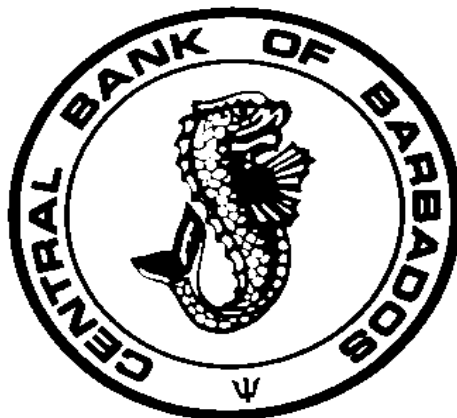


**COMPETITIVENESS IN THE CARIBBEAN AND  
CENTRAL AMERICA**

BY

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## Competitiveness in the Caribbean and Central America

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### ***Abstract***

Despite claims that Caribbean countries have lost international competitiveness in the recent past, most current measures of competitiveness rely solely on price as their defining indicator. However, the issues most critical to Caribbean competitiveness have to do with production structures, changes in the export mix, productivity changes and institutional reform and development. Therefore, this study sought to establish appropriate measures of price and non-price competitiveness in order to evaluate competitiveness in the Caribbean. Results suggest that, by and large, most countries have become more price competitive, while the smaller Caribbean islands have increased their advantage in the exports of goods and services and international finance. Preliminary estimates also provide some evidence that aggregate world demand, local investment and price competitiveness improve the growth of production in the tradable sector.

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## ***Introduction***

As everyone knows, price is not always the most appropriate measure of competitiveness. The most successful producers are those who are able to gain market share even though their prices are higher than the competition, or are rising more quickly. This holds true at the national level: the issues most critical to Caribbean competitiveness have to do with production structures, changes in the export mix, productivity changes and institutional reform and development (See Tsikata et al, 2009; Caribbean Trade and Adjustment Group, 2003), more so than prices. Competitive success is therefore best measured by indices such as market shares and revealed comparative advantage (See McIntyre, 1995; Worrell and Craigwell, 2008).

There may nonetheless be a role, albeit minor, for price competitiveness as an element in a composite index of country competitiveness, that takes account of structural, institutional and productivity factors (See World Economic Forum, 2010-2011, for example) or in estimating the impact of price and non-price factors on investment, production and growth (Marsh and Tokarick, 1994). For these purposes, what is the best available measure of price competitiveness? Thus, this study seeks to address that question using data for 12 Caribbean and Central American countries for the period 1980 – 2010.

The first section of the paper is concerned with a definition and measure of price competitiveness which is sufficiently concrete to have an analogue which policy makers can measure. The second section reviews the literature on standard REER measures of price competitiveness, and the alternatives to the REER, including indices based on the prices of tradables and nontradables. In the third section price competitiveness indicators based on the relative prices of tradables are computed for a selection of Caribbean and Latin American countries. The fourth and fifth sections combine our relative price results with other primary and secondary information, to reach a conclusion about the overall trends in Caribbean competitiveness. In the sixth section, we conclude.

### ***What is price competitiveness?***

The notion of the price competitiveness of a small open economy has meaning only in a dynamic sense: everything that the SOE sells on the international market must be at the ruling international price, over which it has no control. The country may sell all it produces at that price, and there is therefore no benefit from selling at a lower price. The activities over which the SOE has price control are by definition nontradable; otherwise they would be subject to the discipline of the world price. Therefore, we should speak of price competitiveness in a dynamic sense, in which case an increase in the domestic offer price of tradables relative to the ruling world price of tradables would portend the eventual demise of the domestic tradables sector, unless that increase were arrested. Of course, if we relaxed any assumption, for example that all tradables are identical homogeneous goods, that conclusion would no longer hold. Instead, we might find that the relative increase in the domestic price of tradables is a reflection of export success rather than a harbinger of failure, the result of a successful marketing campaign or an improvement in product quality.

In practice, a country's competition is not the rest of the world, but the subset of countries which have a similar basket of exports and traded services. The indices used in this study are computed for each tradable sector, and each country's competitiveness is measured relative to competing producers of each tradable.

The price competitiveness index *PCI* is constructed as follows:

For each country  $n$  an index is computed for each tradable  $i$  of the price of its value added  $P_{i,n}$  as a ratio to the weighted value added of tradables produced in competing countries:

$$PCI_{i,n} = P_{i,n} / \sum_j (P_{i,j} \cdot \alpha_{i,j}), \quad j = 1, 2, \dots, n-1$$

Country  $n$ 's price competitiveness index is the weighted sum of the  $PCI$ 's of all the tradables it produces:

$$PCI_n = \sum_i (PCI_{i,n} \cdot \alpha_{i,n})$$

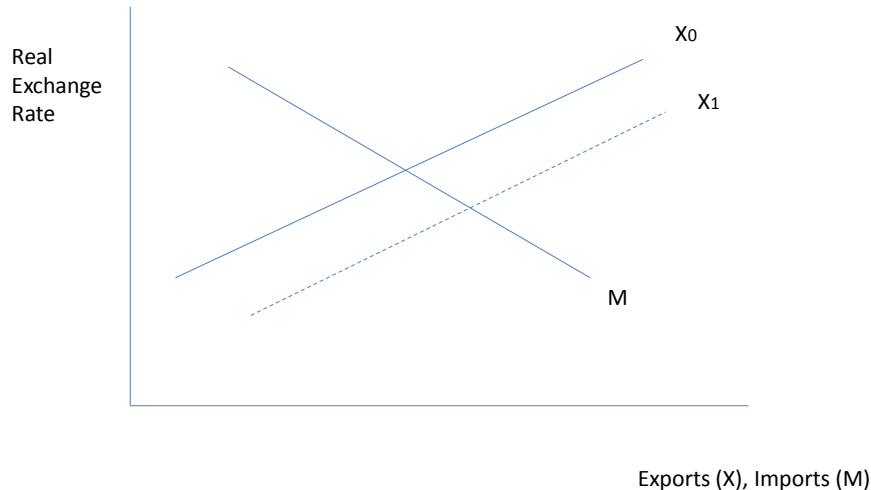
The obvious benefit of using this approach is that the greatest weight is placed on that tradable sector in which that country produces greatest and hence the price competitiveness index will primarily represent the relative price at which each country produces its primary foreign exchange-earning outputs.

### ***Precedents for non-REER approaches***

Although the most commonly used price competitiveness indices are the so-called real effective exchange rates (REERs), weighted combinations of exchange rates and consumer price indices, their deficiencies are well known and widely documented. In a paper presented to an IMF Research Conference in honour of the late Michael Mussa, Harberger (2004) succinctly covers the main errors resulting from analysis using REERs. Harberger points out that in the theoretical model, the real exchange rate is the price that equilibrates the international trade account. His preferred measure is the exchange rate deflated by the deflator of value added in the nontradables sector, which is unambiguously interpreted as the number of GDP baskets required to purchase a nominal dollar of foreign exchange. In order to calculate the number of GDP baskets needed to purchase a real dollar of foreign exchange a world price index of tradables is needed. Harberger suggested how this might be done, and recommended that the IMF undertake to publish such an index. In the absence of a global index, each country would be obliged to compute its own index of the international prices it pays for imports.

Harberger shows why the REER indices published by the IMF are not truly a measure of the prices that will equilibrate international trade. They incorporate the relative CPIs of the home country and its trading partners, but the CPI includes the prices of *nontradables*, which play no part in equilibrating international trade, by definition. Harberger also makes the point that competitiveness is to be assessed on the basis of market share, not the real exchange rate. In Figure 1, an increase in competitiveness is represented by a shift of the export supply curve from  $X_0$  to  $X_1$ , rather than by movement along the  $X_0$  line.

