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I. BARBADOS: GROWTH DYNAMICS¹

A. Introduction and Background

1. Lack of information about Barbados' growth potential and its determinants has hampered the analysis of inflationary pressures and debt dynamics in the country.

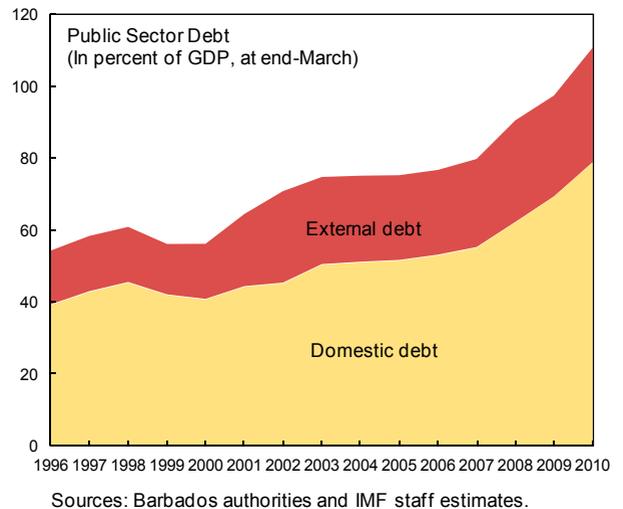
Accelerating inflation before the current recession broke out suggests that aggregate demand was running ahead of supply. However,

sticky inflation figures so far in 2010 raise the issue of the relative importance of economic slack and commodity price shocks in determining the cost of living in Barbados.

To shed light on the issue, measures of Barbados' potential to produce goods and services are needed, so that cyclical pressures on production resources can be separated from exogenous shocks. Moreover, the public debt as a ratio of GDP has

experienced a marked spike in the past five years. Looking ahead, sustainable debt accumulation will depend on trend growth

rates in the country, which creates an urgent need for forward-looking estimates of Barbados' growth potential. This note attempts to close this information gap by using a growth accounting exercise to estimate potential growth and its main drivers.



B. Estimating Potential GDP Growth

2. **Potential GDP in Barbados can be decomposed into three key determinants, using a production-function approach:**² (i) the capital stock; (ii) trend labor services; and (iii) trend total factor productivity (TFP). The notion of potential output calculated here is the maximum amount that can be produced without exerting excessive pressure on resource utilization. In order to estimate potential GDP, we first calculated TFP using the following equation, which assumes a simple Cobb-Douglas production function for the country:

$$tfp = rgdp - \alpha ks - (1 - \alpha) \ell \quad (1)$$

¹ This chapter was prepared by Gamal El-Masry and Lulu Shui.

² The methodology used in this chapter follows Estevão and Tsounta (2010).

All variables are in logarithm. The variable \underline{rgdp} is Barbados' real GDP, \underline{ks} is the capital stock and $\underline{\ell}$ is the employed population. Note that variables like the utilization of available labor (e.g. average hours of work) or available capital (e.g. number of production shifts) are not included in equation (1), as these data are not available for Barbados. The coefficient $(1-\alpha)$ refers to the share of labor income in total value added. Since Barbados does not publish the income side of the national accounts, after a robustness check using a band of 55 to 70 percent (the usual range of values for different countries), we chose 65 percent for our final calculation.

3. **Once observed TFP is obtained, potential GDP can be calculated as:**

$$y^* = \alpha ks + (1 - \alpha) (1 - u^*) + (1 - \alpha) lfp^* + (1 - \alpha) wap + tfp^* \quad (2)$$

To add important policy nuances to the analysis, labor services used in the production process is decomposed into its main components in equation (2): \underline{u} , the unemployment rate; \underline{lfp} , the labor force participation rate; and \underline{wap} , total working-age population. Variables with * are trend values obtained using the HP filter, with the usual smoothness parameter applied to annual series of $\lambda=100$. We use the actual capital and working-age population in the calculation for potential output,³ as these variables cannot deviate from notional “equilibrium” values in the short term (unlike the unemployment rate and labor force participation), i.e., they are “sunk” variables. Results are not sensitive to using smoother versions of capital and working age population growth, though. Trend TFP is used in (2) to smooth out the known residual cyclicity in measured TFP and to capture the underlying rate of technological progress and managerial innovation in the country. This residual cyclicity is exacerbated in the case of Barbados by the lack of information on labor and capital use.⁴ The result of this decomposition is shown in Figures 1 and 2. In the following sections, we discuss Barbados' cyclical developments of the last 25 years, including developments in the key determinants of potential output.

