for quality and competitive infrastructure services, and an enabling legal and institutional environment. If anything, the plethora of incentives for different categories of investors in industrial parks may raise uncertainty regarding the stability of concessions and the government's long-term plans. Simple, transparent, and less distortionary incentives give clear signals for long-term investment. In addition, an increased focus on reducing legal and administrative barriers would prove beneficial. One example is the need to eliminate the special property tax on foreign acquisition of land. Such taxes reduce the region's competitiveness in attracting retirees and retirement communities. In some countries, the higher withholding taxes on nonresidents' dividends and interest income also have a negative impact.

Infrastructure

The return to improving infrastructure in developing countries is very large.[41] Better roads and bridges allow goods and services to be transported within the country more readily and more safely. Better airports and seaports facilitate international trade, thus allowing countries to reap the rewards of global integration. Improved communication facilities, such as fixed line and cellular networks, help reduce the cost of business. Robust electricity grids ensure that firms have a reliable source of power. Good sewage facilities help thwarts the spread of disease. The list can go on and on.

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[40] Lipsey and Sjoholm (2001).

[41] Recent work suggests that developing countries would benefit by shifting their infrastructure budgets away from headline-grabbing new projects and focusing more on maintaining existing infrastructure. Hulten (1996), for example, finds that inadequate maintenance of existing infrastructure imposes a large growth penalty on developing countries. However, he finds no evidence that countries incur a growth penalty if they decrease spending on new infrastructure projects.

Along with the direct benefits from improving infrastructure, there are a variety of indirect benefits. For example, recent research has documented that firms in developing countries hold raw material inventories that, on average, are between two to five times larger as percentage of sales than firms in the United States. [42] Why is this the case? A primary reason why firms hold raw material inventories is to hedge against risks in the supply chain. If a construction company depends on imported timber but delivery of the timber is jeopardized by poor transportation facilities, then the company will find it necessary to keep a lot of lumber in inventory in case the shipment is delayed.

The cost to producers in developing countries of holding large inventories is very large. Firms in developing countries typically hold inventories in excess of 30 percent of GDP. If a developing country could successfully reduce this number to 15 percent (approximately what it is in the United States), then assuming a real interest rate of 10 percent (as a proxy for the opportunity cost of holding inventory), this would imply an annual gain to the economy of 1.5 percent of GDP, which is more than what many countries spend on transportation infrastructure each year. In other words, improving transportation infrastructure in many Caribbean countries would undoubtedly help stimulate growth. This, in turn, would generate resources that could be used further to stimulate diversification.

A modern telecommunications system is vital for dynamic open economies. This is especially relevant if trends in the Caribbean confirm the increasing importance of service exports. The monopolistic structures that still exist in some countries are not consistent with a sustainable long-term development. The strengthening of the technical capacity of regulators and the modernization of the legal and regulatory framework and institutions will be crucial. There are some possibilities for regional solutions: an example is the recent introduction of new telecommunications laws in five OECS countries and the creation of a regional telecommunications regulatory agency. These reforms have led to a reduction in telecommunications costs.

Law and order

It has been argued that less developed countries can attain prosperity only by improving their "social infrastructure." [43] Good social infrastructure ensures that the private returns and the social returns to productive activity are roughly the same. The primary elements of social infrastructure are institutions and laws that delineate and enshrine property rights and thwart lawlessness and corruption. When wealth is subject to expropriation or theft, the private return from engaging in wealth-creating activities will be much lower than the social return. As a result, not enough resources will be channeled into these activities.

A variety of theoretical models suggest that more than one equilibrium may exist in determining what fraction of a population engages in "wealth creation" and what fraction

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[42] Guasch (2000).

[43] Hall and Jones (1999).

engages in "predation." [44] If most of your neighbors are thieves, the payoff from engaging in wealth creation is bound to be low since whatever wealth you create is likely to be stolen. Hence, you are more likely to become a thief yourself. On the other hand, if most of your neighbors are wealth creators, you are unlikely to have your wealth stolen and so, you are more likely to become a wealth creator yourself. Furthermore, the probability of being caught if you are a thief is likely to be lower when most people are thieves themselves. These self-reinforcing processes suggest that government policy is crucial in determining whether a society will become rich through wealth-creation or whether it will be fraught with lawlessness and graft.

Empirical evidence on corruption suggests that even in countries that tend to be ranked as very corrupt, such as the Ukraine and Russia, corruption payments as a percentage of profit or sale are fairly small. Nevertheless, a number of researchers have found that uncertainty about corruption payments is more of liability than the average size of the payments. In other words, what investors dislike most is the arbitrary nature of corruption. As one recent study put it, corruption is much more "taxing than a tax" and consequently, has a large adverse effect on growth.[45]

Although there are no empirical studies linking the impact of corruption on economic growth in the Caribbean, even a cursory look at the country corruption rankings produced by such organizations as Transparency International suggests that less corrupt countries in the Caribbean tend to enjoy much higher per capita incomes.[46] For example, Barbados, one of the richer economies in the Caribbean, does not suffer much from corruption. Other countries, such as Trinidad and Tobago, although not as corrupt as some countries in Latin America, still have levels of corruption that exceed those of OECD countries. The outlier in the Caribbean is Haiti, which tends to be ranked as extremely corrupt. Perhaps not surprisingly, Haiti is also the poorest country in the Caribbean. Although such correlations do not necessarily imply causation (richer countries have the resources to stamp out corruption, for instance), it is most likely that Caribbean countries could gain much from reducing corruption at all levels of society.