Figure 1: The Equilibrium of International Trade



In a widely quoted paper, Marsh and Tokarick (1994) critically review the REER and four alternative measures of price competitiveness: an RER based on export unit values, for imperfectly competitive markets where products are not homogeneous and law of one price does not rule; the price of nontradables relative to the price of tradables; an RER which combines exchange rates with unit labour costs in manufacturing at home and abroad; and an RER which is constructed as a proxy for relative profitability. The indices which reflect factor costs of production were expected to provide superior explanations of balances of trade, but this could not be empirically collaborated. Dissatisfaction with the diagnoses and prescriptions flowing from analysis based on REERs has fuelled a great deal of experimentation with these and similar relative price indices, for example by Arriazu (1998), Felix (1998), Edwards (1989), and IMF (2005). However, no one index has gained traction in the international debate on the significance of price competitiveness to international trade and global imbalances.

The literature also recognises that price competitiveness is not the sole driver of international trade. A strand of literature uses measures of competitiveness based on the country's market share (McIntyre, 1995; Worrell and Craigwell, 2008; Ganga and Ramdas, 2002), and it is now common to make a comprehensive assessment of market competitiveness, based on surveys and composite indicators, by sector and across countries. Global competitiveness indices are published annually by the World Bank and the World Economic Forum ([www.weforum.org](http://www.weforum.org)) and others. The World Bank has published a range of regional competitiveness studies, including for the Caribbean (Tsikata, Pinto Moreira & Coke Hamilton, 2009).

Several other indicators of non-price competitiveness have emerged in the literature with some authors concluding that failure to account for these factors results in the misspecification of a country's export demand function. Specifically, a country's technological and structural framework can go some way to supporting its real exports (Monteagudo and Montaruli, 2009) and export market share (Magnier and Toujas-Bernate, 1994), even by way of financial sector development. Agénor (1997) posits that technological innovation can improve the quality characteristics of products, as well as influence the

development of new products. Numerous studies have used data on research and development (R&D) expenditure and number of patents as proxies for the pace of technological innovation within an economy (see for example Agénor, 1997; Sharma and Gunawardana, 2012; Montegudo and Montaruli, 2009; Madden, Savage and Thong, 1999; and Guichard, Cheung and Brézillon, 2009). Generally, they have found that technological competitiveness seems to support real exports, particularly those of manufacturing products.

Structural competitiveness, in the form of local and foreign investment, the development of human capital and the business environment, also contributes to export performance (see Athanasoglou and Bardaka, 2010; Guichard, Cheung and Brézillon, 2009). Again, Agénor (1997) suggests that non-price competitiveness is related to production potential, which is associated with investment and the capacity to innovate, particularly in capital-intensive industries such as manufacturing. This investment can be either locally or foreign-induced, measured by gross fixed capital formation (see Madden, Savage and Thong, 1999) and foreign direct investment (FDI) (see Guichard, Cheung and Brézillon, 2009) respectively. In Australia, for example, Sharma and Gunawardana (2012) show that the country's trade performance is largely explained by R&D, the reliability of the domestic supply, global demand and FDI flows in the long run, while Guichard, Cheung and Brézillon (2009) find that foreign investment positions and integration into global supply chains also help to explain the export performance of OECD countries. The latter authors go on to state that "...higher inward FDI may raise competitiveness through technology spillovers from the foreign affiliate to the host economy's broader measures of competitiveness. They also directly increase export performance if the foreign affiliate is used to produce inputs that are imported by the parent company or as a substitute export base for the parent company...."

The revealed comparative advantage (RCA) has also been cited as an indicator for whether a country derives a competitive benefit from a particular industry, relative to the world or a group of reference countries (Balassa, 1965). A country's relative export advantage is revealed by its observed trade patterns, and this measure is particularly useful in the absence of data on prices, productivity and/or factor costs. As such, it can capture both an economy's price and non-price competitiveness in its strongest sectors based solely on trade inflows (Balassa, 1965). In this paper, we measure the comparative advantage of each country in the provision of either goods or services relative to all Latin American and Caribbean countries. The index is computed as follows:

$$RCA_{ij} = \frac{\textit{Share of commodity } j \textit{ in country } i\textit{'s exports}}{\textit{Share of commodity } j \textit{ in reference countries' exports}}$$

where commodity  $j$  represents either the exports of goods or services. Hinloopen & Marrewijk (2001) felt it necessary to further evaluate the degree of comparative advantage held by a country, and developed four classes to do such. Class a:  $0 < RCA_{ij} \leq 1$  are countries with no comparative advantage in the industry; Class b:  $1 < RCA_{ij} \leq 2$  are countries possessing a weak comparative advantage; Class c:  $2 < RCA_{ij} \leq 4$  are countries with a medium comparative advantage; and Class d:  $RCA_{ij} > 4$  represents countries with a strong comparative advantage.

The literature has clearly established the difficulty of using the conventional REER as a basis for prescription and diagnosis about policies affecting exchange rates and trade. For countries whose growth depends entirely on exportables, this makes it imperative to switch emphasis to a more informative index of price competitiveness. Furthermore, non-price competitiveness measures provide

further insight into why countries may experience substantial growth in export performance, while appearing to hold no price advantage over their competitors. In the following section, we illustrate this for a group of Caribbean and Central American countries for which this may be particularly relevant, given their status as price takers in the global economy.

### ***Did the Caribbean really lose competitiveness in the last three decades?***

Caribbean and some Central American countries can be primarily characterized as being small open economies that are subject to international prices and shocks. Worrell (1992) makes the point that output in Caribbean countries may be classified into those products which earn foreign exchange (traded sectors: agriculture, manufacturing, mining and tourism) and those that need foreign exchange to grow. He goes further to illustrate their role as international price takers, explaining that their production levels are too miniscule to influence the ruling selling price of tradables and changes in production costs must be met by changes in output, new marketing strategies and technologies if they are to survive.

However, Griffith (2002) goes on to mention that the dependence of lesser developed economies, particularly those of the Caribbean Community (CARICOM) on more developed countries for their exports, is as a result of the small size of their economies and the colonial relationships that existed between these groups. He highlights the current production structure of Caribbean economies as one dominated by tourism (see also Worrell, 1992), with the major agricultural exports of sugar and bananas historically being exported under preferential agreements to more developed economies' markets. Only in some countries, (Trinidad & Tobago and Guyana for example) did mining; manufacturing and agriculture play significant roles in tradable goods production. Worrell (1992) also supported the fact that non-sugar agriculture exports from within the region are of little importance, while Trinidad & Tobago is CARICOM's only oil exporter. Manufacturing exports have grown in some of the larger countries, but declined in those smaller territories, while large scale production is constantly under threat from lower cost-producing countries. Furthermore, Jackman et al. (2011) showed that Caribbean small island developing states had generally improved their comparative advantages in tourism over most of the last decade. Again, this is primarily due to small island developing states' limited economies of scale in the manufacturing industry (Koonjul, 2004; UNESCO, 2010).

As a result of the dependence on tourism as a foreign exchange earner, a number of Caribbean countries have sought to further diversify their economies by moving into the provision of international business and financial services (see Worrell and Lowe, 2011a). These sectors serve as significant sources of foreign exchange and government revenue, with Barbados, for example, depending on the sector for more than half of its corporate tax receipts. Worrell and Lowe (2011a) go on to highlight the competitive advantages that Caribbean territories have in this area, including a highly skilled and professional workforce, relatively inexpensive professional labour, a long history of political and social stability and a regulatory framework that is on par with international standards. However, not all countries in the Caribbean basin have gone into this sector with the same levels of success, with the Cayman Islands, Bermuda and the British Virgin Islands being among the largest international financial centres (IFCs) in the world and the countries of the OECS having quite small sectors (Worrell and Lowe, 2011a). Nevertheless, while this sector has emerged as being critical to the development of Caribbean economies, Worrell and Lowe (2011b) highlighted that Caribbean IFCs' competitiveness in international finance, while holding firm in recent times, was still at threat from other world leaders in international finance such as Jersey and Guernsey, as well as a number of emerging competitors.