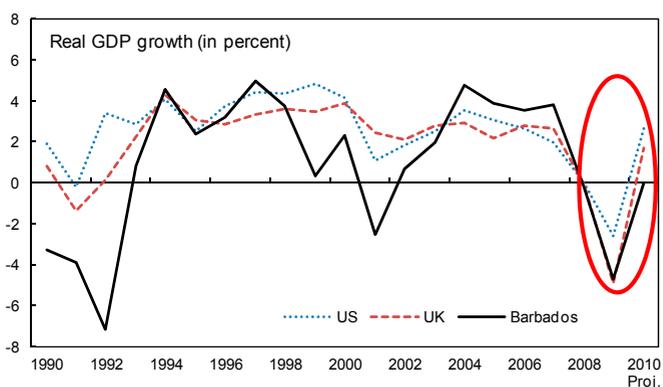
³ There is no statistical release with information on the stock of capital in Barbados. For that, we used investment data from the national accounts and calculated the capital stock according to the perpetual inventory model, assuming a depreciation rate of 5 percent per year. The calculations began with data for 1980 and assumed an initial stock of capital that was about four times the annual investment at that time.

⁴ In other country cases, information on the number of hours worked or number of work shifts would improve the measurement of actual hours of work and the intensity of capital utilization, respectively. In addition, for Barbados, there is some evidence from discussions with union representatives and employers, that in the context of the Social Partnership arrangements, firms are encouraged to hang on as long as possible to their work force, even as they reduce working hours. Likewise, it is not uncommon for companies to “take advantage” of lower tourist demand to close whole wings of hotel facilities for renovation, thus reducing the utilization of the capital stock in times of weaker demand.

C. Some Stylized Facts on Barbados' Business Cycles

4. **Over the past 25 years, Barbados experienced three distinct business cycles.** The deepest economic recession in recent memory occurred in the early 1990s, when the economy contracted by a cumulative 14 percent over three years. Following strong and concerted adjustment efforts during 1992-93, the economy rebounded vigorously, but it took four years to reach the output level that prevailed before the onset to the recession. The next recession, about 10 years later, was far less pronounced (with a drop from peak to trough of less than 3 percent), and the economy recovered much quicker. The current recession (started in late-2007) will likely lie between the two previous episodes in terms of depth and length.

5. **Barbados' economic fortunes are closely linked to those of its key tourism markets.** Past performance shows that, in general, a slowdown in U.K. and U.S economic growth is quickly transmitted to the Barbados economy and amplified many times over.⁵ This was particularly valid for the 1991-92 and 2001 episodes, when growth barely dipped below zero in the two advanced economies, but triggered economic recessions in Barbados. However, the most recent global recession is somewhat different, particularly as output contracted more sharply in the United States and in the United Kingdom, while so far the timing and depth of the slump has been more synchronized across the three economies. This may bode ill for Barbados, since the U.S. and U.K. recoveries are likely to be weaker than in previous slowdowns, and unemployment in these economies may persist at elevated levels for many years to come, suggesting that the economic rebound in Barbados may be more anemic and prolonged than in previous episodes.



Sources: Central Bank of Barbados, WEO and IMF staff estimates and projections.

D. The Evolution of Capital, Labor, and Total Factor Productivity

6. **Over the past 20 years, Barbados has seen its capital accumulate at a vigorous rate.** Our estimates suggest that the capital stock has grown at the rate of about 6.5 percent over the past ten years. During that period, capital accumulation grew above its trend during

⁵ In this respect, the general phrase that “if the United States sneezes, then the Barbados economy catches a cold” appears to hold true for the past generation.

periods of economic upswings, and less forcefully during recessions. In that respect, the current recession is no exception. The observed lower investment during the current economic downturn is explained to a large degree by the sharp decline in FDI and a constrained public sector budget. As the demand for Barbados' real estate has stagnated and inventories have built up, the profitability of new real estate projects has deteriorated. Similarly, weak demand for tourism services has forced facilities to operate below their capacity, providing a disincentive to investments in new tourism developments. Also, as the central government budget came under increasing pressure during the economic downturn, spending on capital projects was cut significantly.⁶

