

# The Role of the State<sup>1</sup>

for the study:

## *Caribbean Development in a Globalized 21. Century*

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## **I: Introduction and summary**

What is the role of government in enhancing welfare, in a sustainable way, in the Caribbean countries? The present analysis sheds light on this question, keeping in mind that the Caribbean countries as a group generally

- € have shown disappointing growth rates;
- € have high debt levels;
- € do not see scope for general expansion of government in the economy;
- € see limited capacity, including a limited pool of qualified people, as a possibly limiting factor for the ambitions of government;
- € see increased transnational cooperation within the region, including through directly shared functions, as a potentially fruitful strategy.

More specifically, the following analysis attempts to answer the following questions:

- € What basic choices exist for a small state with respect to important functions of government, and how can these be put in context and evaluated?
- € In key governance areas (rule of law, corruption, crime), how do the countries of the Caribbean perform, and what can be the important areas of improvement.
- € In the ‘productive enterprises’ of government, for instance education, health, the question of ‘an overstretched state’ is an important one: are expenditure levels comparatively high, output levels (and quality) low (in so case, more detailed diagnostic studies may be warranted).

And, as a main aim of the analysis:

- € Are there specific challenges common to these countries, related to factors such as their small populations, their openness to trade? Specifically, are there reforms to be explored related to coordination between countries, greater (or different) scope for a private sector role?
- € For important development drivers – such as the main budget items for the public sector, and the determinants of foreign and domestic investment, what are key constraints to be addressed by government?

The chapter builds on (and presently refers directly to) inter alia two background studies: The productive enterprise of government in small Caribbean states (Eskeland and Nikitin) and Promoting investment in small Caribbean States (Eskeland, Kolstad, Villanger), both conducted as desk studies mainly on the basis of existing literature and data publicly available.

*Plan of the chapter and summary of findings.*

In section II, the motivation for this study of the role of government is anchored in the objective of sustained growth and welfare improvements. In *sustained* lies an institutional orientation: it is recognized that at the policy level many recommendations for government

may be known, and the need may be greater for recommendations that can change the day to day pressures of politics, towards a greater focus on the long term.

In section III, we analyse government expenditure patterns, in particular in the health and education sectors. Inspired by the question of whether their small populations present these countries with particular challenges, we pay particular attention to issues of scale, and institutions. We find evidence that the small scale of population for these countries have implications both for costs of service and for expenditure patterns. There are distinct patterns in a world sample of countries – and reflected in the Caribbean – that small countries face higher costs of production in such important government enterprises as the health and education sectors. This, together with the now frequent proposals that the countries can be service exporters in areas such as education and health (and also the emphasis on regional labor markets) provides at least a hint that coordination across countries may be worthy of consideration. We also introduce the topic of governance institutions, through governance variables of the World Bank's KKZ data set. It is possible, of course, that some issues of scale economy relates more to how small countries govern themselves, including their political economy, than to scale economies in an engineering sense.

In section IV, we extend the focus on the role of government to the determinants of investments. A thorough analysis of what can stimulate investment (foreign as well as domestic) in the Caribbean results in recommendations that are very similar to what one would have gleaned from other, comparable studies. Investment in the Caribbean countries can be enhanced by better institutions, educated work force, infrastructure, openness, more moderate debt levels, and so on. We highlight the possibility, however, that the countries' small size and proximity to each other result in particular challenges in a) excessive competition and b) difficulty in focusing on long term sustainability, as opposed to short term gains and opportunism. Thus, while this recommendation is built in part on judgment and not comes clearly out of the analysis, the analysts believe the policy environment would be more likely to improve over time if efforts to coordinate between the Caribbean countries were to bear fruit.

In section V, we again turn focus towards governance institutions, this time trying to examine its determinants and whether anything particular pertains to small states. The conclusion is that it does. Caribbean countries and small states seem to come more easily to some governance qualities (democratic ones, like *voice and accountability*) than to such qualities as *rule of law*, and *quality of regulation*. This can mean that these other qualities are worth examining, both because they may be constraining growth and because they may require different approaches.

As a conclusion, the study has found ample evidence that scale issues, and thus coordination initiatives across Caribbean states, can be relevant to sustained growth opportunities. Investors are looking for improved governance and government finances, trained workers, infrastructure, openness and integrated markets. Government finances are strained, as reflected in high debt levels, emphasizing that increased human capital must rely on more efficient health and education services, rather than increased expenditures. In all three areas: health, education and governance, identified scale issues point to potential in coordination across states, though at the same time these require in-depth sectoral analysis. It is indeed possible that such coordination is impossible or fruitless to pursue without jeopardizing other cherished qualities, such as a functional and direct democracy in a small sovereign state. But more likely, there are opportunities to cooperate in areas such as health, education, regulation

and business climate – opportunities that can be pursued at a pragmatic and sectoral level, making choices along the way. Discussing these opportunities likely can itself be a productive experience.

## II: Motivation: Sustained welfare improvements

The motivating factor of this chapter is human welfare, and Table 1 highlights some important indicators. We display these indicators with two comparator groups: Countries with less than 10 million people, and Latin America without the Caribbean countries<sup>2</sup>.

GDP, or national income per capita, is a measure of consumption possibilities, and thus an important welfare indicator in itself. The Caribbean countries – a group not more heterogenous than the two others – are richer than those of Latin America but less well off than countries with population less than 10 million (Table 2.1).

Education and health indicators are widely accepted as welfare indicators in themselves, as reflected in their prominence within the millennium development goals (MDG). But they are also valuable as instruments to achieve other goals, such as productivity and income growth, enhanced democracy and governance, etc. Education and health indicators are also - along with unemployment – indicators of inequality and social exclusion. Secondary enrolment is of course not more important than is primary enrolment, but the variable is a better indicator to distinguish between countries (though it barely grasps essential quality aspects of education). The Caribbean countries on average have higher unemployment than the comparator groups, but have a fairly low child mortality rate and a fairly high secondary school enrolment rate.

**Table 2.1: Indicators of Human Welfare, Averages 1995-2002.**

	Caribbean	Population < 10 mln.	Latin America w/o Caribbean
GDP per Capita, PPP 1995, '000	6,7	7,9	6,2
Gross Secondary Enrolment, %	77,6	66,5	65,6
Mortality Rate, Under-5, per 1000.	35,7	63,0	33,9
Unemployment, % of Labor Force	15,1	10,3	8,7

Averages, 1995-2002. Source: WDI, others

### *A view towards the role of government*

The orientation of the chapter, though, is the role of government, and how government policies can be conducive to enhanced and sustained growth in human welfare. Thus, one will be focusing in part on variables under fairly direct control of government, such as its public expenditure program. In the Caribbean, with 18 percent of national income as total government expenditure, more than half of government expenditures is used in the education and health systems (Table 2.1, from IMF's GFS data base). This share is higher than for the two comparator groups. In part for this reason, in part because the goals of intervening in

<sup>2</sup> The Caribbean countries here are Antigua and Barbuda, Bahamas, Belize, Barbados, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, Suriname, Trinidad and Tobago, St. Vincent and the Grenadines.

those areas are closely related to classical goals and for Millenium development goals, we shall pay some attention to analysing those expenditure items.

Government in general can, of course, also become an important obstacle to development, most notably if demands on government are such as to render gross inefficiency or excessive ambitions. Government can become a weak service provider, an unreliable contracting partner, and a burden for citizens and private sector development. For this reason, a focus is also kept on indicators such as inflation and debt levels (Table 2.2), both suited to give some idea of these constraints (also, on governance variables, below). Debt levels measured in net present values are of course lower than they would be if measured at face value. All of these three country groups, therefore, have debt levels which may be of concern – it depends on growth prospects. Long term averages of inflation around ten percent are of concern, but only if current deficits combine with poor long term financing options. Again, these considerations command a focus on private sector growth prospects.

**Table 2.2: The Role of Government: Fiscal Aspects, Averages 1995-2002.**

	Caribbean	Population < 10 mln.	Latin America w/o Caribbean
Final Consumption Expenditure of General Government, % GDP	17,9	18,0	12,9
Public expenditure on education, % GDP	4,9	4,7	4,0
Public expenditure on health, % GDP	3,3	3,7	3,5
Inflation (Consumer Prices), Annual %.	9,5	10,0	12,1
Present Value of Debt, % GNI	75,4	74,5	51,4

Source: WDI.

#### *A view towards underlying conditions; institutions*

But we shall also be focusing on issues under less direct, short term control of government (Table 2.3). These include: given country characteristics, such as population, as a measure of country size. The Caribbean countries, here including DR and Haiti, with more than five million people each, constitute a heterogenous group with respect to size and income, but so do the other groups. Between themselves, of course, the Caribbean countries have a lot in common, such as the proximity which allows opportunities in terms of labor market integration and trade, their natural characteristics and proximity to the Americas, etc. Measured by imports and exports, the Caribbean countries are very open, but this is ‘natural’ and necessary for small economies, so the economies may still have gains available from further integration. Finally, there are institutional and governance variables, such as *voice and accountability*, and *rule of law*, and finally gross capital formation, or investment<sup>3</sup>. The Caribbean average for governance variables is fairly high for *voice and accountability* (democracy and freedom, basically), but no better than the comparators for a *rule of law*, a difference we shall look further into below.

<sup>3</sup> Based on multiple surveys, a data set on six governance variables is now suited for comparison among more than 150 countries. The Kaufmann, Kraay, Zoido Lobaton (KKZ) variables are constructed so that a higher value means better, they have a mean equal to zero and a standard deviation equal to 1. They are: *Voice and accountability*, *Political stability*, *Government effectiveness*, *Quality of regulation*, *Rule of law*, and *Control of corruption*.

**Table 2.3: A Brief Glimpse of Factors, not Directly or Easily Changed by Government, Averages 1995-2002.**

	Caribbean	Population < 10 mln.	Latin America w/o Caribbean
Population, million	1,48	2,78	20,95
Openness (Imports+Exports), % GDP	111,17	100,33	69,03
Voice & Acc-ty (KKZ)	0,70	0,14	0,19
Rule of Law (KKZ)	0,12	0,10	0,00
Gross Capital Formation, % GDP	26,94	23,98	20,62
GDP Growth, Annual %.	2,70	3,80	2,66

Source: WDI.