In terms of export performance, Caribbean countries have exhibited various levels of performance in both goods and services relative to the Latin American and Caribbean region. Appendix 1 shows the relative performance of exports as defined by Agénor (1997):

$$\frac{100 \times Exports_i}{Exports\ of\ reference\ group\ of\ countries}$$

where the reference group of countries includes all those of Latin America and the Caribbean.

The graphs show that most Caribbean and Central American economies have at the least maintained their relative performance in the export of services over the three decades in question, but that performance levels have dipped since the beginning of the new millennium. The major exceptions to this trend were Barbados, Suriname and Trinidad & Tobago, the latter two being primarily commodity producers. Barbados' decline, while the anomaly among service-driven industries, was not as drastic as in the case of Suriname and Trinidad & Tobago. Interestingly enough, Costa Rica, one of the larger economies, saw a marked increase in its services export performance over the period. In terms of goods performance, the results support the literature on small open economies, showing that, with the exception of the larger economies of Costa Rica and Panama, they all exhibited some decline in goods export performance as they struggle to compete against larger, low-cost producing jurisdictions with greater productive capacities.

Having established that the smaller territories of the Caribbean and Central America have maintained their relative performance in services, but experienced declines in the exportation of goods, we now seek to determine why this may be the case. Therefore, in order to speak to whether the Caribbean and Central America has lost competitiveness over the last few decades, we evaluate the PCI and RCA in goods and services for 12 countries over the period 1980 – 2010. The reference countries for each sector (tourism, agriculture, mining and manufacturing) are chosen based on the contribution of each sector to each country's tradable output. Therefore, if tourism represents the largest share of tradable output for Barbados, for example, then Barbados is included as a reference country for tourism. Table 1 gives the breakdown of countries based on the relative importance of each sector.

*Table 1: Breakdown of Reference Countries for PCI<sup>4</sup>*

<b>Tourism</b>	<b>Agriculture</b>	<b>Mining</b>	<b>Manufacturing</b>
Antigua & Barbuda	Dominica	Trinidad & Tobago	Costa Rica
Barbados	Grenada		Panama
Jamaica	St Vincent & the Grenadines		St Kitts & Nevis
St Lucia			

Source: Authors' calculations based on ECLAC data

The charts in Appendix 2 illustrate the calculated price competitiveness indices for each country. The results generally show that most countries have seen reductions in the prices of their tradable production relative to their regional competitors, while some others have just maintained their levels since 1980. Of interest is the observation that Trinidad & Tobago, Costa Rica and Panama have shown consistent improvements in competitiveness over the past three decades. These larger countries, most

<sup>4</sup> Suriname is excluded because the large depreciation of its currency in the early 1990s results in large outliers in the calculations.



of who are primarily commodity-producing territories, benefit from economies of scale in the production of goods relative to their smaller Caribbean competitors. That being said, they are able to produce all that they can at the ruling world price, at a relatively cheaper cost than the lesser resource rich countries.

Importantly, with the exception of Trinidad & Tobago and Costa Rica, those other two countries that have experienced continuous depreciations in their currencies relative to the U.S. dollar over the sample period (Jamaica and Suriname), have still experienced upticks in their relative price of tradables since the mid-1990s, despite Suriname's stark improvement immediately after 1993<sup>5</sup>. In contrast, most of the other countries of our sample have maintained fixed exchange rate regimes over the period and by and large have at the very least maintained their competitiveness over the past two decades. This result gives support to the view held by Worrell (1992), who stated that small open economies are price takers and must therefore adjust their output, and not price, in order to remain competitive. Thus, reductions in the exchange rate therefore, may not always be met with sustained improvements in price competitiveness and may in fact lead to higher input costs of raw materials and intermediate goods for those economies that depend heavily on manufacturing to earn foreign exchange.

Having estimated the price competitiveness of Caribbean and Central American countries, we now turn to calculating the revealed comparative advantages of goods and services for each territory (see Appendix 3). Except in the case of Suriname and Trinidad & Tobago, all countries exhibited increases in their revealed comparative advantages in services. Barbados, Jamaica and the islands of the OECS all possessed strong advantages in the export of services for the majority of the sample, and particularly in the last decade, despite some decline in relative export performance, as tourism in particular continues to dominate the current account receipts of these islands. Costa Rica and Panama were both able to achieve medium levels of comparative advantage in services over the past decade, while Suriname and Trinidad and Tobago experienced weak comparative advantages at best over the full sample.

As might have been expected, only Costa Rica, Panama, Suriname and Trinidad and Tobago were able to maintain their levels of relative advantage in the provision of goods to the international market. However, of these, only the latter two actually held weak advantages over the period, while Costa Rica and Panama failed to exhibit any advantage at all. In both countries' cases, this is understandable given their relatively better performance in the exportation of services over the past three decades.

In terms of the performance of Caribbean and Central American countries in the area of international finance, the authors were not able to uncover any studies that sought to establish a country's level of competitiveness in this area. Nevertheless, given the sector's importance to some of these small jurisdictions, we thought it prudent not to overlook a potential measure of competitiveness for this sector.

The most reliable measure that came to light was the degree of centrality, developed by Cihak et al. (2011) and put in to practice by Worrell and Lowe (2011b) in order to measure the importance of a financial system to that of the global network. Worrell and Lowe (2011b) provided some clues as to how this measure may be used to measure the relative importance of Caribbean IFCs and used the following calculation in their analysis:

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<sup>5</sup> Suriname represents one of the larger economies in our sample, and may in fact have some capacity to substitute imports for domestic production, which may be limited for the smaller countries of the Caribbean.

$$\frac{\text{Total External Assets of Country}_i + \text{Total External Liabilities of Country}_i}{\text{Total External Assets and Liabilities of reference country(s)}}$$

In the analysis that follows, the group of reference countries chosen is the segment of countries classified as Offshore Centres by the Bank for International Settlements (BIS) and the external positions of banks are taken from the BIS' Locational banking statistics which capture the cross-border interbank holdings of internationally active banks located in a particular country. This measure provides us with some insight as to the revealed importance of an IFC, relative to its direct global competitors.

Appendix 4 provides a graphical illustration of the calculated degrees of centrality for selected Caribbean and Central American countries<sup>6</sup>. Data on banks' external positions is not currently available for Antigua & Barbuda nor St Kitts & Nevis, so for the purpose of comparison, they are replaced by two of the larger IFCs in the Caribbean, Bermuda and the Cayman Islands. Nonetheless, the charts provide evidence that relative to their peers, the smaller, less naturally resource-rich countries of the Caribbean have increased their market share of the global financial system, despite some drop off in competitiveness over the last decade. Bermuda has lost some of its advantage over time, but remains the exception among the smaller territories. The larger territories of Jamaica, Trinidad, Suriname and those of Central America, having placed arguably less emphasis on international financial services, have lost some ground over the past three decades.

Caribbean IFCs' levels of competitiveness have suffered somewhat since the early 2000's as initiatives by the G20 and OECD have placed pressure on so-called tax havens to improve the transparency of their tax practices (Almeida, 2004). As many small, Caribbean IFCs have low or no taxes, they were now placed under the scrutiny of the international community, in a very negative light. This scrutiny subsided somewhat in the years that followed, but reemerged in full force after the 2007/2008 financial crisis, when small IFCs became the scapegoats for their misunderstood role in that meltdown (Global Financial Centres Index, September 2011).

Overall then, the countries of the Caribbean and Central America have been able to maintain competitiveness in their respectively strong sectors, despite exhibiting some fluctuations in export performance over the past three decades. Most countries, particularly those with fixed exchange rate regimes, have been able to maintain or improve their price competitiveness relative to their regional peers, while improving their comparative advantages in the provision of services. Given the changing structures of most of these economies from agricultural to tourism-focused territories (see Worrell and Lowe, 2011a), their export performance and revealed advantages in the provision of goods have been somewhat different stories. The Caribbean's performance in international finance has also been particularly encouraging for those territories that have placed emphasis on this sector as a means for further economic diversification. However, the question still arises as to what non-price factors play a role in influencing these small economies' competitiveness and their relative export performance.