7. Labor usage posted significant growth in the last two decades, as unemployment rates declined and labor force participation increased, despite some deceleration in working-age population (Figure 1). While the *working-age population* grew at an annual average rate of 0.4 percent over the past 20 years, the *labor force* in Barbados grew by twice that rate (0.8 percent), as *labor force participation* increased considerably, particularly through the mid-2000s. However, from its peak of 70 percent in 2005, the labor force participation rate dropped to 66.9 percent at end-2009, reinforced by the onset of the recession, when potential workers withdrew from the labor force, discouraged by waning work opportunities and the reality of rising unemployment and longer job-search spells.⁷ The number of *employed persons* grew since 1990 by an even higher average rate of 1.1 percent per year, resulting in a significant decline in the unemployment rate, from over 24 percent at the height of the 1993 recession to less than 7½ percent in 2007. The current recession has partly reversed that trend, pushing unemployment to 10.7 percent in the first quarter of 2010.

8. While growth in the last two decades had benefitted from increased use of production factors, total factor productivity has actually declined. Over the course of the past 20 years, TFP has declined, on average, by about 1-2 percent a year. During that period, TFP saw only brief, albeit small, positive growth, which coincided with peaks in real output growth, suggesting that those observations could have been caused by increased utilization of production factors, which are not controlled for in our calculations but only smoothed out by a statistical filter.

⁶ It is also possible that Barbados' high debt is starting to adversely impact investment. In studying the impact of high public debt on long-run economic growth, Kumar and Woo (2010) estimated that a 10 percentage point increase in debt was associated with a decline in investment of 0.4 percentage points of GDP.

⁷ This drop was particularly severe among female wage earners, who saw their participation rate fall by 3.4 percentage points (from 64.5 percent in 2005 to 61.1 percent at end-2009), compared to a 1.8 percentage reduction for their male counterparts (from 75.2 percent in 2005 to 73.4 percent at end-2009).

Annual Growth of Potential Output Components				
	1988-1997	1998-2007	2008	2009
Potential Growth, % change	0.45	2.26	1.87	0.64
Capital Stock, % change	3.95	7.11	6.83	3.65
Labor Services				
NAIRU, % change	-1.83	-5.51	-3.27	-3.14
NAIRU, percentage points	17.67	10.72	8.23	7.97
TFP, % change	-2.10	-1.00	-0.67	-0.70

Source: IMF staff calculations.

Contribution to Potential Output Growth (in percent)				
	1988-1997	1998-2007	2008	2009
Potential Growth, % change	0.45	2.26	1.87	0.64
Capital Stock	1.38	2.49	2.39	1.28
Labor Services	1.16	0.78	0.15	0.07
NAIRU	0.24	0.48	0.20	0.18
Labor force participation rate	0.66	0.02	-0.23	-0.24
Working age population	0.26	0.28	0.18	0.12
TFP	-2.10	-1.00	-0.67	-0.70

Source: IMF staff calculations.

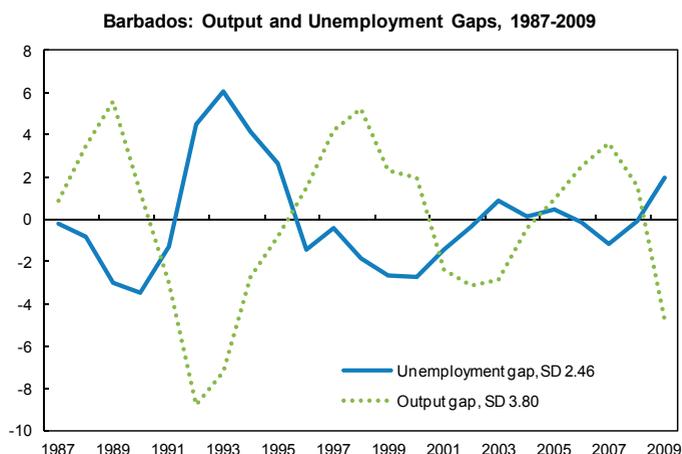
9. **Potential GDP is estimated to have grown at an annual rate of just over 2 percent over the past 10 years.** Actual GDP grew above its long-term potential during 2005-07, when there were clear signs of overheating in the economy. The GDP boom was in great part powered by large public investment projects (e.g., a cricket stadium and roads) in the run-up to the Cricket World Cup in 2007, and other off-budget projects financed through public-private partnership arrangements (PPPs), such as a new prison. The unemployment rate dropped to 7.1 percent in Q4 of 2007, its lowest level in twenty years. High inflationary pressures during 2005-7 were masked by price controls on petroleum products, which were lifted in early 2008, leading to a burst in CPI inflation in that year. Absent these controls, average inflation would have been higher during 2005-07 and lower during 2008-09.