Property rights

Some scholars have argued that, contrary to popular belief, there is enormous wealth in developing countries. One recent study estimated that the wealth of the poor in Egypt is worth 55 times as much as the sum of all direct foreign investment ever recorded there, including the money spent on constructing the Suez Canal and the Aswan Dam.[47] The

[44] See Grossman (1989) for example.

[45] Wei (1997).

[46] Transparency International Corruption Perceptions Index (2002).

[47] De Soto (2001).

problem is that much of the poor's wealth is informal in nature. The poor have possessions, but not property. Property is a claim on ownership. As a result, it is intangible. If someone sells a house, it is not obvious to outside observers that there has been a change in ownership. Possessions are palpable, property is not. Since property is a claim on ownership, it can be subdivided into arbitrarily small pieces. A company's value may derive from its claim on indivisible physical assets, but by issuing shares in the equity of the company, ownership of those assets can be scattered across thousands of investors.

Although property rights are better established and better enforced in the Caribbean than in many developing countries, the presence of large informal economies in the Caribbean is testament to the fact that there is significant room for improvement.[48] Bringing economic activity into the formal sector has benefits well beyond the positive impact on tax collections. By formalizing property rights, the poor can use their property as collateral to secure loans for entrepreneurial activity. This will help spur growth. Furthermore, since property rights can be bought and sold and assigned to many different investors, the poor can diversify their asset holdings so as to hedge away some consumption risks.

V. The Sunrise Industries

Overview

It has often been said that Caribbean countries need to diversify their economies. The natural response to this question is, "good idea, but into what?" This section outlines a variety of "sunrise" industries that Caribbean countries have sought to enter or should consider entering. A number of nontraditional sectors have been identified by the Caribbean banana and sugar producers as potential sources for diversification. These include agro-industry, information technology, electronics, and international financial services.

Among nontraditional primary-related-activities with potential for growth are agricultural products other than banana and sugar as well as fisheries. These activities have grown rapidly in recent years and have strong linkages with tourism. The actual contribution to GDP from fisheries and nontraditional crops may be higher than shown by the national accounts, as a large proportion of activity by small-scale farmers and fishermen does not get recorded in official statistics. The information technology (IT) or "informatics" sector is currently small, but has the potential to become an efficient provider of services to North American customers given its close proximity to the United States and a relatively well-educated workforce. Although manufacturing performed unevenly in the 1990s, the electronics subsector has shown growth potential and the ability to compete internationally. The companies of this sector mainly assemble electronic parts for their U.S. and U.K. parent companies and have witnessed a surge in export demand in recent years. With the decline in banana and sugar production and expansion of tourism during the 1990s, Caribbean countries' economies have become more services-based. Services such as banking, financial

[48] The World Bank (1996), for instance, estimates that Jamaica's informal economy is about 30 percent of GDP.

services, and retailing have grown more rapidly than national output. Caribbean countries have also enacted legislation establishing offshore financial services sectors.

Trends in productivity for different sectors of an economy can indicate areas for diversification. While the lack of data precludes a detailed analysis of productivity trends in the Caribbean countries' economies, using the example of St. Lucia and the most basic measure of productivity (i.e., output per worker) some interesting points emerge. While output per worker in the agricultural sector fell by 40 percent between 1995 and 2000, tourism showed the greatest increase over this period. The service sector showed marginal improvement in productivity, while manufacturing, after falling in the mid-1990s, had recovered by 1999. There is a strong perception that this recovery may have been due to improved output and productivity in the electronics subsector.

Sector spotlight

The rest of the section reviews in greater detail the sectors that show the most promise for future development.

Fisheries

The expansion of this sector is linked to the performance of the tourist sector and has been facilitated by several factors: (i) increased utilization of modern vessels with greater engine capacity has allowed for deep sea fishing over longer periods; (ii) the opening of the fisheries complexes has augmented the handling capacity of the industry; and (iii) the sector has received small-scale loans for upgrading equipment.

Agricultural products

The cultivation of crops other than banana and sugar has grown in significance during recent years. They include citrus, cocoa, coconut, coffee, copra, cut flowers, ginger, pepper, plantains, and root crops as well as vegetables. A large part of these crops is exported to markets in the Caribbean, mostly in unprocessed form, or sold to domestic tourist establishments and cruise ships. However, some of these products are processed (e.g., pepper in Dominica and copra in St. Lucia). These other crops are cultivated by farmers who lack production and marketing infrastructure and, generally, are far removed from the governments' regular assistance programs for agriculture.

Electronics

The electronics subsector in the Caribbean has mostly operated as an enclave industry and most activities are geared toward the North American and European markets. Companies in this sector manufacture electrical products ranging from resistors, coils, and temperature sensors to filters for cable television and electronic sensors for computers. Most of the firms operate in the industrial free zones.

Information technology

Increasing emphasis has been placed on the IT industry as a potential source of growth in the Caribbean. In this context, the main focus is on "information processing," including services such as data entry operations, claims and bills (e.g., airline and telephone bills); call centers and help lines providing services such as marketing, technical support, and telebanking; and software research and development. There are also more specialized areas such as computer-aided design services, documentation and storage of data, as well as geographic information services using computer-based software.

There has been rapid growth in information processing in North America. By 1999, the value of services in the United States had increased to over US$500 billion. Decentralized operations and outsourcing have become standard practices for U.S. and European companies wishing to reduce overheads. Coupled with a shortage of qualified IT workers in industrial countries, a growing number of companies has sought to invest in developing countries. One of the fastest growing segments of the information processing industry has been the call centers, which involve a low value added component with limited or no data conversion.