### ***What other factors influence the level of competitiveness and export performance?***

As outlined in the reviewed literature, a number of non-price factors influence countries' level of competitiveness in the provision of goods and services. These include both technological and structural factors such as expenditure on R&D, the number of patents within the manufacturing sectors, local and foreign investment, the ease of doing business, stock of human capital and the level of global demand

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<sup>6</sup> Estimates scaled up 1000 times

for goods and services. In this section, we investigate what factors play a role in the competitiveness of Caribbean and Central American economies.

Consistent data for R&D and patents is largely unavailable for the Caribbean & Central America and as such, the technological competitiveness of these economies cannot be appropriately assessed. In addition, data on the ease of doing business and human capital, variables cited as being vital to competitiveness in international business and financial services (see Global Financial Centres Index, September 2011), are largely unavailable for the Caribbean and hence, there is limited scope for evaluating the determinants of Caribbean IFC competitiveness. However, structural factors such as Gross Fixed Capital Formation and FDI are available, while the global demand for goods and services can be proxied by growth in World GDP, as obtained from the World Bank's World Development Indicators (WDI).

Appendices 5 and 6 display trends in Gross Fixed Capital Formation (GCF) and FDI respectively for each country over the past three decades, while Appendix 7 shows World GDP for the sample period. Gross Capital Formation has grown steadily for most countries over the period, with the major dip coming in the period following the global economic downturn of 2007/2008. The ratio of GCF to total GDP has fluctuated significantly but the general trend indicates that relative investment in the Caribbean and Central America began to see a sustained rise from the mid-1990's to 2000, only for it to drastically drop off in the latter part of the last decade. It is possible that this growth came about from an increase in these countries' stock of public debt to finance increased investment during a relative fruitful period for most countries in the world economy. However, with the advent the financial crisis, many of these governments found themselves with unsustainably large debt stocks and therefore, in an effort to consolidate their fiscal positions, reduced their outlays of capital expenditure. Inflows of foreign direct investment also followed a similar trend, picking up appreciably in the last decade, but falling off in the latter 2 – 3 years.

Export performance is obviously hinged on the outturn of the traded sectors, and in Appendix 8, we see that growth in the traded sectors of the Caribbean and Central America has been relatively flat at best in the latter ten years of our sample, with Costa Rica, Panama, Suriname, Trinidad & Tobago and to a much lesser extent, St Kitts & Nevis being the exceptions. Again, the traded sectors have been affected by the global downturn, with all countries experiencing declines immediately following the 2007/2008 U.S. financial system crash.

Though not the focus of this paper, it is still important to note that a material portion of domestic investment in many Caribbean states comes by way of Government's capital expenditure programmes on roads and other public construction projects. Therefore, while adequate data may not readily be available on investment by sector, it may be fair to note that much of this is probably concentrated in the non-traded sectors of the economy. This, coupled with the declining share of Gross Fixed Capital Formation in GDP over the last ten years, suggests that the recent decline in export performance may be due to insufficient investment in the foreign exchange earning sectors of the economy.

As the export of goods and services depends primarily on output from the tradable sectors and small open economies' international competitiveness depends on their ability to produce and sell at the going rate in international markets (Worrell, 1992), it may be useful to test whether our factors aid in explaining the Caribbean and Central American countries' output in tradable goods and services. To do this, a panel least squares regression with country-specific effects is estimated for the 12 countries for the period 1980 – 2010, using the following relationship:

$$Y_{it} = f\{Y_{it-k}, ADG_{it-k}, FDI_{it-k}, GCF_{it-k}, PCI_{it-k}, RCAS_{it-k}, RCAG_{it-k}, DUMMY_{it}\}$$

where  $Y$  represents output in the tradable sectors,  $ADG$  is growth in world aggregate demand,  $FDI$  and  $GCF$ , foreign and domestic investment respectively and  $PCI$  is our price competitiveness index. In an effort to reduce the level of multicollinearity between the revealed comparative advantage variables,  $RCAS$  and  $RCAG$  (revealed comparative advantages in services and goods respectively), are multiplied by dummy variables which capture whether a particular economy is service or goods oriented. For our purposes, Costa Rica, Panama, Suriname and Trinidad & Tobago, given the size and structure of their economies, as well as their maintaining their calculated levels of RCA in goods over the past three years are chosen as the goods-producing nations, while the other eight countries are service-oriented. Finally,  $DUMMY$  accounts for outliers in the residuals. As the dataset uses annual data, a maximum lag length of 2 years is chosen for the general equation.

Panel unit root tests and visual inspection are used to determine the order of integration of each variable, and  $Y^7$ ,  $FDI$ ,  $RCAS$  and  $RCAG$  were all found to be integrated of order 1 and hence each was differenced to achieve stationarity. Table 2 presents the reduced results of our estimation.

Table 2: Panel Fixed Effects Regression Estimates (Dependent Variable: Tradable GDP Growth)

Variable	Coefficient	Std. Error	t-Statistic	Probability
Constant	-0.009	0.018	-0.485	0.628
DLOG(YT)	0.082	0.036	2.246	0.025
ADG	0.012	0.002	7.214	0.000
GCF	0.001	0.000	1.663	0.097
PCI	-0.022	0.012	-1.841	0.067
D(RCAG)	0.440	0.106	4.171	0.000
DUMMY1	-0.499	0.043	-11.566	0.000
DUMMY2	-0.255	0.025	-10.308	0.000
DUMMY3	0.283	0.028	10.060	0.000
DUMMY4	0.171	0.023	7.478	0.000
DUMMY5	-0.169	0.025	-6.665	0.000
DUMMY6	0.147	0.023	6.385	0.000
Adjusted R <sup>2</sup>	0.608			
Jarque-Bera Statistic	3.084			0.214
Q-Stat (1 lag)	0.510			0.475
Q-Stat (2 lags)	0.574			0.750

Source: Authors' calculations

The results generally support our graphical analysis, as world demand and local investment both increase traded output growth, while reductions in a country's price of its tradables relative to its competitors also seem to improve production, as the country is able to produce its output at relatively cheaper prices. More importantly though, our indicators for revealed comparative advantage give somewhat intuitive results, as though the serviced-oriented countries with revealed comparative advantages in services do not seem to benefit from increased growth when their advantage increases, those more focused on agriculture, mining and manufacturing gain when their advantage in the provision of goods increases relative to their peers.

<sup>7</sup>  $Y$  was logged prior to unit root testing.

## **Conclusion**

This study sought to develop and establish appropriate measures of price and non-price competitiveness for Caribbean and Central American economies. Traditional measures such as the REER have been found wanting, and do not provide relevant indicators of the capacity to produce and sell goods for export in global markets.

Generally, the results suggest that Caribbean and Central American economies have become more price competitive over the past three decades, with the exceptions being some countries that may have experienced rapid currency depreciations over that period. In addition, most countries have been able to gain comparative advantages in the area of service exports, given the small size of their economies, with some of the larger territories holding firm in their provision of goods relative to their peers. Also, preliminary measures show that those countries that have sought to diversify their economies into international financial centres have been able to increase their market share of global finance.

The results also provide initial evidence that world demand, domestic investment and improving price competitiveness help to explain increased growth in production within Caribbean and Central American countries' tradable sectors. In addition, those Central American countries in the sample and Trinidad & Tobago saw increased tradable growth due to improvements in their revealed comparative advantages in the exportation of goods. For future research, variables such as expenditure on R&D, ease of doing business and human capital may help to further explain the technological features of Caribbean and Central American countries' non-price competitiveness in goods, services and international finance.