*The rationale for government intervention – and towards an institutional focus*

There are numerous, well-researched and well-founded principles to guide the role of government under these fairly general welfare objectives and conditions. The most important ones of these come out of normative welfare economics. This is a framework that emphasizes the role of the private sector, of markets, specialization and voluntary associations in organizing many sides of society's needs. Richard Musgrave, for instance, would associate with government three basic functions:

- € Macroeconomic management and stabilization (low inflation, sustainable deficits);
- € Redistribution (compassion, insurance, liquidity constraints<sup>4</sup>, cohesion, stability);
- € Allocative functions, related to externalities, public goods, monopolies, etc (pollution taxes, police and judges, public health, utility regulation).

*Institutional focus*

Notwithstanding the validity of these important guidelines (which will be kept in mind, below), additional perspectives often are added when one asks not only for advice on each of the three agendas above, but also what can make it possible or likely that government will be able to follow such advice.

Examples of such an institutionally angled recommendations, for the first of the above functions, could be the now popular recommendation:

- € To have the firmness in monetary and other policies required for deficits and inflation consistent with sustained private sector growth, one needs an independent central bank, and perhaps interjurisdictional coordination of the central banking functions and fiscal policy limits.

Additionally, however, the modern institutional agenda focuses to a greater extent on the government as a rule-maker and as an enforcer of rules, and on the more general preconditions for coordination. Thus, one can be interested in the determinants of government behavior: on various aspects of governance, and on the role of civil society and other institutions in improving this coordination<sup>5</sup>.

Thus, the following analysis will be flavoured by the following choices:

- € an orientation towards institutional issues: more on the preconditions and reforms suitable for good policies and accountability to follow, than on policies themselves;
- € an orientation towards the special conditions common to the Caribbean countries: small size and proximity to each other, in particular.

<sup>4</sup> Liquidity constraints can give an efficiency-based rationale for redistribution as follows: Poor people may be unable to borrow for projects with high (individual and social) returns – such as education, so that redistributive programs can be efficiency enhancing.

<sup>5</sup> A suitable definition of institutions is *rules and organizations*. World Development Report 2003, Institutions for sustainable development focused on the role of institutions in coordination.

We pursue this agenda by analysing three important dimensions of government functions:

- € government in its productive enterprise: in its capacity of providing services as a producer (or perhaps as procuring such services): its provision of education, health and infrastructure services;
- € the governance enterprise of government: the rule-making, decisionmaking and law-enforcing and facilitating functions, and
- € investment, and the role of government in facilitating it.

### **III: The productive enterprise of government: Health and education expenditures**

As public sector expenditure programs go, the health and education sectors are associated with specific outputs and service goals, facilitating analysis. As touched briefly on above, the output goals of the health and education enterprise are important for human welfare directly – through quality of life and wellbeing. But they are also important instrumentally, laying the foundation for a productive and agile workforce, for specialization, integration, democratic development, etc.

As productive enterprises of government these sectors also are suitable areas to focus on in a simple analytical sense. We shall try to look into whether there are issues of scale economy important to government functions in Caribbean countries, and then these two activities to which government dedicates over half of its resources represent a valuable laboratory.

*Scale, and higher level structures:* It is indeed conceivable that there are scale economies in education and health sectors over and beyond what can be fully exploited within individual countries around the one million people mark (the Caribbean countries roughly lie in an interval of one million, plus minus a factor of ten). If so, however, just as there are structures above health districts and provinces in larger countries (structures such as universities, ministries, administrative systems) it is also conceivable that joint functions could serve similar purposes for a group of neighbouring, similar countries.

#### **Scale and higher level structures in the Caribbean**

A cricket team from the West Indies is not the only example of achievements in the Caribbean benefiting from scale beyond what is feasible in each small country. The University of the West Indies is another example of a cooperative institution trying to gain from scale almost in an engineering sense: Higher level graduates produced within each country would probably have been both costlier and of lower quality.

But there are scale issues – and attempted solutions – less resembling engineering considerations, rather addressing issues of political economy and incentives in small countries.

Take the issue of independent courts, and the view (Steve Shavell, 2002) that higher level courts serve to discipline lower level courts. The Caribbean court of justice hopefully can give the appeals court such a role at a level higher than the individual country, while bringing ownership closer than it could be with the Commonwealth's Privy Council.

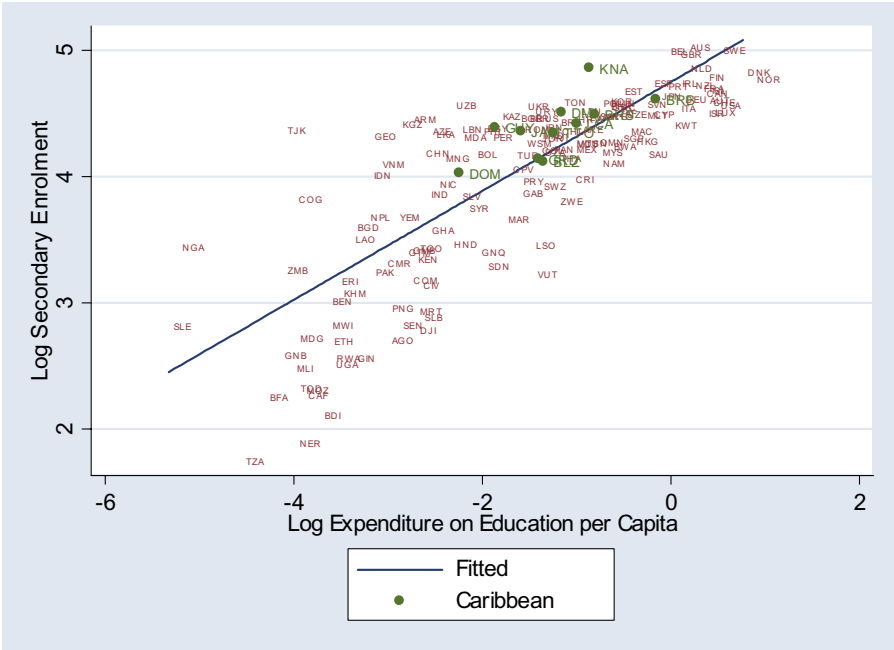
Educational systems, similarly, need to cope not only with scale issues such as the tension between school size and transportation costs, but also with political tensions such as that between the learning goals serving students and the sometimes opposing interests of employees and bureaucrats. One example of such tensions is that of standards for student testing: In a joint labor market, independent jurisdictions may be helped by a higher level authority setting standards for student testing, to prevent them from aiming for a low common denominator (Costrell, 1997). The Caribbean Examination Council should be able to serve the functions of raising standards and facilitating labor market integration (World Bank, 2002).

Finally, currency unions and free trade agreements may be helpful in serving goals of macroeconomic stability and efficient resource use where this might otherwise be pre-empted by domestic political forces. The Eastern Caribbean Currency Union, just as CFA zone in Africa and the Eurozone in the EU are institutional structures created to reap some of these benefits, but they also illustrate that these coordination roles are difficult to perform in practice.

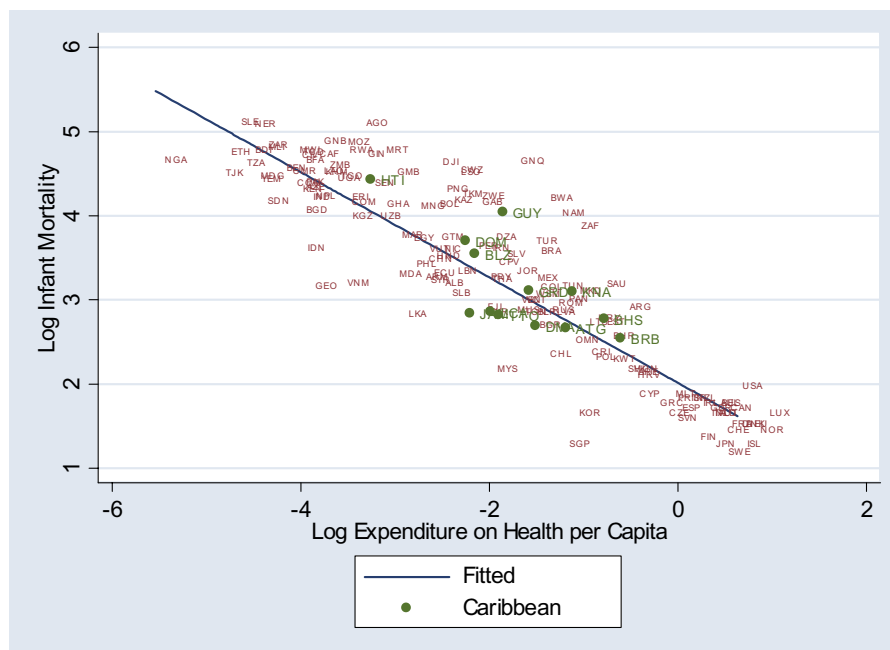
#### *A cautionary note on the role of government: expenditures are not all that matters*

We may initiate this section on two major areas of government expenditures – education and health - with two graphs that underscore a cautionary note. As we noted in this chapter's

introduction, an underlying goal of government is to enhance welfare and happiness, and amongst important aspects of welfare such indicators as education and health rank high on the agenda. That being said, it is generally incorrect to equate government expenditures with attainment of welfare, both in the general and in specific areas, such as education and health. Figure 1a and 1b displays simple cross sectional patterns between countries in these two areas and two plausible indicators of achievements: enrollment in secondary school and infant mortality rates. The figures makes but one simple point: expenditures and outcomes are correlated, but not very closely so. In fact, expenditures are quite closely related to income per capita, and income per capita quite typically proves more important as determinant – in a statistical sense – than does expenditures in areas such as national health and education achievements. This result is shown in annex table 7a, but is also a quite generally observed result in the literature. It should not be taken literally – to assume public expenditures are immaterial to health and education – but should still serve as a reminder not to overemphasize the role of expenditures as such, and also to focus on what it takes to improve the efficiency of public expenditure programs, etc. (Hanushek, 19xx).