Informatics in the Caribbean

The main advantages of the Caribbean for outsourced operations of international companies include a high level of literacy, geographic proximity, use of the English language, similar time zones to the United States, and stable political and social institutions. Consequently, many U.S. firms have targeted the region as a potential destination for investment. Jamaica and Barbados have had success in attracting informatics firms. Jamaica has the largest informatics sector in the region, with a dedicated informatics park.[49] Barbados has also managed to attract a large number of information processing companies related to health insurance claims processing and software development.

Table 3 shows developments in the information technology industry in selected Caribbean countries. While most of the firms were engaged in data entry up to the mid-1980s, there has been increased investment in more value-added services, such as teleservices, language translation, and software development. Efforts are being made by the Jamaican Government to improve the availability of skilled manpower and facilities. While Barbados has managed to offer attractive facilities for information processing, higher wage costs in comparison to other Caribbean countries may be a contributory factor leading to the decline in the number of firms in this sector. In OECS countries, the level of investment has been at the low value-added end of the industry, primarily in data processing. This can be attributed to skill shortages for higher value-added services such as software design and development. Low-end information processing can still provide substantial benefits in terms of employment and foreign exchange revenue.

[49] This involves the Jamaica Digiport International teleport, which allows tenants to benefit from high quality and competitively priced telecommunications.

Table 3. Informatics Industry in the Caribbean

	Number of Firms		Number of Employees	
	1995	2000	1995	2000
Jamaica	50	95	3,500	4,500
Barbados	14	10	2,300	1,806
Trinidad and Tobago	3	...	230	...
Grenada	1	...	270	...
St. Kitts and Nevis	3	...	128	...
St. Lucia	4	4	50	400-500
St. Vincent and the Grenadines	1	...	n.a.	...

Sources: World Bank; and IMF staff estimates.

The issue of competitiveness lies at the heart of investment decisions of companies seeking to outsource various information services. The key factors affecting competitiveness are: (i) telecommunications costs and infrastructure; (ii) costs and availability of skilled labor; and (iii) supporting infrastructure such as affordable industrial space, utilities, strong institutions, and intellectual property rights legislation.

Telecommunications costs and infrastructure

A key input in the IT industry is the quality and cost of telecommunications services. Caribbean countries are served by Cable and Wireless (C&W), the sole operator in the region. While C&W has frequently modernized the telecommunications infrastructure and provided reliable services to the region, it has come at a high cost. The company has licensing arrangements with individual governments and has operated as a virtual self-regulated monopoly. This, in turn, has reflected in very high international tariff rates and priced many Caribbean countries out of the information processing industry.

The recent establishment of the Eastern Caribbean Telecommunications Authority (ECTEL), by the OECS, was designed to open the telecommunications market to competition. ECTEL will be responsible for reviewing licenses and harmonizing the regulatory regime in the contracting states (namely Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines). Once the organization becomes fully operational, it will be in a position to issue licenses to new entrants and induce competition in the industry.

C&W owns an extensive range of telecommunications infrastructure and plans to "bundle out" some of the infrastructure in a competitive environment. This may take the form of outright leasing of certain portions of the network or sharing of the network and infrastructure with new firms.

The standard telecommunications infrastructure used for information processing comes in the form of "leased circuits." These are telephone lines leased out by telecommunications companies for the purposes of data and voice transfer. There are three common types of leased circuits used by information technology companies. The choice of a particular circuit would depend on the volume of data flow as well as nature of the operation.

The costs of circuits in the Caribbean is somewhat similar, perhaps reflective of the same charges provided by C&W throughout the region (Table 4). The OECS countries have the same tariff rates for the "T-1" circuits. Trinidad and Tobago has the highest rate, almost US$26,000 per month, while the rates in Barbados were also high for T-1 circuits. India in comparison has higher tariff rates than the OECS region. For the 256 kbps and 64/56 kbps circuits, both Barbados and Trinidad and Tobago are more costly than the OECS. However, the most striking comparison is with India and Mexico, which have lower rates for these two services and they would seem to provide strong competition to the region.

Table 4. Cost of Leased Circuit Telecommunications Services to the United States

(In U.S. dollars a month on one-year contracts, 2000)

	T-1 circuits*	256 kbps*	64/56 kbps*
St. Lucia	18,100	2,790	1,995
Barbados	20,000	5,000	2,080
Dominica	18,100	2,790	1,995
Grenada	18,100	2,790	1,995
Jamaica	18,100	2,790	1,850
St. Kitts and Nevis	18,100	2,790	1,995
St. Vincent and the Grenadines	18,100	2,790	1,995
Trinidad and Tobago	25,743	3,955	3,800
India	19,200	2,000	1,625
Mexico	12,500	3,154	1,077

Sources: Cable & Wireless; Mumbai Telephone Net; Jampro; and Lynx Technologies Inc.

* The "T-1" circuit is the largest of the circuits and is used for bulk data transfer. Kbps stands for kilo bytes per second. The higher numbers allow for more data to be transferred at a faster rate.

Labor costs and supply in the IT sector

The cost and the availability of skilled labor are crucial for the development of the IT sector. Table 5 gives some information on the relative competitive position of the Caribbean with regard to labor costs. The high wage costs in the United States have been a strong reason for the outsourcing of informatics services, but countries such as China, India, and the Philippines have much lower rates and these countries would be potential sources of competition to the Caribbean informatics industry.