Growth and Contraction (Average percentage change, unless otherwise indicated)		
	2005-07	2008-09
GDP	3.8	-2.5
Unemployment rate	8.6	9.1
CPI inflation 1/	5.8	5.9
Broad money	10.4	2.8
Investment (in % of GDP)	16.0	13.2
<i>Of which</i> : central government	9.7	5.6
Imports	8.9	-9.3

1/ In 2008, inflation was boosted by a step adjustment in domestic petroleum prices.

Sources: Barbados authorities and IMF staff estimates.

10. **Employment is less volatile than output.** Over the past 20 years, employment levels have not varied as much as output has, partly in line with international evidence but also possibly reflecting social policies and priorities forged through the tripartite Social Partnership arrangement. One of the main objectives of the Social Partnership consultations has been to safeguard employment as a national priority through agreement on appropriate incomes policies. Thus, over the period 1987-2009, the standard deviation of the *output gap* (defined as the difference between actual and potential output as a share of potential output) was 3.80, compared with the standard deviation for the *unemployment gap* (defined as the difference between the unemployment rate and the non-accelerating inflation rate of unemployment, NAIRU, used in the calculation of potential output) of 2.46. That said, there are some signs that, as the current recession persists into a third year, financial pressures are mounting on employers and increasing the chance of more firings in the coming.⁸



⁸ As a case in point, the Central Bank of Barbados reported in its economic review for the third quarter of 2010 that continued low demand in the construction sector has forced the only cement company on the island to lay off half of its workforce, albeit temporarily.

11. **Capital controls do not appear to have affected potential output growth in a significant way.** The Central Bank of Barbados (CBB) maintains capital controls that are aimed at protecting the country from volatile and destabilizing short-term movements. These include the requirement to register at the CBB large capital inflows, including FDIs, to facilitate the repatriation of profits and capital on liquidation or sale. While removing the capital controls on *outflows* could, in theory, increase the attractiveness of Barbados for FDI *inflows* (Ostry, 2010), in reality these controls, especially on outward flows, have been applied in a very liberal way in Barbados. There is, therefore, little evidence that they have hampered investment in viable projects. Another argument is that fewer controls on *inflows* could reduce the cost of capital for investment by allowing competition for the funding of projects, including for domestic investors (Edwards, 2002). While this may be true, it comes, however, at a high cost of exposing the country to more volatile debt financing flows and circumventing domestic monetary policies.

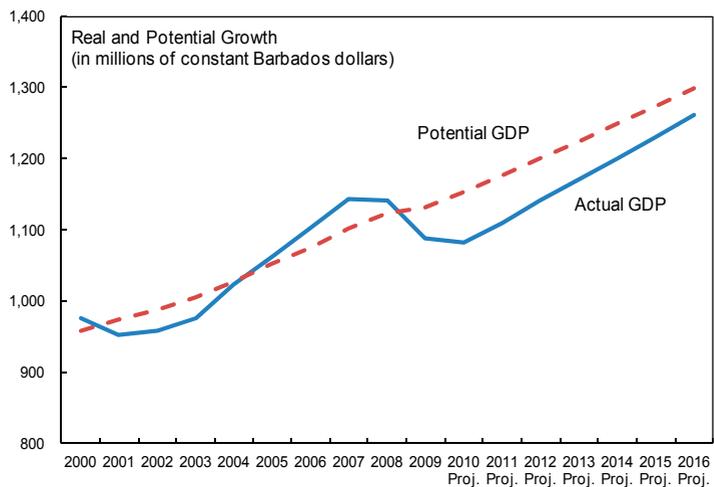
E. Conclusion and Policy Implications

12. **The short-term recovery of the Barbados economy will critically depend on the rebound of demand for its services in its traditional**

markets. Given that unemployment in the United States and the United Kingdom—Barbados’ most important tourist source markets—are likely to remain at elevated levels for the foreseeable future, it is expected that the recovery in Barbados will also be weak and protracted.