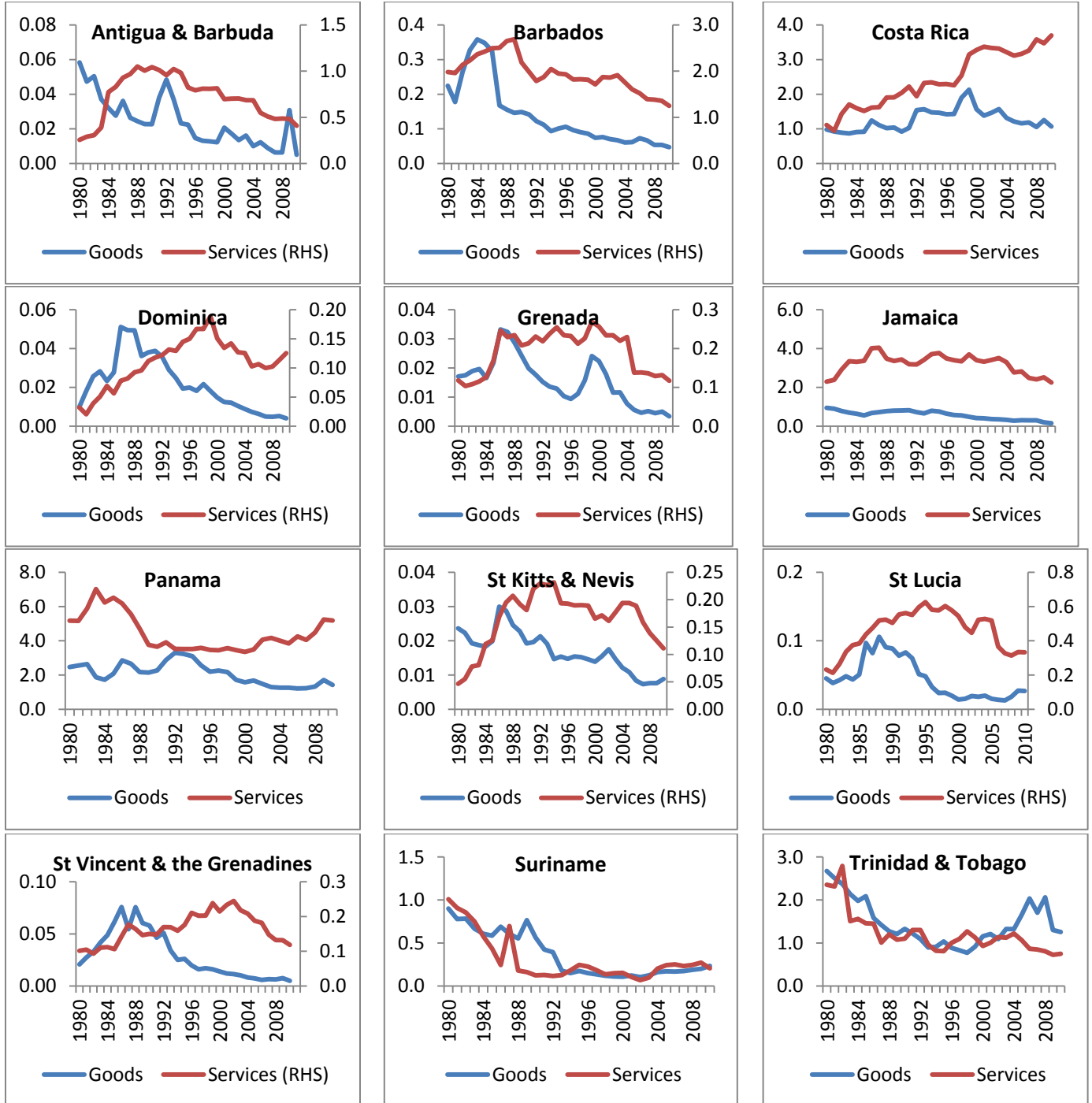
These results present a number of implications for regional policymakers, particularly in the context of the current economic climate. While the need for fiscal consolidation is clear, governments and the private sector would be well advised to maintain investment in the productive sectors of the economy in an effort to stimulate growth in these countries' foreign exchange earning sectors in the near future. Also, given the relatively lower price competitiveness found in some countries that experienced currency devaluations in the past, the small open economies of the Caribbean should resist calls to devalue their long-standing pegs to the U.S. dollar, in anticipation of any misconceived long-term increases in price competitiveness. Finally, given recent initiatives targeting small international financial centres, particularly those in the Caribbean, regional IFCs should seek to maintain compliance with international regulatory and supervisory standards, so as to maintain the high reputation and growing market share that they have so far been able to achieve.

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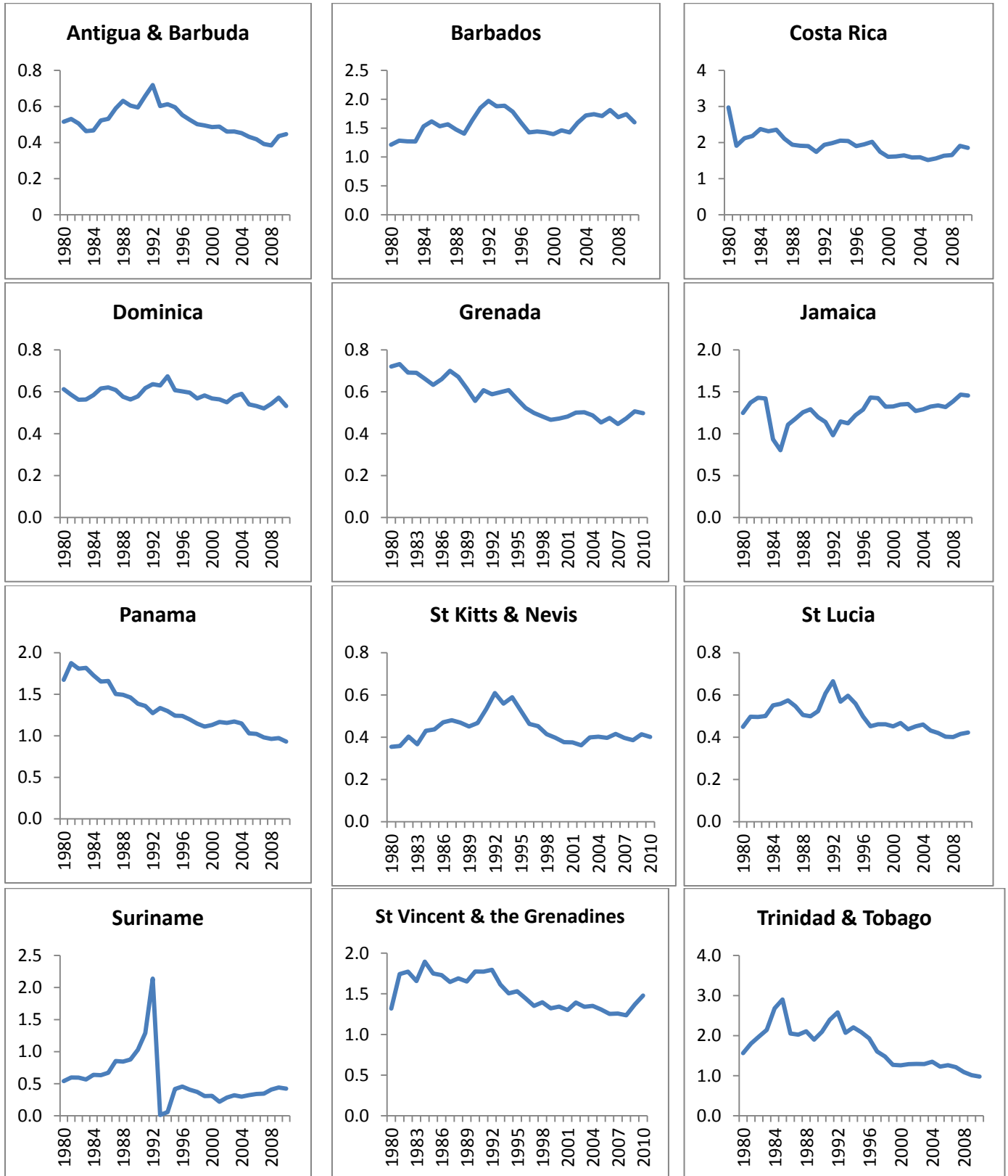
Appendix 1: Relative export performance for Caribbean and Central American Countries