Legislation in IT industry

The innovative nature of the IT industry requires a strong institutional framework. While the Caribbean countries have a democratic tradition with sound political institutions and legal framework, a strong property rights legislation, in particular, is critical for software development. Indeed, one of the reasons for a lack of investment in this area could be due to a lack of parity with property rights laws in other leading software development regions.

Table 5. Comparative Hourly Wage Rates in Information Processing

(In U.S. dollars, 2000)

	Data Entry	Voice Operator
St. Lucia	1.00-1.50	1.80
Barbados	2.00-2.90	...
Dominica	1.10-1.60	1.10
Grenada	1.25-2.10	3.05
Jamaica	1.10-3.00	...
St. Kitts and Nevis	1.40	...
St. Vincent and the Grenadines	1.10-1.60	1.70
Trinidad and Tobago	1.50	...
China	0.80-1.50	...
India	0.80-1.50	...
Ireland	5.50-11.50	...
Mexico	1.25-2.00	1.10
United States	7.00-9.00	8.00-12.00

Sources: World Bank; and IMF staff estimates.

Prospects for medium-term growth in the IT sector

The IT sector has potential for growth in the medium term, with significant opportunities for export earnings and employment. An important aspect of using this potential relates to marketing. Given the size of the market, it is important to target a particular section of the outsourcing market. Jamaica again provides a good example, where the short-term emphasis has been placed on attracting international corporations with some links to Jamaica. Priority sectors that have been identified include call centers for finance and tourism, technology and medical services, and language translations. The Caribbean countries large tourist sectors may facilitate development in areas such as airline reservations, telebanking, and transportation.

Tourism

In the last 20 years, tourism has emerged as the dominant sector in many Caribbean economies. As stressed in Section II, there is often a trade-off between diversification and the desire for countries to specialize in those areas that offer significant comparative advantages. The reality is that for many smaller Caribbean economies, the tourism sector is, and will continue to be, the most important source of employment and growth. Given this fact, the key issue is how to diversify the tourism sector so that a country's reliance on this sector does not lead to excessive consumption and income volatility.

There are two broad strategies that can be employed to diversify the tourism sector. The first involves the sort of "vertical diversification" discussed in Section II. Instead of just offering tourists a beach and a hotel, Caribbean destinations like Barbados and Grenada are increasingly offering such activities as sports tourism, eco-trekking, yachting, fishing expeditions, and wedding facilities. In addition, linkages have been developed that allow hotels and resorts to purchase food directly from the country's farmers, instead of having to import it.

The second strategy involves "market diversification." Market diversification entails expanding the number of markets in which a country's products or services are offered. In the case of tourism, this involves policies that seek to attract tourists from Europe, the United States, Asia, and other parts of the Americas. Some countries like Trinidad and Tobago have even had success in attracting tourists from other parts of the Caribbean, in part due to the popular Carnival festival that is held every year in Port of Spain. Additionally, countries like Barbados have actively sought to diversify the type of tourist that they attract. Thus, Barbados offers packages across the entire vacation spectrum ranging from the price-conscious student to the affluent retiree.

VI. Conclusion

Caribbean economies tend to be quite undiversified, relying primarily on only a few key industries. Despite this lack of production diversification, output growth rates in most Caribbean economies are quite stable and in many cases, more stable than in larger developing countries. There is evidence, however, that consumption volatility is higher in the Caribbean than in other regions of the world. This suggests that Caribbean countries need to strengthen arrangements to facilitate consumption smoothing.

This paper has argued that diversification can be viewed in two ways. One can view diversification as a process in which the size of the "economic pie" is held constant but resources are spread out over a larger number of sectors, so that trouble in one sector does not have an overwhelmingly large impact on the economy as a whole. However, given the small size of most Caribbean economies and the intrinsic economic benefits of specialization, this strategy is likely to yield only modest benefits. The second way to view diversification is to think of ways of expanding the economic pie by increasing productivity and by employing idle resources. Given the chronic unemployment problems that plague so many Caribbean countries, this latter view of diversification is likely to yield significant benefits.

A number of nontraditional sectors are showing signs of expansion and may contribute to further diversify the Caribbean countries' economies. The fisheries sector, nontraditional agricultural crops, and the electronics sector have grown in terms of exports and output, but they have potential for more growth. The IT sector could be a significant source for future export earnings and employment. Factors that are important for the development of the informatics sector in the Caribbean include an efficient telecommunications network that can offer competitive rates, competitive labor costs, and availability of skilled IT labor. In terms of labor costs, the Caribbean region ranks well, though there could be potential competition from other places (Mexico and some Asian countries).

Infrastructure in the newly established informatics parks requires competitive rental rates and the ability to offer quick startup facilities for international companies. These issues come within a wider framework of removing the obstacles to foreign investment and improving the approval process for such projects. Adequate intellectual property rights protection is also an important issue and must be in line with international best practice. Given the fast moving nature of outsourcing companies, the Caribbean countries' ability to attract and sustain investment in this sector would depend on how quickly they adjust to the global environment induced by innovation and competition. Apart from these global competitive issues, marketing the benefits of investing in the Caribbean may need to be strengthened to carve out a particular segment of the market.