**Figure 3.1a. An outcome measure such as secondary enrollment is correlated with public expenditures on education, but not significantly so in a multivariate cross country regression. The association is weak if at all present for the Caribbean countries.**



**Figure 3.1b. A health outcome measure such as infant mortality is correlated with public expenditures on education, but not significantly so in a multivariate cross country regression. The Caribbean countries are fairly representative in this bivariate relation.**

### *Analytical framework*

To approach the question of whether there are scale economies in important public expenditure areas, we might first notice how rarely this question is raised in the literature. This is quite puzzling, given that scale is at the heart of traditional textbook foundations for the role of government. The important exception to this neglect is the Tiebout literature (Tiebout, 1956) on local public goods: this literature is observant of the fact that competition between local jurisdictions for residents (and other mobile factors) can lead to efficient provision of public goods, suitably low taxes, etc.

There is also a recent literature on the size of nations, spearheaded by Alberto Alesina, noticing: a) that a value resting in the nation state traditionally is the uninterrupted trade in integrated markets (also noticed in the federalist papers, the US constitution, and in the foundation of GATT, WTO and EU); and b) that this value now extends beyond national borders, given institutions such as global and other trade agreements, developments which have coincided with the proliferation of states in the post world war II period (since 1945, the number of countries has more than doubled).<sup>6</sup>

There is also a relevance in the literature on fiscal decentralization (See, for instance, a review by Oates, *Journal of Economic Literature*, 199x), but this literature has in a puzzling fashion escaped the issue of scale. One exception is Panizza, 19xx, who finds that the size of a country – in terms of population – to be a positive and significant determinant of fiscal decentralization, in a descriptive sense.

<sup>6</sup> Braun, Hausmann and Pritchett (2002) examines the losses in terms of market size associated with the proliferation of states, and includes a particular focus on the Caribbean. They find newly independent states to do poorly, associate this with loss of market size, and find that the effects to be large (controlling for policy).

The countries of the Caribbean are all smaller than provinces and municipalities in larger countries. Cuba, Haiti and DR are not very small as countries, but they are smaller than subnational entities in countries such as Pakistan and the U.S.A. Nevertheless, it is worth bearing in mind that there is no general understanding in the literature of why those municipalities and provinces exist – or should exist – as subnational jurisdictions in countries, whether those countries are very centralized or exist as unitary states that are decentralized, or as loose federations.

Neither is there, for the Caribbean countries, much to refer to in terms of general principles as to whether they would be better served themselves by closer cooperation through treaties and shared functions. Perhaps the best illustration of this is reference to the Musgravian objectives (above):

- € The need for or possibility of *macroeconomic management* is not at all proven (re: the literature and actual disputes about optimal currency areas, as well as the questions of authority, raised in all such unions in practice);
- € *Redistribution in an interjurisdictional sense* would perhaps emerge as an objective or a demand over time, but would at any rate then test the cohesion in any form of collaborative arrangement;
- € But in the *allocative functions*, the question of course is on the relevant scale of operating government function.

The two first are mostly political question (though the literature on optimal currency areas connects questions of economic structure to monetary collaboration). It is thus in matters of allocation that scale economies – as through externalities – are most obviously important. As examples, most countries have the national government involved in nationwide trunk roads, as with the federal financing of interstate highway system in the US. Similarly, there is a more obvious role for national government in managing pollutants that travel far – such as sulphur – than in local air quality management. Using very parallel analogies for the Caribbean countries, they would probably develop a more suitable infrastructure for international transport under cooperation than they could individually. And if quality dimensions in tourism – as with environmental or other quality aspects – can spill over from one country to another by reputation or other channels, then a case can be made for jointly managing and marketing such quality dimensions.

For this reason, we emphasize, in the following, issues of scale in our examination of the role of government.

#### *A glance at size aspects of municipalities and provinces elsewhere*

As a preamble to the more sectorspecific analysis of scale issues in the Caribbean, we may exploit a data set on subnational governments in a data set of 107 countries<sup>7</sup>. One of the key argument for multi-level structures is that one can exploit scale economy and higher level coordination in some areas – where it is important – while preserving the benefits of smaller entities and proximity in areas where it is possible. For instance, one can have national defense but local schools, or one can have a national hospital with advanced services and a network of local clinics. Thus, if one thought of a large country as hypothetically consisting of smaller merged jurisdictions, then those smaller jurisdictions would cede some functions, some authority, some personnel to the higher entity, keeping others, and reduce costs or gain

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<sup>7</sup> World Bank, 1999. World Development Report, Marianne Fay, 1999.

services as a result. Combining this perspective with the observation of Panizza, 1999, that larger countries are more decentralized, points to the possibility that small countries fail to reap some of the benefits from centralization or coordination at a higher level.

If there was no such benefit, one could hypothesize a large country could be just a string of municipalities, with no national level structures or services. Figure 3.3 below plots the number of municipalities against population for a list of 107 countries. An expected observation that is evident (and also confirmed by statistical analysis) is that larger countries tend to have more municipalities. More interestingly, small countries tend to have many municipalities too, in the following sense: Small countries have *smaller* municipalities<sup>8</sup>. This can be read as indicating that the scale economies supporting higher level government relate not only to population but also to the number of municipalities.

**Figure 3.3: Population and Number of Municipalities, 1997.**



Municipalities within a country come in all sizes and shapes, much like countries do, in fact. The set of municipalities typically reflect phenomena such as urban concentrations, history and geography, joint purposes such as utilities (or even historic defenses, such as city walls).

For provinces (or other second tier governments in three-tier systems, such as states in the US, and Brazil), the picture is a little different. The graph is not shown here, but provinces come closer to proportionality with population, hinting at no scale economies in the number of provinces. Second, they tend to be more uniform in size (hinting that they have themselves been shaped by the higher level government phenomena, perhaps by administrative or political considerations). As an example, US states vary in population by a factor of 1 to 50, while municipalities easily vary by a factor of 1 to 1000.

More importantly, perhaps, is to apply the additional knowledge we all have, namely that higher level government structure can play dominant or minor roles, uniformly or selectively. It is quite general that municipalities and provinces play key roles in sectors such as health and education – owning and operating facilities – for instance. With respect to what role is played by higher level government in these sectors, however, in terms of authority and finance, for instance, the picture is much more varied.

<sup>8</sup> This is visualized by the positive constant in the graph: It seems a country would have several municipalities even if it had an unimaginably small population.

As importantly, in settings of sovereign nation states, transnational institutions for cooperation can be built in various ways, as with trade agreements (regional and global), banking regulations and monetary institutions (regional and global), environmental protection (sulphur in the North Eastern United States and in Europe, the Montreal protocol for protection of Earth's ozone layer), defense partnerships, etc. In Europe, an institution for free movement of goods has evolved into structures to ensure free movement of labour as well as common standards in many areas. Harmonized taxation is presently debated, though far from agreed.

The issue raised here is at the level of a country, but we should then bear in mind that several countries in the Caribbean are of a size comparable to school districts in other countries. The largest school district in the US has 1.1 million school aged children, many have only a handful: Alesina et al, 2004). The US school system is quite centralized within each state, (curriculum development, student test systems, teacher licensing, etc.<sup>9</sup>), but with only minor authority at the federal level. There is some federal involvement through finances, for instance, now with attempted linkages with student tests, etc. States in the US roughly have populations of 1 to 50 million, thus barely overlapping with the size range of countries in the Caribbean. That being said, the US school system produces a level of compatibility across states, in particular in graduating students that are mobile and acceptable across the federation, both within the education system (public and private) and within the labor market. Argentina, which decentralized its school system (first primary, then secondary) to provinces, retained certain powers with the federal government (a national testing system, for instance). These aspects may be worth noticing, in part because of the possibility that there are gains to coordination and collaboration that are not tied to any authoritative structure. The transnational cooperation observed in entities such as the University of the West Indies is a reflection of such recognition.

*Efficiency aspects: Scale issues in sectors such as education and health*

We here sketch a simple analytical framework for examining scale economies in a government activity, and the example chosen for need of a terminology is schooling. The issue raised is the following: Let  $y$  be schooling services of a given quality.  $Y$  can be quality as perceived by the child and its family, or as reflected in a given increase per year in human capital, resource availability per school year, test scores, etc.

There are scale economies to population in schooling if the unit cost of providing a service quality level  $y$  for a population  $n$ ,  $c(y,n)$  (or its children, actually) is declining in population  $n$ . In addition to this factor, however, as  $n$  rises, several potential effects will be operative:

- ∄ if and when unit costs are declining in  $n$ , the same level of service can be provided at a lower cost per capita;
- ∄ if and when costs of education are falling, then this might materialize in increased demand for education, as reflected in higher quality – or more years;
- ∄ but greater quality – or more years – also come at a cost, so this increased demand depends on the marginal cost of higher quality – or more years of education.

We shall be agnostic, here, about the process through which the education sector is governed. It would typically not be the case that individual families were confronted with the full marginal social costs to society of providing higher quality education. Neither is it natural to

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<sup>9</sup> States do, with some regularity, intervene – if necessary through the court system – in school districts. Similarly, the US supreme court has intervened in state school systems, at important junctures.

assume that parents are totally and directly in charge of schools at the local level: Typically there are channels of influence for parents locally, but there are also national political, bureaucratic and other structures mediating this influence, if not blocking it. More likely, the decisionmaking process is predominantly a collective one, where politicians on behalf of citizens take decisions about certain general parameters of the public part of the school system. Of course, parents and school employees could be amongst candidate groups to weigh in with their interests in such a process<sup>10</sup>.

A simple result on what happens to the quality (or number of years, or resources into service quality enhancement for each child) of schooling for the representative child if population grows and there are possible scale economies is:

$$(1) \quad \bullet_{y,n} \sum \frac{dy}{dn} \frac{n}{y} \Big| \frac{\kappa_{c,n}}{1/\kappa_{g,c} - 4 \kappa_{c,y}}.$$

$\bullet_{y,n}$  describes – on elasticity form – the resulting expansion of quality,  $y$ , combining demand side and supply side phenomena, as follows. First,  $\kappa_{c,n}$ , the elasticity of unit costs of  $y$  with respect to population, may be positive, zero or negative. If  $\kappa_{c,n}$  is zero, then nothing happens to schooling just because of changes in population. A solid assumption about school systems is that  $\kappa_{c,n}$  is zero simply because a country is large and schooling systems can be expanded at proportional costs simply because classrooms and teachers are added proportionally, as if the system is replicated. But a case for increasing marginal costs can also be made; if good teachers are in scarce supply, for instance, or if central functions such as the education ministry are essentially stretched. Finally, and perhaps most relevant for small countries, it may be that key fixed factors, whether in the ministry, in training teachers, can be better utilized for a larger population, giving rise to economies to scale. If there are economies to scale, it puts small countries at a disadvantage in the sense that it costs them more per capita to provide a given service level.