Accordingly, under staff’s baseline projections, the output

gap, which opened during 2008-10, is not expected to close completely over the medium term. We assume that the average potential growth rate for the next 5 years will be 2 percent, as investment rates will take a while to return to pre-crisis levels. We expect potential growth to go back to its long term rate of 2¼ percent after 2015.

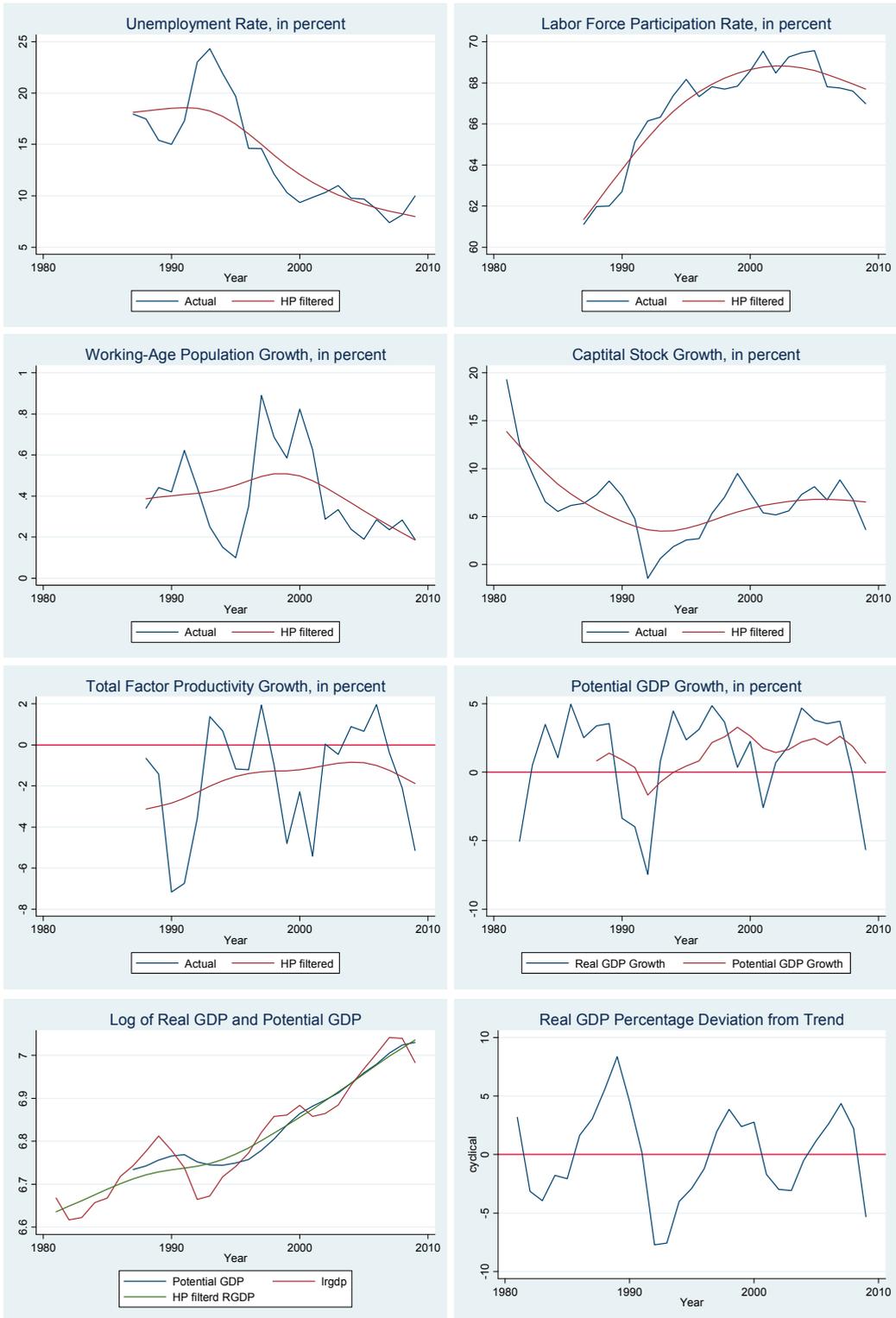


Source: IMF staff estimates and projections.