For the Caribbean region, the future is potentially promising. Theory suggests that the relationship between globalization and the relative economic performance of nations is likely to be non-monotonic, first entailing a period of divergence followed by a period of convergence.[50] Initially, globalization is likely to lead to economic divergence as the forces of agglomeration shift industry toward core markets while deindustrializing "periphery" markets. Eventually, however, when transport and communications costs fall sufficiently far, the forces of agglomeration tend to weaken. At this stage, firms in core market find it profitable to relocate to periphery markets where land prices and labor costs are low. To some extent, this shift has already begun. Increasingly, manufacturing firms are finding it profitable to outsource labor-intensive activities to Caribbean countries. Similarly, indigenous Caribbean firms are discovering that lower trade costs and communications costs are generating profitable export opportunities in the Americas, Europe, and Asia. Yet, to fully harness the benefits of globalization, the Caribbean countries should strive to create an environment that is attractive to trade, investment, and skill accumulation. At the same time, Caribbean economies need to wean themselves off their dependence on preferential access to European markets for bananas and sugar and maintain prudent monetary policies and fiscal policies. If they can do this, the future is likely to be bright.

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[50] See Krugman and Venables (1995) for instance.

I. THE DECREASE IN OUTPUT VOLATILITY FROM THE ADDITION OF AN EXTRA INDUSTRY

Suppose a country has N industries that produce output $\{y_1, y_2, ..., y_N\}$ and are subject independent and identical output shocks with variance, σ^2. Define Y as the economy's aggregate output (i.e. $Y = y_1 + y_2 + \cdots + y_N$). Let us measure how well diversified the economy is by the variance of average industry output, $\frac{Y}{N}$. Since the variance of a sum of N independent variables is the sum of the variances, the variance of average industry output, V, is therefore $V = \frac{\sigma^2}{N}$. Taking logs of both sides and differentiating yields: $\frac{dV}{V} = -\frac{1}{N}$. Thus, the percentage decrease in volatility stemming from the addition of an extra industry falls dramatically as the number of industries increases.

II. THE WELFARE GAINS FROM REDUCING CONSUMPTION VARIABILITY

Let us compute the welfare gains from reducing consumption by postulating that households receive an uncertain consumption stream $\{c\}$, which has an expected value equal to C. We then ask what amount of money, m, households would prepared to pay so that that utility from receiving C-m with certainty is equal to the expected utility from the uncertain consumption stream c. That is, we would like to determine the value of m for which $U(C-m) = E[U(c)]$. A second degree Taylor series expansion of $U(c)$ around C yields:

$$U(c) \approx U(C) - U'(C)(c-C) + \frac{1}{2}U''(C)(c-C)^2 . \qquad (1)$$

Taking expectations of both sides of this equation and using the fact that $C = E[c]$ yields

$$E[U(c)] \approx U(C-m) = U(C) + \frac{1}{2}U''(C)\sigma_c^2 . \qquad (2)$$

Since $U(C-m) - U(C)$ is approximately equal to $-mU'(C)$, we have the result that $-mU'(C) \approx \frac{U''(C)\sigma_c^2}{2}$. Define R as the relative coefficient of risk aversion, $-\frac{CU''(C)}{U'(C)}$. Re-arranging terms, we see that,

$$\frac{m}{C} = \frac{R}{2}\left[\frac{\sigma_c}{C}\right]^2 . \qquad (3)$$

Equation (3) tells us how what fraction of expected consumption households would be willing to forego to completely eliminate consumption variability. As an example, suppose your outlook is such that there is a 50 percent chance you will have consumption of $25,000 next year and a 50 percent chance that your consumption will be $75,000. How much would you be willing to pay eliminate this uncertainty? In this case, C equals $50,000 and $\sigma_c = \sqrt{0.5(25{,}000-50{,}000)^2 + 0.5(75{,}000-50{,}000)} = 25{,}000$. If $R = 2$, you would be prepared to pay 25 percent of your expected consumption, or $12,500 to eliminate this uncertainty. In other words, you should be indifferent between the aforementioned gamble or being able to consume $37,000 with complete certainty.

Notice a key feature of equation (3): the welfare cost from consumption variability increases *at an accelerating rate* as $\frac{\sigma_c}{C}$, the coefficient of variation of consumption, rises. If household X's coefficient of variation is twice as large as household Y's, then the welfare cost of consumption variability for household X will be four times as large as for household Y. If household X's coefficient of variation is four times as large as household Y's, then welfare cost of consumption variability for household X will be 16 times as large as for household Y. This suggests that the cost of consumption variability may be quite low even for "somewhat unstable" economies but extremely high "very unstable" economies.

In practice, estimating equation (3) is confounded by at least four major problems. First, although our ultimate interest is in estimating the gains from reducing the variability of household consumption, we only have data on aggregate consumption. Data on aggregate consumption is likely to be more "smooth" than data on household consumption since idiosyncratic shocks to household consumption will be averaged away. As an example, consider an economy that consists of two households, household A and household B. Suppose that 50 percent of the time, household A earns $500 a week while household B earns $1,500 a week. The other 50 percent of the time, when household A earns $1,500 a week, household B earns only $500. Aggregate consumption in this economy will always be $2,000 a week. If we calculated σ_c using aggregate consumption data, it would be equal to zero. However, if household A and B can not pool consumption (so that A lends to B when A is relatively rich and A borrows from B when B is relatively rich), then the true value of σ_c is equal to $\sqrt{0.5(1500-1000)^2 + 0.5(500-1000)^2} = 500$. Thus, equation (3) can only be used to estimate the welfare gain from eliminating aggregate consumption variability. The actual welfare gain from eliminating household consumption variability may be much larger than the gain from just eliminating household consumption variability.

The second major problem stems from measurement error. Although data on aggregate consumption for all Caribbean economies is available from the national accounts, the data are not entirely reliable. Thus, it is likely that some of the observed variability in aggregate consumption is due to measurement error. This problem will lead us to *overstate* actual consumption variability.