$\kappa_{g,c}$ , the elasticity of demand for  $y$ , schooling services per capita, with respect to per capita costs, is negative, and  $\kappa_{c,y}$  the elasticity of costs with respect to  $y$  is positive, so the denominator is negative.  $\kappa_{c,n}$ . The expression says, therefore, that demand for schooling services will increase with population if there are scale economies in schooling.

This increase in demand, though, is larger

- i) the greater is the tendency that unit costs fall with scale;
- ii) the smaller is the tendency that unit costs increase in service quality; and
- iii) the greater is the tendency that demand responds to costs.

A relevant question from the point of view of empirical analysis is whether this expansion in demand for service quality can be so large that total expenditures on education per capita increases. In ordinary demand analysis, this corresponds to the possibility of price-elastic demand: If the price elasticity of a commodity is greater in absolute value than one, then the demand increase following a price reduction is greater than the price reduction, so that consumption expands sufficiently to increase expenditure for that commodity.

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<sup>10</sup> Of course, given a political process in which not only tax resources and service levels are weighed against each other, but also rent for civil servants etc., the possibility exists that costs are not minimized for a given service quality. Rajagopal K.; Krishnaswamy N.R.; Madhavi Latha G.; Pritchett L.; Filmer D., 1999, Eskeland and Filmer (2002), Nikitin and Gradstein (2004) examines these issues.

The requirement for expenditures per capita to increase under scale economies and an increased population is:

$$(2) \quad \kappa_{g,c} (\kappa_{c,n} \geq \kappa_{c,y}) \geq 1$$

In the case of scale economies, the first two elasticities are negative, so the inequality can be satisfied only if the cost elasticity with respect to per capita consumption, which is positive, is smaller in absolute value than the cost elasticity with respect to population.

This is theoretically possible<sup>11</sup>.

It is thus a theoretical possibility that total expenditures per capita increase with population even if there are scale economies and the sector is run efficiently according to demand. We shall look into this question below, in part relying on institutional variables such as voice and accountability to establish a control for whether consumer and citizen interests are given weight in the governance of the education sector, and on variables such as trade openness to control for the underlying demand for education.

#### *Government expenditures in education and health*

Government spending on education among Caribbean states amounts on average to \$330 per capita (Annex table 1a, from IMF's GFS statistics). This is substantially higher than the Latin American average of \$270 per capita<sup>12</sup>. In relation to per capita income, the Caribbean average is 4.9 versus 4% for Latin America.

In health, Caribbean states spend \$220 per capita (3.3 percent of GDP) which is slightly higher than the LAC level of \$200, but lower than the LAC share in GDP (3.5%: Annex Table 3).

There is a strong positive relationship between public spending on education and national income per capita: richer countries spend more on education in per capita terms and as a share of national income. The estimated income elasticity of education spending (1.1, Annex table 1, and 4a) likely overestimates a true effect of income on spending – since possible reverse causality biases the estimate. As a descriptive proposition, however, across countries and for a country over time, spending on education is to a great extent determined by income per capita.

An interesting question is whether the levels of government expenditure and relevant outcomes in the Caribbean are indeed different from those of other developing countries (annex tables 4 a, b and e). Total government expenditures of Caribbean governments are significantly lower than that of other developing countries with the comparable level of income and population size (annex table 4e). In terms of education expenditure, the Caribbean spends as much as other developing countries, controlling for population size and GDP per capita (Annex table 4a). Health expenditure (whether expressed as a share of GDP

<sup>11</sup> We may add that an extreme maximum for the absolute value of  $\kappa_{c,n}$  may be 1, since a unit cost elasticity of minus one implies that there are only fixed costs: as if the nation is a classroom and pupils are added at zero cost. Similarly, an extreme minimum for the cost elasticity of  $y$ ,  $\kappa_{c,y}$ , should be zero, as if quality can be raised at zero costs. Taking these two extreme values for the cost elasticities, the demand elasticity with respect to costs,  $\kappa_{g,c}$  has to be at least one in absolute value for expenditures to increase despite scale economies when population increases.

<sup>12</sup> We use the term Latin America as does the World Bank, but excluding the Caribbean.

and in per capita terms) of Caribbean countries is significantly lower (4b), thus lending support to our earlier observation of disproportionately scarce public spending in health revealed by the means (according to WDI statistics).

Outcomes in education in Caribbean countries are not significantly deviating from expected levels, given government involvement in these areas. Primary and tertiary enrolment rates do not differ from those observed in patterns from other countries. Secondary enrolment, however, is significantly higher in the Caribbean (Table 4a).

In health, Caribbean economies do as expected of countries of comparable level of per capita income and population size (Table 4b). This could be considered surprising in light of the fact that public financing of the health sector is less generous than in other countries. Yet, as we have noted, there is more to health outcomes than public expenditures. Besides, in the Caribbean, there are comparatively high private expenditure on health, which may compensate for the scarce public funding (4b).

Considering changes in population and public spending over time will likely reveal a somewhat different picture. Such analysis point to the good performance of the Caribbean countries with regard to health and educational outcomes (table 5). In terms of infant mortality and mortality among children under 5, Caribbean countries are characterized by lower levels of mortality and faster improvements than the rest of the world. In terms of years of schooling, however, there has been a substantial convergence between the Caribbean countries and the rest of the world.

#### *Economies of Scale*

Figure 2a,b describe in a preliminary fashion the tendency that per capita public spending on education and health declines with population. The tendency seems particularly pronounced in the Caribbean (marked with red squares). An increase in population is associated with an 11% decline in per capita spending in the overall sample (controlling for regional effects); while the elasticity in the Caribbean is 20%. In the health sector, the situation is similar: a marginal increase in population is associated with a 13 percent decline in spending in the sample of all countries and with 28% decline in the Caribbean.

This picture is preliminary. A more thorough examination of the relationship between population size and public spending will introduce additional control variables. For now, suffice it to say that when we consider the levels of spending and population across countries, per capita cost of public schooling seems to decline in population. Referring to the analytical framework introduced above, this suggests economies of scale that are not – or not completely – consumed by (price-induced) demand increases for education services in larger countries (re equation 1, above).

Figure 3.4a

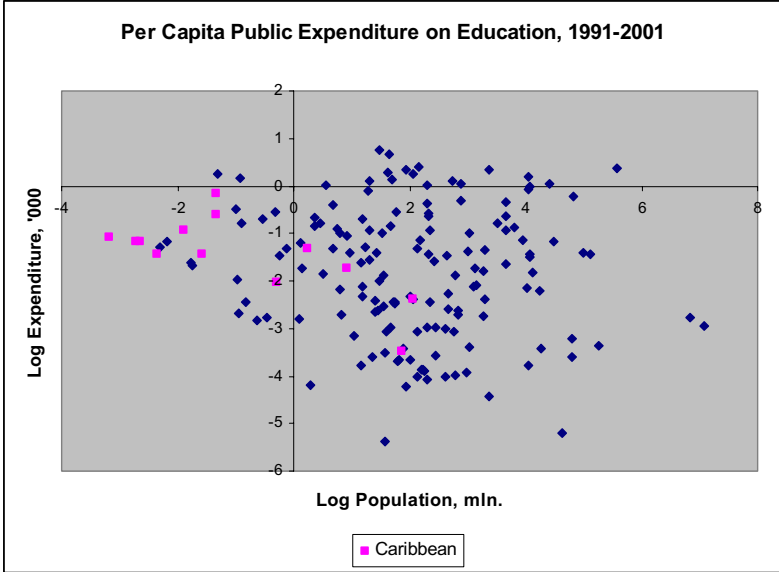
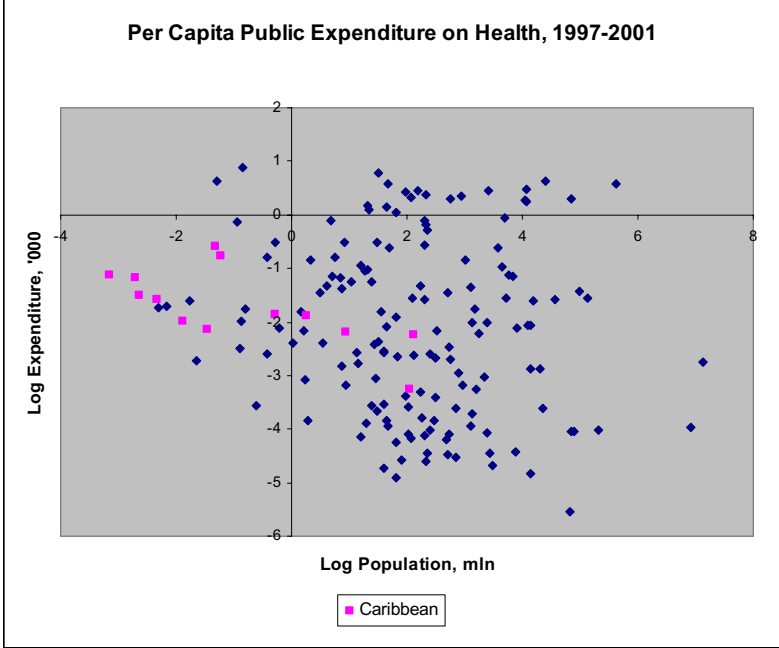


Figure 3.4b



Looking at the economies of scale, we distinguish between population size and geographical size, measured by a country's territory in square kilometers. Each of the two dimensions of scale may have unique costs and benefits. A higher population could reduce costs for the same land area (more densely populated areas allow a combination of greater classrooms and lower transportation costs – reducing costs per pupil), but the bivariate graphs here reflects the combined effect of these two variables. If geographical size increase faster or even proportionally to population increase, then transportation costs will increase as in Kenny's (1982) model of economies of scale in schooling.