Source: ECLAC and authors' calculations

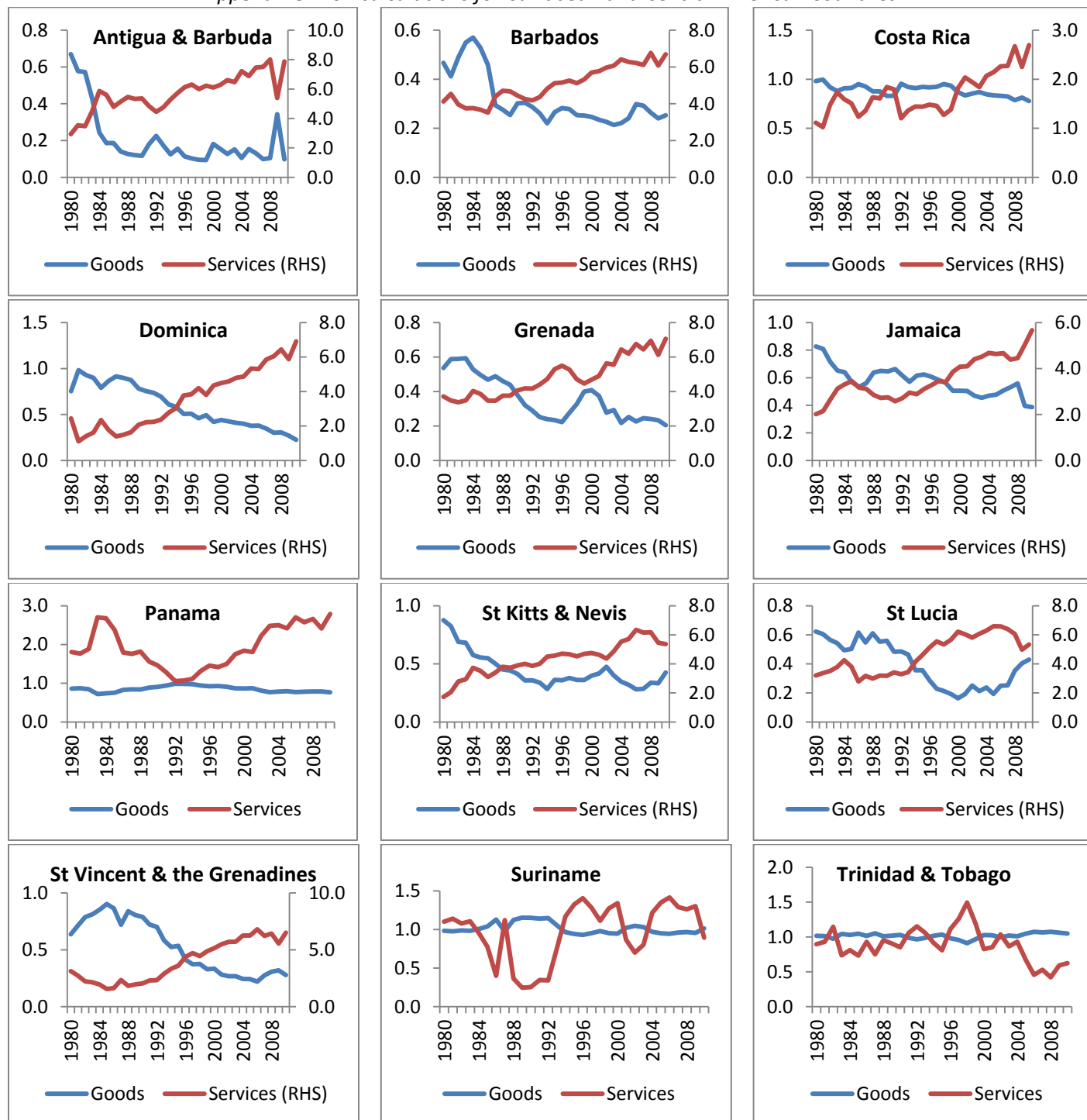


Appendix 2: PCI calculations for Caribbean and Central American Countries



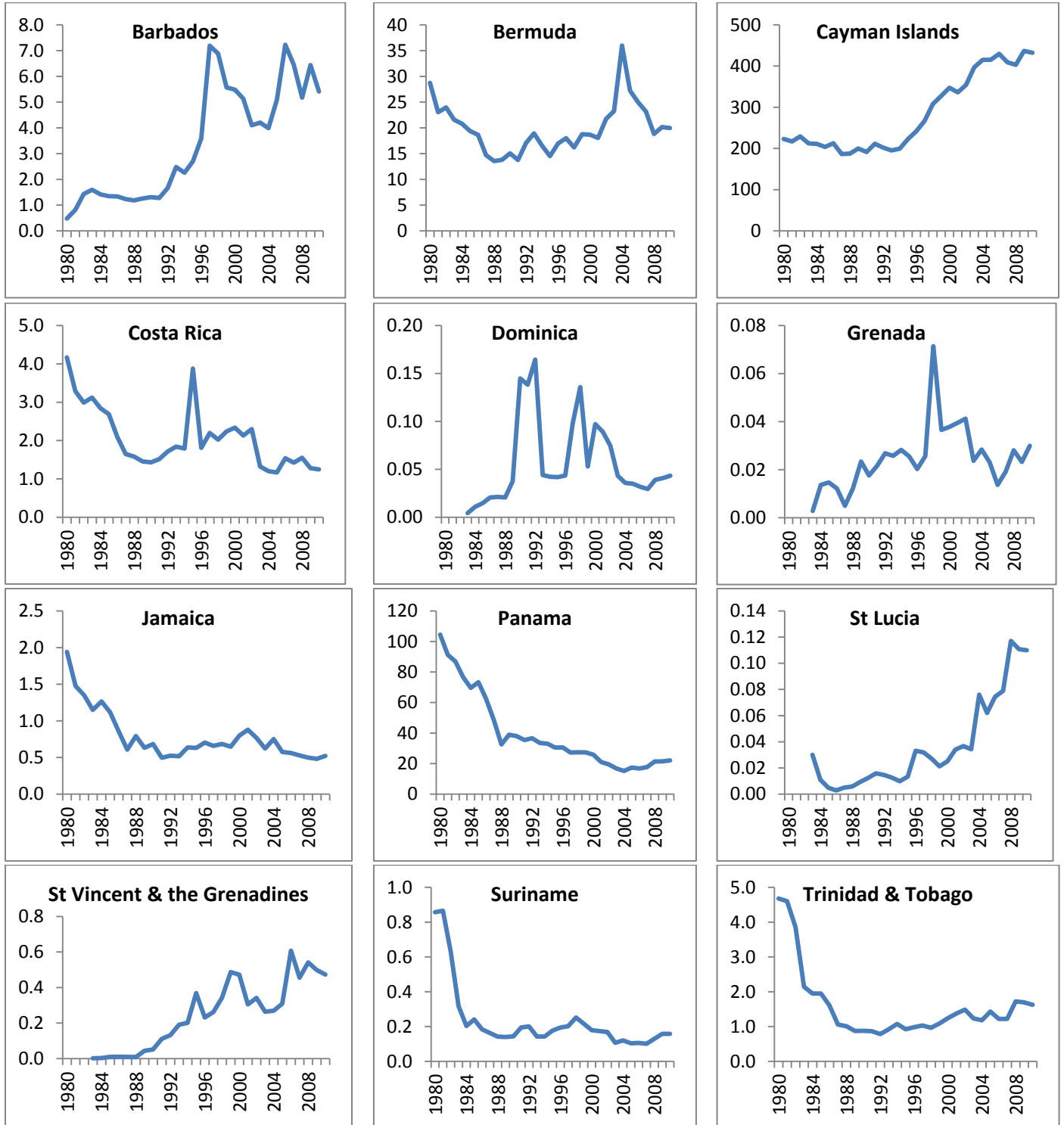
Source: ECLAC and authors' calculations

Appendix 3: RCA calculations for Caribbean and Central American Countries