Third, the economics literature has failed to deliver a consistent measure of the *R*, the coefficient of relative risk aversion. Empirical estimates of *R* vary substantially. Most estimates fall in the range of 1 to 6.[51] Given the unitary elasticity between m and R, this implies an equally wide margin of error for the estimated value of $\frac{m}{C}$.

Fourth, and most importantly, the calculation of σ_c is very sensitive to what assumptions we make about the underlying stochastic path of consumption. In a seminal paper, Lucas estimated the welfare gain from completely eliminating aggregate consumption volatility in the United States.[52] Crucial to his results was the assumption that that per capita consumption follows a trend-stationary path. Lucas found that the welfare gain from eliminate aggregate consumption in the United States is less than one tenth of a percentage point of expected consumption. In contrast, many subsequent papers have assumed that consumption is nonstationary, reflecting Hall's (1978) theoretical result that household optimization should lead to consumption paths that follow random walks.[53] The assumption of nonstationary

[51] Hanna, Gutter, Fan (1999).

[52] Lucas (1987).

[53] Hall (1978).

invariably leads to much larger estimates of consumption variability since the standard deviation of consumption increases as time passes.

To see this, consider the following thought experiment involving a nonstationary consumption path. Initially, you are given $100 of consumption. Every week, a coin is flipped. If the coin turns up heads, you receive an extra $5 dollars of consumption but if the coin turn up tails, you lose $5 of consumption The following week, a new coin is flipped and $5 is added to *whatever amount of consumption you had the previous week.* Thus, in the first week you will end up with $95 with 50 percent probability or $105 with 50 percent probability. In the second week, however, you will end up with $90 with 25 percent probability, $100 with 50 percent probability, or $110 with 25 probability. The standard deviation of consumption is $5 in the first week but rises to over $7 the following week, and so on.

In some sense, the debate about whether aggregate consumption data contains a unit root (most research suggests that it does not) misses the point. It really does not matter what one thinks of the statistical properties of consumption time series data *per se.* What matters is that one be precise in asking the correct question. It is this paper's contention that the appropriate question is: *In hindsight, what fraction of aggregate consumption were Caribbean countries willing to forgo every year in order to have the same average consumption growth rate as they actually had but with no variance in the growth rate?* In other words, if Trinidad and Tobago had a average consumption growth rate of 1.22 percent between 1960 and 1997 with a standard deviation of 10.4 percent, what fraction of annual consumption were the people of Trinidad and Tobago be willing to forsake every year to have an average growth rate of 1.22 percent but with zero variance?

By focusing on consumption paths in which deviations from the trend do not affect the trend, we necessarily assume that consumption paths are trend-stationary. From this standpoint, it is not surprising that Auffret and Mora-Báez (2001) find enormous welfare losses from consumption variability in the Caribbean. By moving away from a framework in which consumption is stationary, they end up asking an important, but a somewhat irrelevant question, namely: *What fraction of aggregate consumption were Caribbean countries willing to forgo in order to avoid the possibility of experiencing a prolonged period of unfavorable shocks that would have left consumption levels below those of say, sub-Saharan Africa?* Not surprisingly, Auffret and Mora-Báez determine that the answer is "a lot."

REFERENCES

Ades, A., Glaeser, E., 1999, "Evidence on Growth, Increasing Returns and the Extent of the Market," *Quarterly Journal Of Economics, Vol.* 144(3), pp. 1025–45.

Arrow, D., 1962, "The Economic Implications of Learning by Doing, *Review of Economic Studies,"* Vol. 29, pp. 153–73.

Auffret, P., and J. Mora-Báez, 2000, "Absence of Optimal Risk Sharing: Large Costs for Developing Economies, Huge Costs for Caribbean Countries and Small States," *World Bank.*

Balassa, B., 1978, "Export and Economic Growth: Further Evidence," *Journal of Development Economics*, Vol. 5 (2), pp. 181–89.

———, 1981, "A Stages Approach to Comparative Advantage," *The Newly Industrializing Countries in the World Economy*, Ed. By Bela Balassa (New York: Pergamon Press).

———, 1982, *Development Strategies in Sem-Industrialized Economies* (Baltimore: Johns Hopkins University Press).

Barghouti, S., L. Garbus, D. Umali, (Eds., 1992 "Trends in Agricultural Diversification—Regional Perspectives," World Bank Technical Paper No. 180 (Washington: World Bank).

Carrington, W., and E. Detragiache, 1998 "How Big is the Brain Drain?" IMF Working Paper 98/102 (Washington: International Monetary Fund).

Cashin, P., and J. Mcdermott, 2001 "The Long-Run Behavior of Commodity Prices—Small Trends and Big Variability," IMF Working Paper 01/68 (Washington: International Monetary Fund).

CGCED (2000): The Importance of Financial and Insurance Market Integration in the Context of High Consumption Volatility in CGCED Countries, *Caribbean Country Management Unit at the World Bank.*

———, Managing Catastrophic Risks Using Alternative Risk Financing & Insurance Pooling Mechanisms, *Caribbean Country Management Unit at the World Bank.*

———, Tourism and the Environment in the Caribbean: An Economic Framework, *Caribbean Country Management Unit at the World Bank.*

———, Caribbean Economic Overview, *Caribbean Country Management Unit at the World Bank.*

Commonwealth Secretariat/World Bank Joint Task Force on Small States, 2000, "Small States: Meeting Challenges in the Global Economy".

Commonwealth Secretariat/World Bank Joint Task Force on Small States, 2000, "Small States: A Composite Vulnerability Index".