We will consider the issue of economies of scale with a simple model in mind, according to which the decline in the cost of schooling due to economies of scale can be offset by and increase in demand for schooling, which will tend to drive expenditures up. We proxy for the

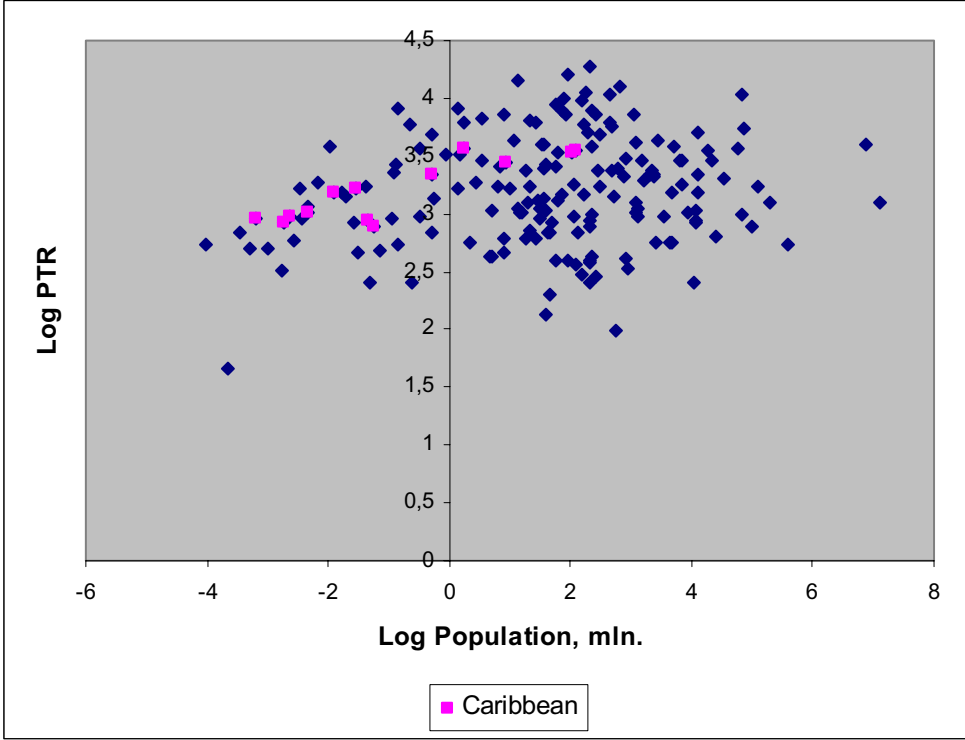
demand for schooling with openness. The latter is related to demand for schooling because it represents exposure to new technologies embedded in imports and the off-shore demand for skilled labor implicit in exports, both of which create incentives to invest in human capital.

We find presence of scale economies in schooling, in that population is negatively associated with education expenditure (elasticity  $-.04$ ) in a multivariate model in the full sample of countries (Annex table 8b). The smaller sample of Caribbean countries, however, fails to provide direct evidence of economies of scale in the Caribbean – the coefficient on population is of the right sign, but falls slightly below the lowest acceptable conventional threshold for significance ( $p$ -value $=.104$ : a table 8b). Thus, in the sample of Caribbean countries, while expenditure is negatively correlated with population (figure 6a), this correlations fails to be significant when controlling for factors such as income and openness.

Yet, as highlighted in our analytical framework, the fact that the coefficient on population is insignificant in some specifications in Tables 8a,b may conceal several opposite effects: downward effect on the price through scale economies may be offset by the expansion of demand for schooling, which could drive up expenditures per capita (more school years, more teacher hours, etc). In table 8d, we introduce secondary enrolment amongst the independent variables as a proxy for quality of education. Secondary enrolment is significant and with the expected sign, and the introduction increases the estimated scale elasticity, as indeed suggested by our analytical framework (equation 1).

Another way to approach this problem is to check for specific aspect of economies of scale. So we test for the presence of economies due to increased class size, which should be reflected in larger pupil-teacher ratio (PTR). Figure 3.5 indicates that PTR is slightly higher in countries with greater populations. This holds true both for the full sample and for the Caribbean states. In fact in the Caribbean the positive relationship would have been more pronounced we included Cuba. This observation, which is robust to inclusion of more variables in a statistical model, indicates that – for the Caribbean countries – the pattern of population densities is such greater population coincides with more pupils per teacher, which means that the larger countries benefit from scale economies at least in this engineering sense. Adding to this the perspective of our analytical framework, we may note that expenditure items other than the headcount of teachers must be higher for the more populous of the Caribbean countries, since they exploit scale economies in PTR but fail to display scale economies in total expenditures. This phenomenon could express higher demand – a possibility highlighted by our model – or other factors (such as, for instance, different political equilibrium between school employees, politicians, and families).

**Figure 3.5: Primary Pupil-Teacher Ratio Increases in Population**



Regressions testing the relationship between population and PTR more rigorously (see annex table 9) show that in the Caribbean population size is significantly and positively associated with PTR (both in logs<sup>13</sup>), with population elasticity of PTR around 11%. By contrast, in the overall sample, the number of students per teacher does not change significantly as population size changes (the coefficient, .01, is small and insignificant). We interpret this result as an indication that if there are indeed economies of scale in the full sample of countries, these economies of scale are not operating to any significant degree at the classroom level.<sup>14</sup> In the Caribbean, in contrast, we see scale economies at the classroom level. As figure 3.5 is hinting, it is plausible that this particular source of scale economy in school systems typically is exhausted at a fairly small population size<sup>15</sup>.

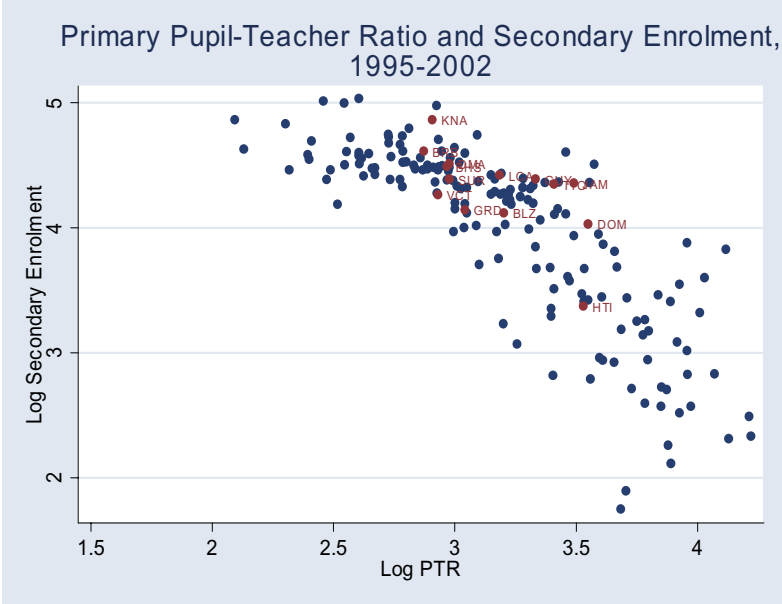
The fact that increased scale translates in a higher class size is a potentially important feature of the Caribbean countries, but we should be aware of complexities. It is possible that classroom expansion has a cost in terms of quality of schooling, and that the increase in other expenditures in Caribbean countries reflects efforts to have the best of both worlds – the cost reductions from classroom size, and the resource inputs to compensate with other inputs. It is beyond the scope of this study to answer these questions, the point here merely being to put the issue of scale on the table in a policy discussion.

In figure Figure 3.6 we pursue the question of quality of service. There is a negative relationship between primary PTR and secondary enrolment in the larger sample, and we have

<sup>13</sup> See appendix for regression without log transformation. The results are largely the same.  
<sup>14</sup> Perhaps there are economies of scale associated with a greater school size (as is the case in the US, for instance) or with curriculum, or something else, but not with class size so as to be reflected in PTR.  
<sup>15</sup> There is an observation in the schooling literature lending support to such a scale factor unrelated to crude PTR ratios. Large schools tend not to increase PTR but raises quality by greater freedom, for instance in subjects, or special needs.

examined this relationship further empirically (Annex table 10). The idea is that lower quality of instruction in the primary school will be reflected in the failure of the students to progress to secondary.

**Figure 3.6: Primary Pupil-Teacher Ratio and Secondary Enrolment.**



As indeed hinted in figure 4 find that increased *primary* PTR is associated with significantly lower *secondary* enrolment both in the world-wide and Caribbean samples. Even controlling for the level of income (because richer countries can be expected to have higher secondary enrolment and lower primary PTR), we observe that increased class size in the primary is negatively correlated with secondary enrolment in the full sample (elasticity -.46), but this effect is not seen in the Caribbean. Thus, in the full sample greater class size seems to coincide with lower quality of schooling (expressed in lower enrolment in secondary school). For the Caribbean countries, we have found some support for a pattern that higher costs of small size is compensated for by reduced complementary resource inputs. This can explain, that small size neither yields a great cost penalty nor an associated quality gain<sup>16</sup>.

Table 3.1 provides a brief summary of findings on scale economies in education, together with corresponding results for health expenditures.

<sup>16</sup> We should emphasize that there are alternative interpretations to these empirical patterns.

**Table 3.1: Expenditures on education and health: Elasticities with respect to population**

		Education	Health
Expenditures, declining in population?	Caribbean	-.04 **	-.09 *
	All country sample	-.11 not significant	-.06 ***
			Also for > 10 m sample
Inputs/person: declining in population?	Caribbean	Teacher: -.11 ***	Physicians: .2* Hosp. beds: -.1
	All country sample	-.1	Physicians: .1*** Hosp. beds: -.1 ***
		Also for < 10 m samples	Also for < 10m sample

*Scale Economies in Health Expenditure*

We address the issue of scale economies in the health sector in the way we dealt with scale economies in education. Annex Table 13 shows the statistically significant decline in per capita cost of public health care as population increases. The population elasticity of public spending is -.06 for the full sample and -.09 in the Caribbean), and statistically significant for both samples. Thus a fifty percent more populous Caribbean country spends 5% less on health in per capita terms.