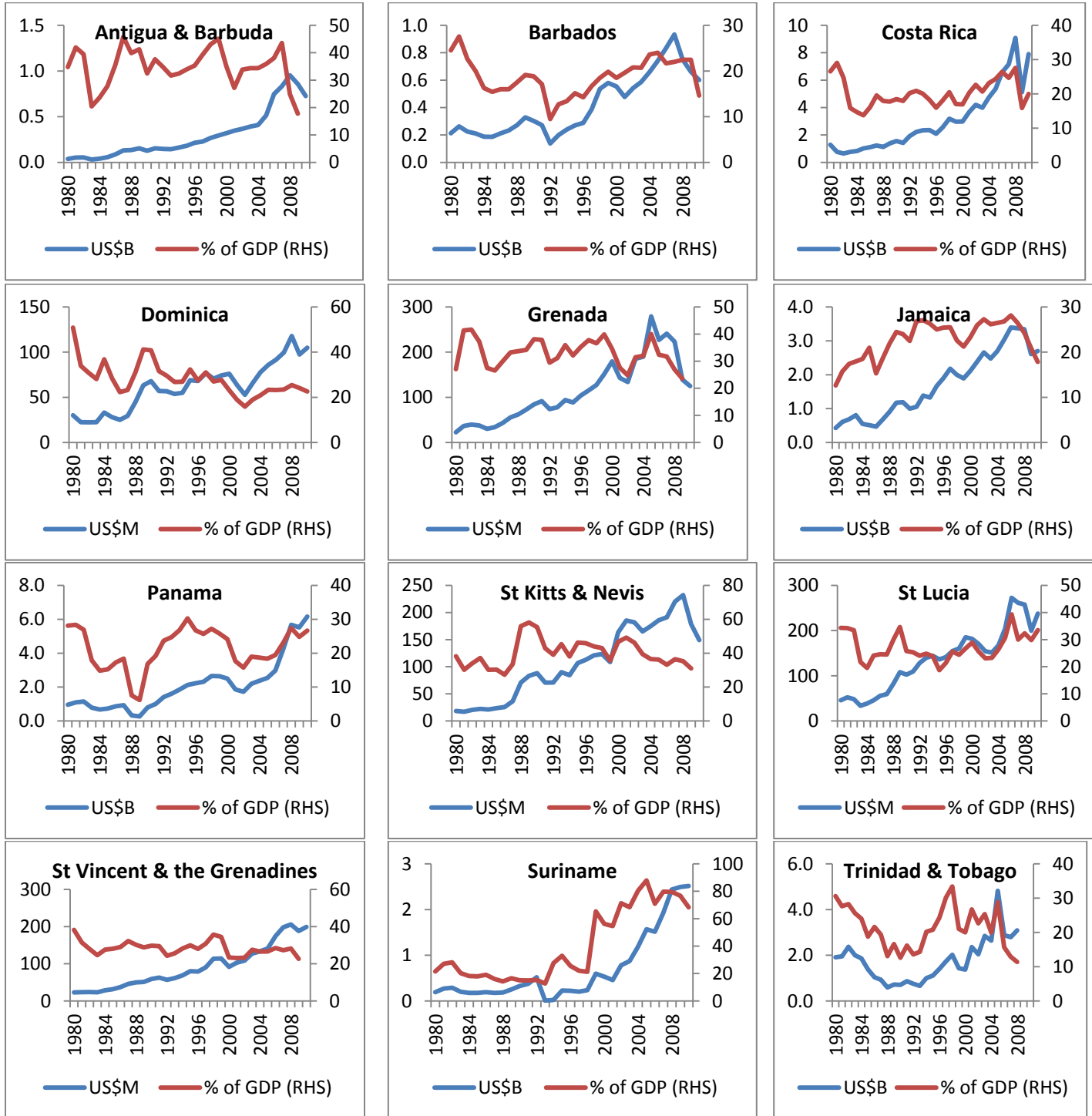
Source: ECLAC and authors' calculations

Appendix 4: Degree of Centrality calculations for Caribbean and Central American IFCs



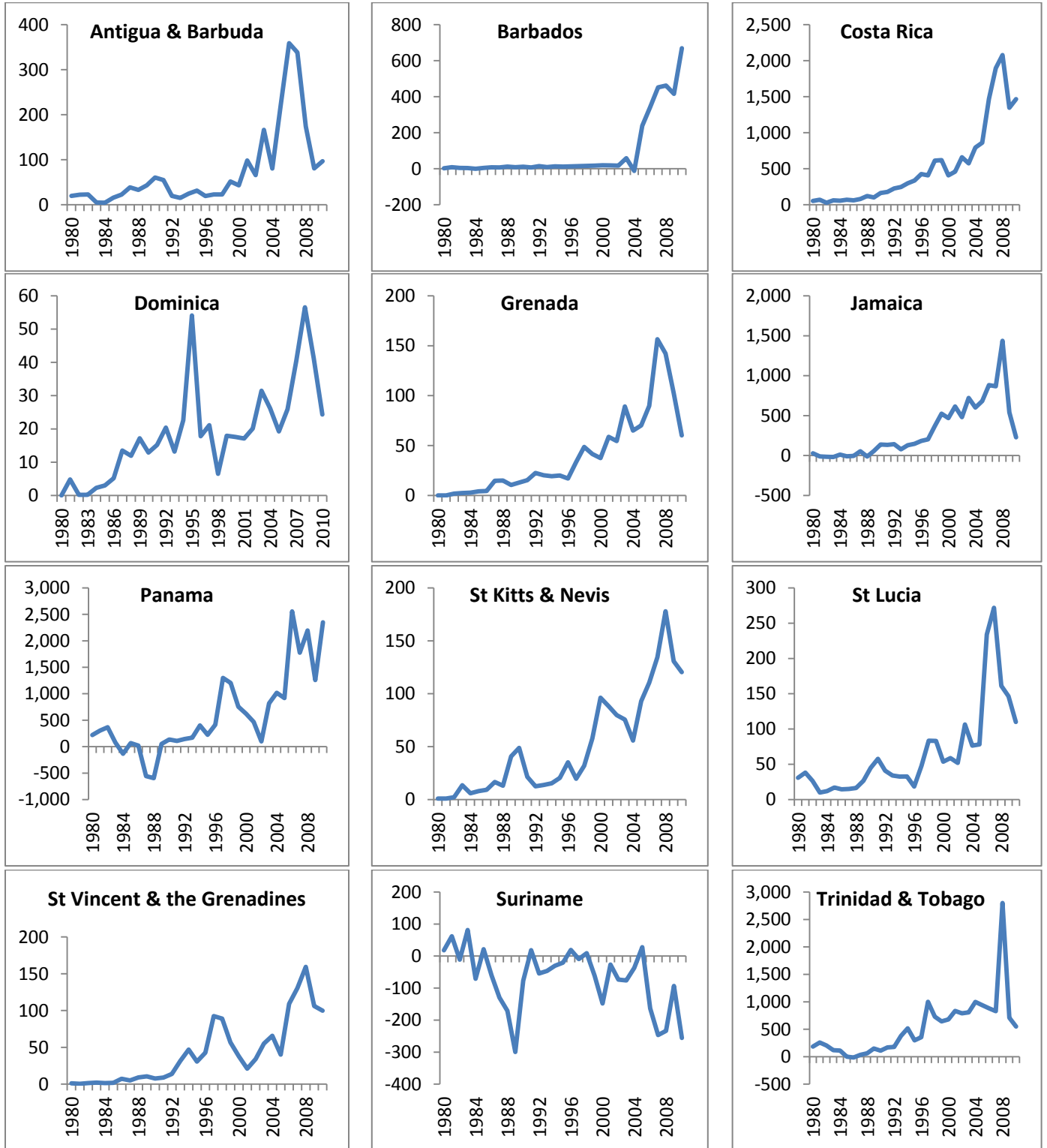
Source: BIS and authors' calculations

Appendix 5: Gross Fixed Capital Formation for Caribbean and Central American Countries