Coppin, A., Olsen, R., 1998, "Earnings and Ethnicity in Trinidad and Tobago". *The Journal of Development Studies*, 34 (3), 116–34.

Corbo, V., 1985, "*Export Oriented Development Strategies,"* (Boulder: Westview Press).

De Cordoba, G., Kehoe, T., 2000 "Capital Flows and Real Exchange Rate Fluctuations Following Spain's Entry into the European Community," *Journal Of International Economics*, 51, pp. 49–78.

Derosa, D., 1991, "Increasing Export Diversification in Commodity-Exporting Countries: A Theoretical Analysis," *IMF Working Paper* No. 105, (Washington: International Monetary Fund).

———,1992, "Commodity Dependence and Export Diversification: Some Empirical Evidence Bearing on Proposal to Diversify LDC Exports," *Eastern Africa Economic Review,* Vol. 8, pp. 54–74, Nairobi.

De Soto, H., 2000, "*The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else,*" New York: Basic Books.

Dollar, D., 1992, "Outward-Oriented Developing Economies Really Do Growth More Rapidly: Evidence From 95 Ldcs 1976-1985," *Economic Development and Cultural Change* No. 40 5223–544;

Easterly, W., Levin, R., 2000, "It's Not Factor Accumulation: Stylized Facts and Growth Models, *World Bank,*" Development Research Group (Forthcoming Working Paper).

Easterly, W., 2001, *"The Elusive Quest for Growth,"* (Cambridge: MIT Press).

Edwards, S., 1998, "Openness, Productivity and Growth: What Do We Really Know," *Economic Journal 108*, pp. 383–98.

Feldstein, M., Horioka, C., 1980, "Domestic Savings and International Capital Flows," *Economic Journal*, 90 (6), pp. 314–29.

Ferrantino, M., De Piñeres, S., 1997, "Export Diversification and Structural Dynamics in the Growth Process: The Case of Chile," *Journal of Development Economics,* Vol. 52, pp. 376–91, North-Holland.

Freeman, R., Lindauer, D., 1999, "Why Not Africa?" *NBER Working Paper No. 6942.*

Gil, H., 1997, "CARICOM and Hemispheric Trade Liberalization, in Integrating the Hemisphere: Perspectives from Latin America and the Caribbean," (Washington, DC: Inter American Dialogue).

Grossman, H., 1998, "Producers and Predators," *Pacific Economic Review*. 3(3), pp. 169–187.

Grosmann, L., 1994, "British Äid and Windward Bananas: The Case of St. Vincent and The Grenadines," *Social and Economic Studies*, 43.

Guasch, J., 2001, "Inventory Levels in LAC: A Red Flag For Competitiveness and Productivity," *World Bank Occasional Note.*

Hall, R., 1978, "Stochastic Implications of the Life Cycle-Permanent Income Hypothesis," *Journal Of Political Economy*, 86, pp. 971–87.

Hall, R., C. Jones, 1999, "Why Do Some Countries Produce So Much More Output Per Worker Than Others?" *Quarterly Journal Of Economics*, 114(1), pp. 83–116.

Hanna, S., M. Gutter, J. Fan, 1999, "A Theory Based Measure of Risk Tolerance," *Ohio State University Working Paper.*

Harrington Jr., J., 1997, "Impact of Tariff Preferences on Caribbean Exports," Paper Prepared for the IDB Integration and Regional Programs Department.

Hirschman, A., 1945, "National Power and the Structure of Foreign Trade," (Berkeley: *University of California Press).*

Hulten, C., 1996, "Infrastructure Capital and Economic Growth: How Well You Use It May Be More Important Than How Much You Have," *NBER Working Paper No. 5847.*

Itam, S., S. Cueva, E. Lundback, J. Stotsky, and S. Tokarick, 2000, "Developments And Challenges in the Caribbean Region," *IMF Occasional Paper No. 201.*

Jessen A., E. Rodriguez, 1999, "*The Caribbean Community: Facing the Challenges of Regional and Global Integration*," Washington, D.C: Inter-American Development Bank.

Juan-Ramón, H., R. Randall, and O. Williams, 2001, "A Statistical Analysis of Banking Performance in the Eastern Caribbean Currency Union in the 1990s," *IMF Working Paper (Forthcoming).*

Krueger, A., 1978, "Foreign Trade Regime and Economic Development: Liberalization Attempts and Consequences," *NBER.*

Kruger, A., 1985, "Import Substitution Versus Export Promotion," *Finance and Development*, 22 (2).

———, 1999, "The Developing Countries and the Next Round of Multilateral Trade Negotiations," Working Paper No.2118. Washington,DC: World Bank.

Krugman, P., 1991, "*Geography and Trade*," (Cambridge: MIT Press).

Krugman, P., A. Venables, 1995, "Globalization and the Inequality of Nations," *Quarterly Journal of Economics*, 110 (4), pp. 857–80.

Lipsey, R., 2001, "Foreign Direct Investors in Three Financial Crises," *NBER Working Paper No. 8084*.

Lipsey, R., F. Sjoholm, 2001, "Foreign Direct Investment and Wages in Indonesian Manufacturing," *NBER Working Paper No. 8299*.

Lizano, E. 2000, "Liberalizing Trade in Services: A Developing-Country Perspective, In *Services Trade in the Western Hemisphere," (*Washington-DC: Brookings Institution Press).

Lucas, R., 1987, "*Models of Business Cycles*," Yrjo Jahnsson Lectures. (New York: Blackwell).