We also analyse whether economies of scale – of which we found evidence in Table 13 – can be linked to the ratios of physicians and hospital beds per 1000 people (In Tables 14a and b). We find that the ratio of physicians to population tends to *increase* in population in the full sample and in all the subsamples (although the increase is not statistically significant in countries with populations over 10 million people). The number of physicians per 1000 people is analogous to the inverse of the pupil-teacher ratio for the education sector, though the role of the physician in the health sector is less dominant in the expenditure patterns (there are nurses and other workers, hospitals and other inputs, pharmaceuticals etc) than is the teacher in the education sector. The observation we made for the Caribbean countries in the education sector was that other cost items were expanding with scale so as to reduce the cost savings due to fewer teachers per capita. In the health sector, we find something similar: there are scale economies in spending at all levels, but these must be due to other factors than physicians, since physicians per capita are increasing with scale. To examine these via one avenue, there may be economies of scale at the level of hospitals. In fact, hospital beds per capita tends to decrease in population, as if a national hospital is not built proportionally smaller in a small country. In the full sample, the elasticity (-.1) is significant, but it is not significant in the Caribbean subsample (which could be due to the lower number of observations, of course). Thus, it appears that we, in hospital beds, find part of the origin of the scale economies that we failed to identify when examining the relationship between physicians and population.

*From expenditures patterns to outcomes*

As mentioned in the introduction and reflected in figures 2.1 and 2.2, the literature is fairly pessimistic (and perhaps disappointing) with respect to estimating statistical relationships between expenditure levels and outcomes in areas such as education and health. In the outset, one might hypothesize that if public spending in the Caribbean is indeed more productive (Caribbean countries spend less than what a model based on income and some other variables would indicate), statistical coefficients for outcomes related to spending should be higher in

the Caribbean than for the world as a whole. To avoid high collinearity between per capita income and health, public spending as a share of GDP is used. Results are reported in annex table 7a.

As the results in table 7a show, in the Caribbean public spending in education, health and infrastructure is not significantly correlated with corresponding outcomes. In fact, none of the variables introduced in these regressions can explain educational outcomes. In health, infant mortality and mortality of children under 5 decline significantly in income, but are unrelated to spending.

By contrast, in the full sample of countries, public spending as a share of GDP is significantly and positively associated with secondary and tertiary enrolment rates (table 7b). In health, similarly, public spending is significantly associated with lower mortality rates among infants and children under 5. We should highlight that there are no reasons to deduce from the difference between the full sample and the Caribbean subsample that expenditures in the Caribbean are more or less efficient than are expenditures on average for the greater sample of countries: These statistical relationships probably reveal little more than a reminder that the causal relationships behind health and education outcomes are complex phenomena. But they do remind us not to think of outcomes as directly related to increased spending, and consequently to think carefully about reforms that can enhance efficiency and quality of service<sup>17</sup>.

We also do some brief analysis of the third big productive enterprise of government: the provision of infrastructure services. The population elasticity of road network density is around 1.9, indicates that high elasticity of road infrastructure is a robust phenomenon. In the full sample regressions we control also for the possible specificities of advanced countries (essentially OECD members).

#### *Institutions and Public Spending*

As noted in the analytical framework and also in the above analysis which emphasized a supply side perspective on public expenditures, there are also factors of demand involved, and these are related to questions of how the sector is governed. We give these factors some attention in this section.

Caribbean countries show above average enrolment in secondary despite average levels of public spending in education. Similarly, their performance in health and certain areas of communications infrastructure development is somewhat higher than the levels of total government spending and health spending would lead one to expect. It may mean either that public spending is particularly productive in the Caribbean (say, due to institutional differences) or that public spending has little to do with spending the relative success of the Caribbean states in the above mentioned areas.

Needless to say: countries with different institutional arrangements may choose different levels of spending: this is exactly the motivation for assuming that – on a set of island countries – things are influenced by the islands being countries. Here we consider the association between public spending and *voice and accountability* a governance variable from the KKZ data set. *Voice and accountability* reflects how politicians are elected and ejected,

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<sup>17</sup> See Filmer and Pritchett, discussing the empirically weak (or nonexistent) links between inputs and outputs in education. They emphasize the need for models alternative to the cost-minimizing educational enterprise, focusing on interest groups bargaining for rent, political economy, etc.

but also other aspects of democratic and civil rights, such as freedom of speech and association. The variable thus is a suitable candidate to proxy for the ability of the general population to convey their interests and have them translated into action.

Caribbean countries outperform other countries at comparable level of income and population size in terms of *voice and accountability* (Table 4c).<sup>18</sup> As a rule, societies with greater voice and accountability tend to have higher levels of total public spending as well as higher expenditure on health and education<sup>19</sup>, thus reflecting the tendency of democratic governments to extend access to public services to broader strata of society. Given the positive relationship between public spending and voice, introduction of the voice variable into the previous models of expenditures should magnify the observed differences between the Caribbean and the overall trend, especially in public spending on health.

The role of a governance variable like *voice and accountability* in models of expenditures is illustrated in table 3.2, below. Effects of income are retained in these models, where also openness is included, representing demand effects as well as possibly other factors. Scale now retains its significance in the model for total and for health expenditures, but not for education. Both for education expenditures and for health expenditures, we can see that *voice and accountability* has the effect – perhaps expected – of raising expenditure levels. Interestingly, though, *voice and accountability* does not raise total expenditure levels, so it raises the share going to health and education. *Voice and accountability* is associated with increases in tax revenues as well, and thus seems to serve sound macro policy goals a fiscal setting in which deficits, inflation and debt levels definitely are worthy of attention. We may add that introduction of another governance variable, *rule of law*, essentially has very similar effects, and that the introduction of several governance variables seems to add few new insights if any.

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<sup>18</sup> Two other dimensions, *stability* and *control of corruption* come out as significantly higher for Caribbean countries if we do not use logged income per capita and population. We focus on *voice and accountability* here since the differences in voice prove to be most robust for the Caribbean. Note also that this makes Caribbean countries exceptional from the point of view of the literature which argues that small states (and Caribbean states tend to be small with populations mostly below 2 million inhabitants and no more than 10 million) are prone to elite capture, macroeconomic instability, and corruption, because these generalizations do not hold in the case of Caribbean nations.

<sup>19</sup> Correlations of voice and accountability with final government consumption, public education spending and public health spending are, respectively, .3, .42, and .63 (all significant).

<b>Table 3.2</b>	Gov-t final Expenditure, % GDP (log)	Tax Revenue, % GDP (log)	Public Education. Expenditure., %GDP (log)	Public Health Expenditures, %GDP (log)
Log Population	-0,059 [2.96]***	0,051 [1.37]	-0,02 [0.77]	-0,064 [2.96]***
Log GDP per Capita, '000	0,069 [1.86]*	-0,054 [0.73]	0,086 [1.76]*	0,202 [4.95]***
Advanced	0,138 [1.24]	0,143 [0.80]	-0,095 [0.65]	0,185 [1.53]
Caribbean	-0,209 [1.80]*	0,077 [0.28]	-0,102 [0.64]	-0,312 [2.48]**
<i>Voice and Accountability</i>	0,049 [1.06]	0,423 [4.81]***	0,167 [2.70]***	0,173 [3.47]***
Log Openness	0,132 [1.89]*	0,453 [3.57]***	0,03 [0.33]	-0,016 [0.21]
Constant	2,125 [6.74]***	0,76 [1.29]	1,171 [2.85]***	0,974 [2.83]***
Observations	160	119	155	159
R-squared	0,31	0,44	0,21	0,58

Absolute value of t statistics in brackets\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

#### **IV Promoting investment in small Caribbean states**

Creating a sound investment climate is vital for improving the economic performance of developing countries. It is a well established empirical regularity that economic growth is higher in countries that have higher investment rates (Levine and Renelt, 1992). Moreover, economic growth has been shown to reduce poverty, at least in the long run (Dollar and Kraay, 2002), though there is no doubt poverty reduction can be greater for some growth strategies than for others. Generating investment is thus an important factor in reducing poverty in developing countries, which underscores the need for identifying the key characteristics of a favourable investment climate.

The greater part of investment in developing countries is generated domestically, currently domestic investment (public and private) in developing countries totals about \$1 trillion (World Bank, 2003, p. xiv). By comparison, foreign direct investment (FDI) flows to developing countries are 15%, or \$160 billion. FDI flows have, however, been on a rapidly increasing trend in recent decades. Moreover, it is often argued that FDI can have a marked impact on productivity, by providing access to technological, managerial and organizational skills, or to other resources scarcely available in developing countries. Creating a favourable investment climate is therefore a matter of providing both domestic and foreign sources of capital with a suitable environment.