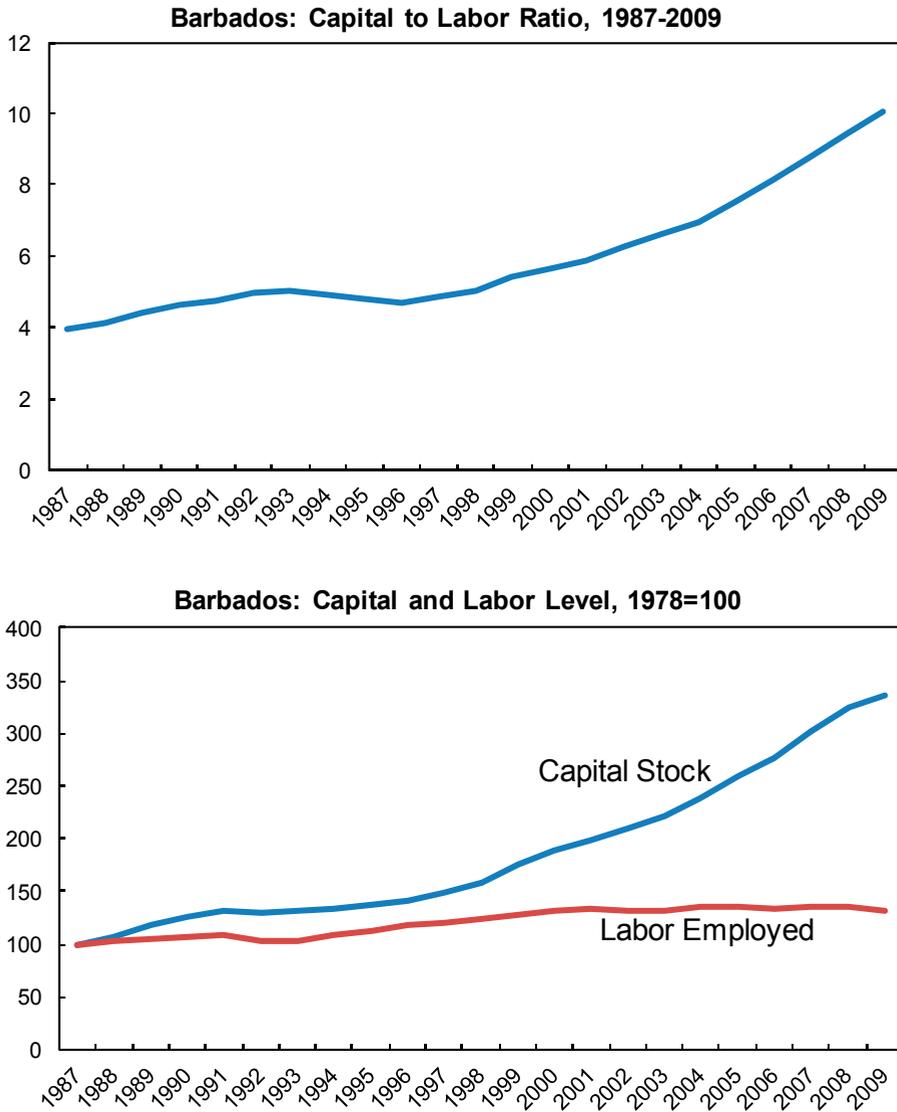
13. **However, over the medium-to-long term, potential output could be raised by policies that would diversify the economy and boost TFP growth:**

- **Barbados remains an attractive tourist destination.** While demand from its traditional markets that are facing cyclical downturns has weakened, other emerging markets—hitherto untapped—offer new growth prospects. To this end, the authorities have identified Brazil and East Asia as growth opportunities. They have already introduced a weekly flight to São Paulo and are studying creative programs to attract tourists from the Far East for combined “Caribbean” experiences with neighboring islands.
- **Efforts to boost TFP growth could include streamlining and increasing efficiency in government services.** This would reduce the bureaucratic burden of doing business in Barbados and promote investment. The authorities could also review the country’s immigration policies to ensure that foreign investors are not discouraged from employing expatriate professional staff who would help introduce new know-how and international best practices to the country. Finally, strategic investments, such as the privately funded underwater pipeline to pump natural gas from Trinidad and Tobago to Barbados, are steps in the right direction. This project has the promise of lowering the cost of electricity in Barbados, while reducing the carbon footprint of electricity generation.

Chapter I Figure 1. Barbados: Potential Output Growth



Chapter I Figure 2. Barbados: Capital and Labor Growth



Sources: Barbados authorities; and IMF staff calculations.