———, R., 1990, "Why Doesn't Capital Flow from Rich Nations to Poor Nations?" *American Economic Review*, 80(5), pp. 92–96.

Maizels, A., 1992, "*Commodities In Crisis—The Commodity Crisis of the 1980s and the Political Economy of International Commodity Policies*," Clarendon Press, Oxford.

Mccarthy, D. and G. Zanalda, 1994, "Caribbean Experience With External Shocks," Washington: World Bank.

Meins, B., 1996, "Adjustment, Reform and Growth in the Caribbean, In *Choices and Changes—Reflections on the Caribbean*," Baltimore: Johns Hopkins University Press.

Moran, T., 2000, "FDI and Exports, *Conference on Export Development in the Millennium: Challenges and Opportunities for Latin America and the Caribbean,"* Washington, DC: Inter-American Development Bank.

Morduch, J., 1995, "Income Smoothing and Consumption Smoothing," *Journal of Economic Perspectives*, 9 (3), pp. 103–114.

Nogueira, U., 1997, "The Integration Movement in the Caribbean at Crossroad: Towards A New Approach of Integration, Buenos Aires: Institute for the Integration of Latin America and the Caribbean—INTAL."

Noorbakhsh, F. and A. Paloni, 1998, "Structural Adjustment Programs and Export Supply Response, Journal of International Development," Vol. 10 , No. 4, pp. 555–573, (Sussex, Willey Publishers.)

Nurske, 1953, "*Problems Capital Formation in Underdeveloped Countries*," New York: Oxford University Press.

Obstfeld, M., K. Rogoff, "*Foundations of International Macroeconomics*," (Cambridge: MIT Press.)

OECS, 2000, "Towards an OECS Development Strategy, *ECCB*."

Paus, E.(Editor), 1988, "*Struggle Against Dependence- Nontraditional Export Growth in Central America and the Caribbean*," Westview Press, London.

Planning Institute of Jamaica, 1999, "The Importance In Trade In Services for CARICOM Economies and Prospects for Future Developments. Paper Presented at Commonwealth Caribbean Workshop on Opportunities and Challenges," St. Kitts and Nevis.

Prebisch, R., 1950, "*The Economic Development of Latin America and its Principal Problems*," New York: United Nations.

Pritchett, L., 1997, "Where Has All The Education Gone?" *Policy Research Working Paper 1581*. World Bank, Policy Research Department.

Psacharopoulos, G., 1994, "Returns to Investment in Education: A Global Update," *World Development*, 22, pp. 1325–43.

Rauch, J., V. Trindade, 1999, "Networks Versus Markets in International Trade," *Journal of International Economics*, 48 (1), pp. 7–35.

Reinhart, C. and Wickham, P., 1994, "Commodity Prices: Cyclical Weakness or Secular Decline?" *IMF Staff Papers*, 41, pp. 175–213.

Rodrik, D., 1998, "Democracies Pay Higher Wages," *Quarterly Journal of Economics*, 114(3): pp. 707–738.

———, D., 2001, "Why Is There So Much Economic Insecurity in Latin America?" *CEPAL Review (Forthcoming)*.

Romer, P., 1986, "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, 98 (10), pp. 1002–1037.

Saez, R., 1998, Las Exportaciones Latinoamericanas Y Los Recursos Naturales En La Decada De 90, *Integracion & Comercio*, 4/5, 15–48, INTAL, Buenos Aires.

Shafaeddin, M., 1995, "The Impact of Trade Liberalization on Export and GDP in Least Developed Countries," *UNCTAD Review*, United Nations.

Shiller, R., 1999, "Social Security and Risks to Our Livelihoods in the Long Term," *Mckenna Lecture at St. Vincent's College.*

Siegel, P., Johnnson, Alwang, J., 1995, "Regional Economic Diversity and Diversification," *Growth and Change* Vol. 26, 261283, University of Kentucky.

Singer, H., 1952, "*The Mechanics of Economic Development*," The Indian Economic Review.

Taylor, L., 1985, *"Trade and Growth,* New York," National Economic Association.

Townsend, R., 1995, "Consumption Insurance: An Evaluation of Risk-Bearing Systems in Low-Income Economies," *Journal of Economic Perspectives*, 9 (3), pp. 103–114.

United Nations Conference on Trade and Development ,1989. "*Recent Developments in Existing Compensatory Financing Facilities and Various Institutional Options.*"

Vasconcellos, G. and Neto, R., 1993, "La Diversificacion de las Exportaciones y la Eficiencia de la Cartera de Exportacion-Estudio Comparativo de los Paises del Sureste de Asia y de la America Latina," *El Trimestre Economico* No. 237, Fonde De Cultura Economica, Mexico.

Wei, S., 1997, "Why Is Corruption So Much More Taxing Than Tax? Arbitrariness Kills," *NBER Working Paper No. 6255.*

Welch, B., 1994, "Banana Dependency: Albatross or Life Raft for the Windwards," *Social and Economic Studies*, 43, 123–149.

World Bank, 1996, "Caribbean Countries, Prospects for Services Exports from English-Speaking Caribbean," Report No.15301, Washington, DC.

World Bank, 1996, "Trends in Emerging Economies, Jamaica."

———, 2000, "A Caribbean Education Strategy."

Young, A., 1995, "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience," *Quarterly Journal of Economics*, 110, pp. 643–80.

Ziesemer, T., 1995, "Economic Development and Endogenous Terms-Of-Trade Determination: Review and Reinterpretation of the Prebisch-Singer Thesis," *UNCTAD Review*, United Nations.