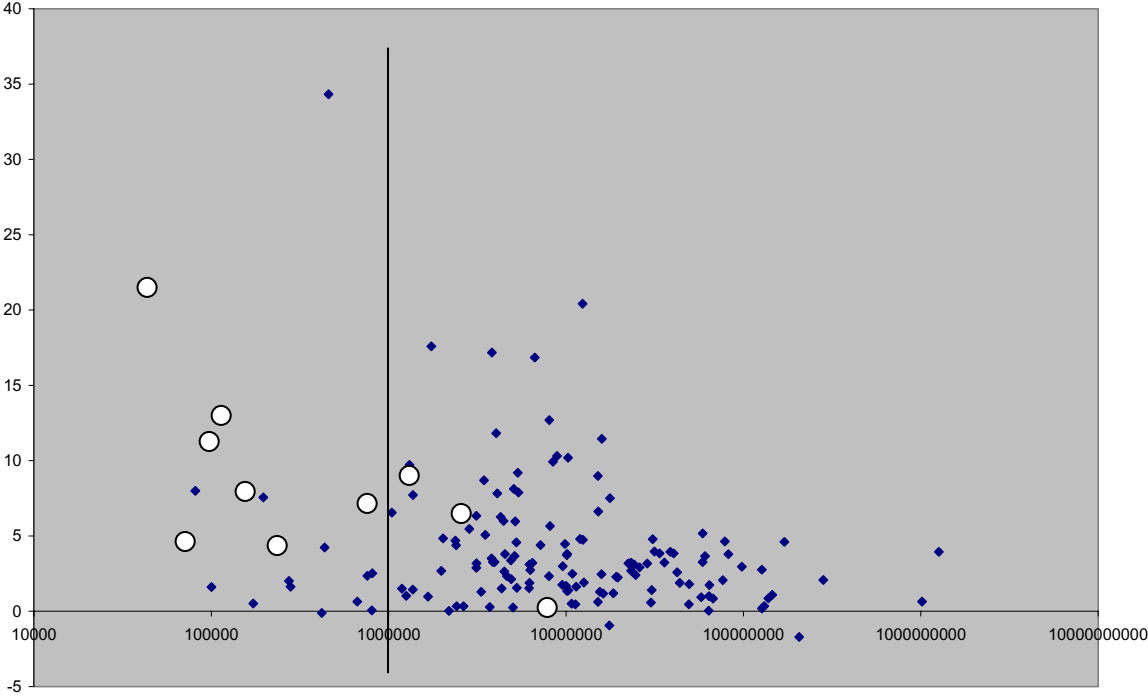
An overview of the literature on the determinants of domestic investment and FDI, reveals that there are similarities and differences in the factors that promote the two types of investment. For instance, Kolstad and Villanger (2004a) find that combating corruption increases domestic investment but has no effect on FDI, whereas political liberalization tends

to increase FDI but decrease domestic investment. Where the determinants of the two types of investment coincide or at least do not conflict, delineating a suitable investment regime is fairly straightforward, where they do not, there may be a greater need for judgment or reference to broad principles. Moreover, it is pertinent to point out that aggregate investment data only takes us so far in mapping the preconditions for investment. As revealed in Resmini (2000) and Kolstad and Villanger (2004b), determinants of FDI may differ significantly between industries, which implies that investment policy is sometimes a question of which industries you want to attract.

Easterly and Kraay (2000) find that small states do not have different rates of economic growth than larger states. They find, however, growth volatility of small states to be greater than that of larger states. Consequently, they argue that small states should open up to international capital movements to diversify risk, which certainly provides a case for improving the climate for FDI. The influence of smallness on investment, has not been exposed to a similar analysis. Some FDI studies do include population size as an explanatory variable. For example Choi (2003) finds population to be insignificant for FDI inflows. Similarly, several studies use regional dummy variables to capture differences between regions in generating investment. For instance, Asiedu (2002) finds that investment return, infrastructure and openness to trade have less of an impact on FDI in Sub-Saharan Africa than elsewhere. None of these studies seem to have used a dummy for the Caribbean countries, however. Against this backdrop, we take a closer look at the impact of smallness, and a Caribbean location, on domestic investment and FDI.

The below figure 4.1 presents FDI data for 152 countries, according to their population size. The score on the vertical axis is the FDI inflows as a percentage of GDP, averaged over the period 1998-2002. The score on the horizontal axis is population size, similarly averaged. There are 10 Caribbean countries for which data on FDI and population is available in the five-year period, and these observations have been circled. The figure appears to provide us with two initial suggestions. Firstly, if we follow Easterly and Kraay (2000) in letting 1 million inhabitants be the dividing line between small and large states, there does not appear to be any great difference between small and large states in their ability to attract foreign investment. Secondly, Caribbean states do not appear to be at a disadvantage in attracting FDI. In fact, most Caribbean states do better in terms of FDI inflows than countries comparable in size. And regardless of size, all the Caribbean states except Haiti have FDI inflows above the world average.

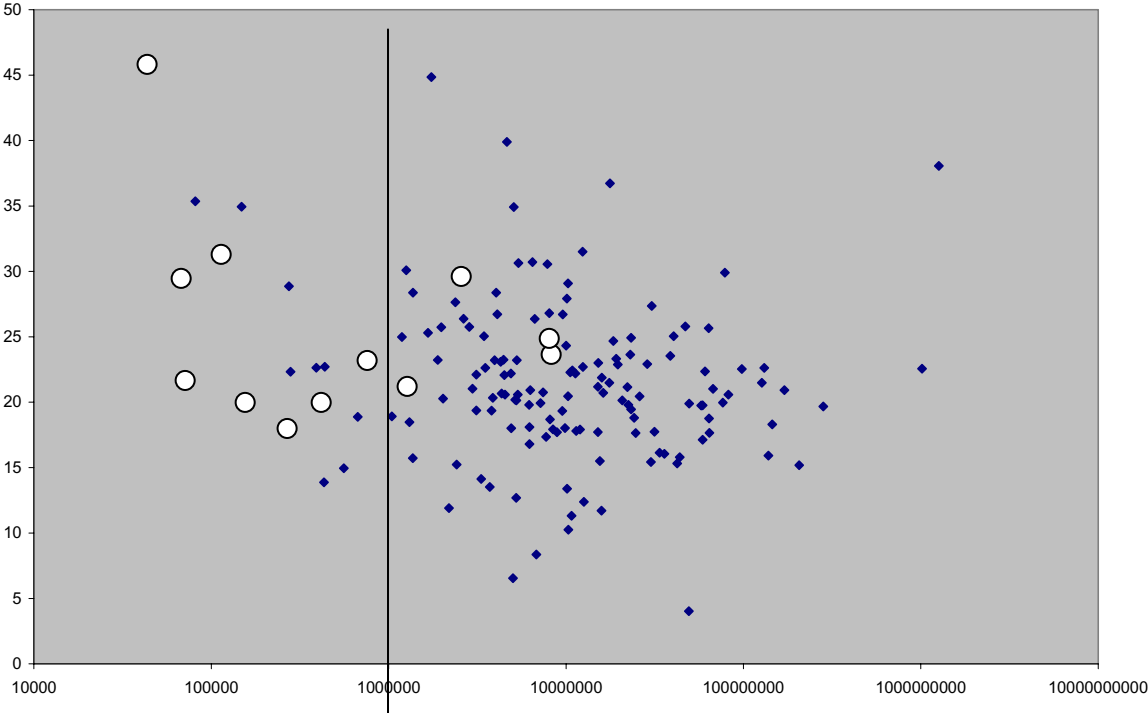
**Figure 4.1. FDI and population size**



Easterly and Kraay (2000) suggest that the fact that small countries do not have lower growth rates than larger, is due to their greater openness, which offsets any negative factors. A similar explanation might be given for the apparent indifference of foreign direct investment to country size. Openness has been shown to be a highly robust determinant of FDI (Chakrabarti, 2001, Kolstad and Villanger, 2004a). Moreover, as suggested by Alesina (2003), small countries often have more homogeneous populations, which might facilitate coordination in general, and particularly increase stability and reduce perceived investment risk. These factors might thus countervail any disadvantages of small states, such as a limited domestic market and other restrictions on the exploitation of economies of scale. As for the apparent attractiveness of Caribbean states to FDI, one explanation could be their proximity to major markets, another their suitability for tourism.

The following figure 4.2 provides a similar representation of domestic investment and population size for 156 countries. Gross domestic investment as a percentage of GDP is measured on the vertical axis, population on the horizontal, both averaged over the period 1998-2002. The 12 Caribbean states for which relevant data are available have been circled. An initial observation is that states with less than 1 million inhabitants do not seem to have different domestic investment than larger states. This observation is thus similar to the one made about FDI and population size. However, in terms of domestic investment, Caribbean states do neither better nor worse than other states. Of the 12 Caribbean states in the above figure, 7 have domestic investment rates above the world average. So there is no indication of a Caribbean-specific effect on domestic investment.

**Figure 4.2. Domestic investment and population size**



The above figures are merely suggestive, and the conclusions that can be drawn from them are limited. To get a better idea of whether and how size and a Caribbean location influences foreign direct and domestic investment, more rigorous econometric techniques must be employed. And though small states do not appear different in terms of the investment they generate, they might differ in the mechanisms through which they attract investment. In what follows, we will attempt to ascertain whether policies to attract investment have a different impact in small countries than in large, and in Caribbean states than in other states.

To motivate a focus on foreign and domestic investment, it is important to note their close relation to economic development in general, and economic growth in particular. We can conclude from the very thorough work of Barro et al. (2004) that there is a consensus that the following policy areas are important to growth. For given values of GDP per capita, economic growth increases in the amount of human capital, the investment ratio, the quality of the rule of law and openness to international markets. The factors that lead to reduced growth are high ratios of government consumption to GDP, high inflation rates and high fertility rates. Finally, it is found that favorable trends in terms of trade have a positive effect on growth. The below table captures the main conclusions from the empirical growth literature, and summarizes the results from additional analyses we did to revisit these main conclusions with a Caribbean perspective. As the table shows, our results confirm the importance of investment, both domestic and foreign, for economic growth. The role of inflation as a negative determinant of growth confirms the expected importance of sound macro and fiscal policies.

**Table 4.1. Summarizing the determinants of economic growth: The consensus in the literature and the results from our sample. + signifies a positive relationship, - signifies a negative relationship.**

	Barro et al. (2004)	Our sample
Convergence	Yes	Yes
Human capital	+	+**
Investment ratio	+	
-FDI		+
-gross domestic investment		+
Rule of law	+	+
International openness	+	*
Government consumption	-	Insignificant
Inflation	-	-
Fertility rate	-	n.a.
Terms of trade	+	n.a.
Population size	Insignificant	Insignificant
Caribbean dummy	n.a.	-

*\*We used the sum of export and import measured as the share of GDP. This turned up insignificant in a range of specifications, and also negative in some of these regressions.*

*\*\*Using the secondary school enrolment rate reduced our sample substantially.*

To establish the main constituents of a good investment environment, and to identify any Caribbean or small state idiosyncrasies, a thorough econometric study of foreign direct and domestic investment was conducted. The analyses of foreign direct investment were based on panel data for 135 countries over the period 1980-2002, wherein 13 Caribbean countries are included. Similarly, the domestic investment analyses drew on data from 145 countries over the period 1980-2002, 10 of which are Caribbean countries. A comparison of the results from the two sets of analyses, suggests that while there might be Caribbean-specific effects of certain variables on foreign direct investment, there do not appear to be any such effects in terms of domestic investment.