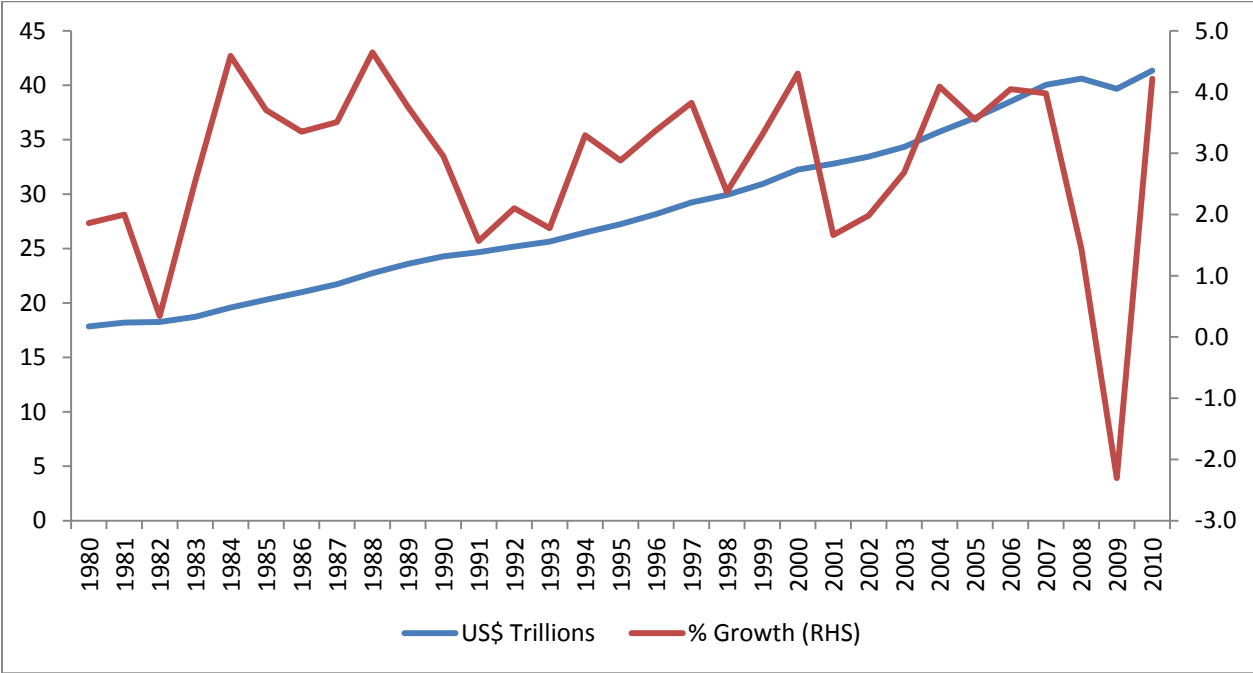
Source: ECLAC, UN and World Bank WDI

Appendix 6: Foreign Direct Investment (US\$ Millions) for Caribbean and Central American Countries



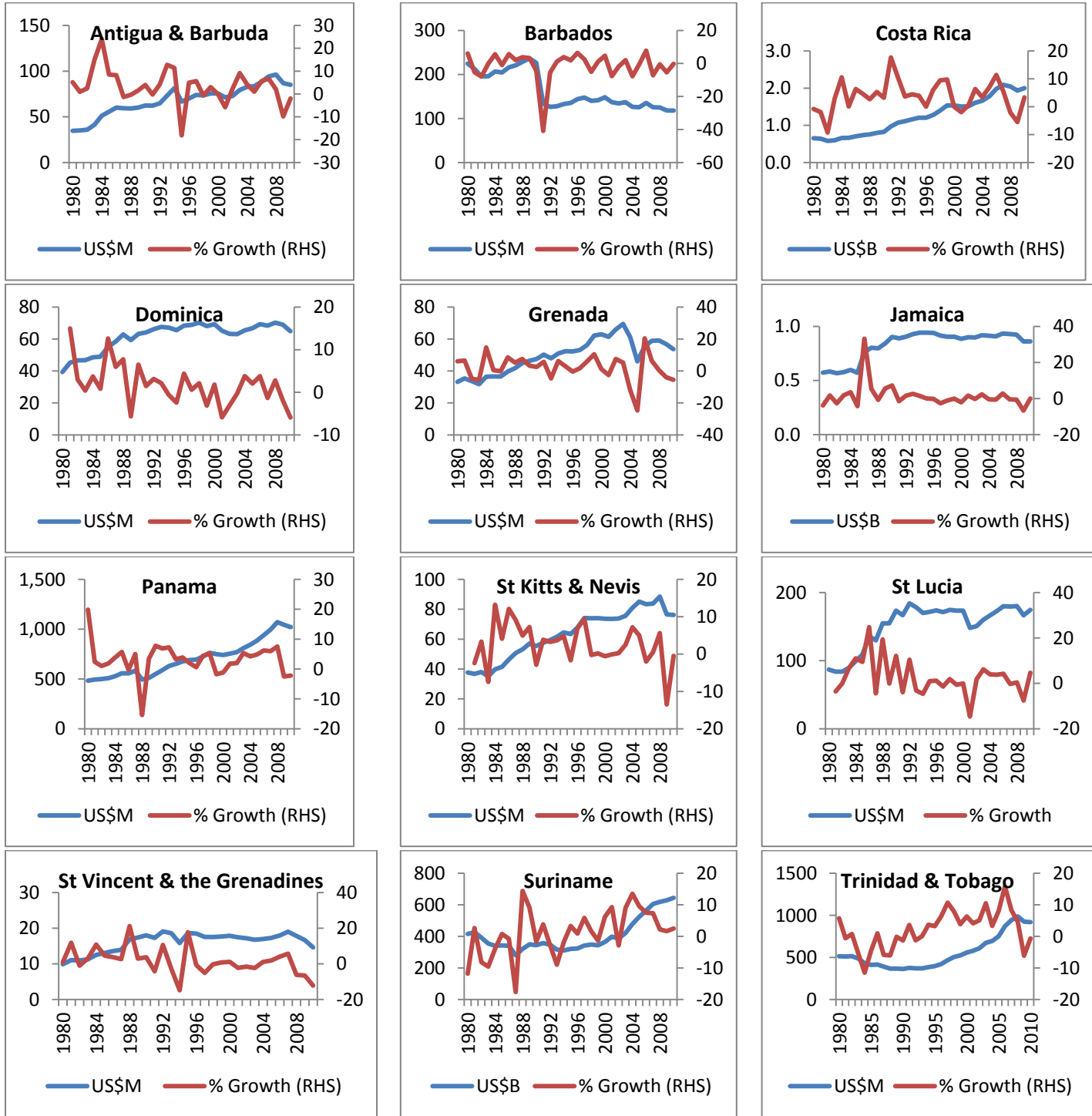
Source: World Bank WDI

Appendix 7: World GDP Growth



Source: World Bank WDI

Appendix 8: Real Traded Sector Output for Caribbean and Central American Countries



Source: ECLAC