In the light of past studies, the results from our analyses of foreign and domestic investment provide the following policy advice to Caribbean policy makers seeking to increase investment in, and hence the growth perspectives of, their countries.

1. Investment, both foreign and domestic, is higher in countries that are open to international trade. Our results also suggest that Caribbean countries might see a greater effect of trade integration than other countries. Caribbean governments should therefore pursue regional trade arrangements, and actively support the WTO process of global trade liberalization.

2. Investment, both foreign and domestic, is higher in countries whose domestic markets are larger and more advanced. Regional integration to expand what is considered the domestic market, is thus beneficial.

3. Investment, both foreign and domestic, is higher in countries with greater political stability. To inspire confidence among investors, Caribbean countries should avoid political disruptions, by pursuing institutional strengthening, inclusive and participatory policies. Our results suggest that investment is particularly responsive to such developments in a group of countries that includes Haiti, Guyana, Dominica, and Grenada.

4. Foreign investors are discouraged by weak macro-economic policies, poor infrastructure, and excessive regulation. Caribbean countries should avoid periods of high inflation and large debt burdens, and develop functional infrastructure and regulatory frameworks.

These results are broadly in line with investor perception studies conducted on Caribbean investors. On such study of foreign investors, suggest that infrastructure is a salient factor for investors, which mirrors our result on infrastructure and FDI. The study further holds that while market access is not important for investors in industry, it is highly important for investors in the service sector. Since our analysis is based on data aggregated across industries, where service sector FDI has risen to be the dominant component, these results are largely consistent with ours. Finally, the study of investor perceptions suggests that labour market issues are of some importance, which we were unable to test in our analyses due to data limitations. That observation, however, lends increased relevance to our emphasis in section III on the education sector.

The general advice given above is based on analyses of the factors that move total investment flows. As noted earlier, investment in specific industries can be driven by different factors. Given the fact that FDI in the service industries accounts for more than 60% of total FDI flows, focusing on these industries is particularly relevant.

Kolstad and Villanger (2004c) conduct an analysis of the factors that determine FDI in services as a whole, and in four individual service industries (finance, business, transport, and trade). One finding in that study is that while domestic market size influences FDI in services as a whole, and in each of the four industries, trade openness is insignificant across the board. For a country seeking to attract FDI in services, the implication could be that investments in those service sectors may not require a particular emphasis on trade integration. The study further finds that FDI in certain producer service industries (finance and transport) depends on there being a foreign manufacturing base in the host country. Finally, though socio-political variables do not influence FDI as a whole, the institutional environment affects investment in certain sectors, particularly transport. Other service industries important for Caribbean countries, such as tourism and health services, are not analysed by the study. More research is therefore needed to determine how Caribbean countries can promote an expansion of these industries.

## **V: Governance and institutional issues**

We shall examine governance and institutional issues through the lens of the governance variables provided by Kraay, Kaufmann and Zoido-Lobaton. In figure 5.1, we plot two of these, *voice and accountability* and *rule of law* for the Caribbean countries. The variables are constructed to have – for the sample of all countries (about 175) a mean of zero, a standard deviation of one, and to be signed such that ‘more is better’. *Voice and accountability* is much

about a democratic system of government, election of officials, free speech, while *rule of law* is more about the extent to which government upholds the law and is itself bound by law.

These two governance variables – out of six – may perhaps be seen to represent two ends on a spectrum of governance, and – if one accepts this view – as suitable complements. *Voice and accountability* relates to citizens rights and the election of officials. Thus, the variable clearly represents a notion of democratic ideals and function. Simultaneously, though, *voice and accountability* may carry the potential for government action to make turns, perhaps in opportunistic and surprising ways: this would certainly depend not only on democracy itself but on the context in which it operates (Plato has a nice discussion, insightful to this day)<sup>20</sup>. *Rule of law*, in contrast, represents what the framers of the US constitution have called ‘checks and balances’ and ‘separation of powers’. Indeed, with an increasingly independent judiciary, and separation between the executive and the legislature, limits are placed on the turns and and bends available to political leaders. One could speculate, thus, that these two variables play different roles in facilitating development, and that the great challenge in institutional strengthening is to do well in terms of both.<sup>21</sup>

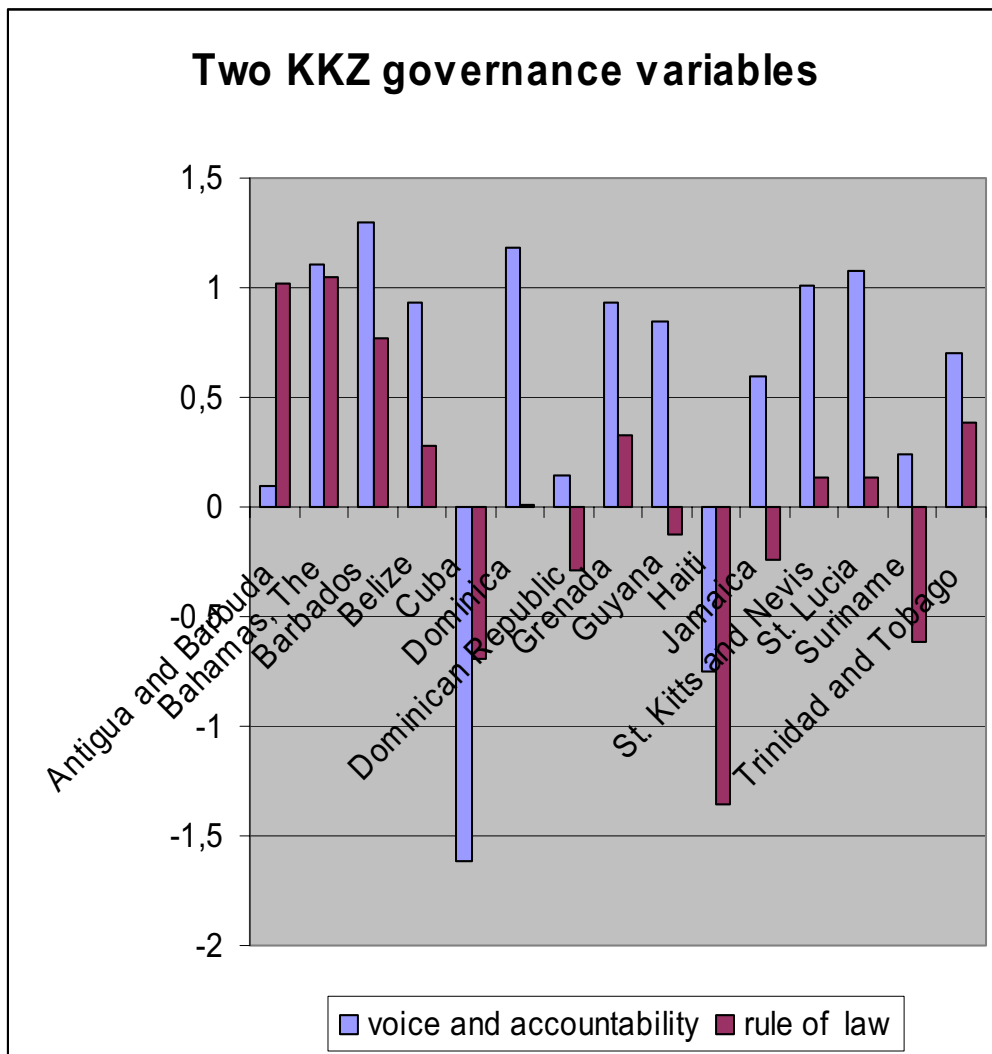
As we can see in figure 5.1, the Caribbean countries quite generally do better in terms of *voice and accountability* than in terms of *rule of law*. The exceptions to this rule are Antigua and Barbuda – a country that does fairly well on the average of these two variables, and Cuba, a country that does very badly, but particularly in terms of voice and accountability<sup>22</sup>. Another outlier in this graph doing poorly on both is Haiti, but Haiti follows the general pattern in the Caribbean of doing better in terms of voice and accountability than in terms of rule of law. Haiti’s low record on *law* reminds us that the indicator not only measures the finer nuances of constraints on government, but also on whether government can be relied upon to protect citizens and their property against ordinary crime and violence. This cruder and more basic aspect of the rule of law is of course no less essential to investors, but is fundamentally threatening to ordinary citizens and the poor, in terms of their ability to take part in a market economy with their time and their savings.

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<sup>20</sup> Mancur Olson (Autocracy and democratic rule) analyses whether autocracies are more stable in the sense of respecting property and being bound by law (so as not to expropriate wealth, by surprise inflation, for instance). He concludes that in the long run, democracies have more of this stability quality, since the institutions of democracy can have greater durability than the qualities of individual rulers.

<sup>21</sup> The OECS institutional and governance review (World Bank, Jit Gil) finds that the three branches of government often are very close in the OECS states, rendering ‘rule of law’ (in the sense of checks and balances, independence) a weak spot in their institutional machinery.

<sup>22</sup> Due to the focus of the report and also the lack of data, Cuba generally commands little attention in this analysis. There are well-known arguments that Cuba does well in important welfare dimensions such as health and education relative to its performance on indicators such as – in international comparisons – income and democratic governance. Related to this, one may argue that these comparators are poorly suited for samples including countries such as Cuba.



**Figure 5.1: Caribbean countries do better on governance indicators such as *voice and accountability* than on those measuring constraints on government, such as *rule of law*.**

There is an important conceptual and empirical issue in the literature whether causal effects run from institutional variables such as these into desirable welfare goals such as income growth (Mauro, 1995, is an important early contribution to this empirical literature, as is Fizbein and Gatti, 1999). Suffice it to say here we shall accept the generally held view that *some* causal effects run in that direction (there are of course also some causal effects in the opposite direction: one can better afford a good police force and judicial system and independent judges after a good harvest).

More importantly, perhaps, is the question of whether one can view the governance variables as available policy instruments. The possibility exists, of course, that some institutional advances come more easily in some situations than in others. It does appear, for instance, that countries with small populations come more easily to *voice and accountability* than to rule of law (table 5.1). The following table summarizes statistical relationships that ‘predict’ the six KKZ institutional variables, as well as two others:

**Table 5.1: Descriptive patterns in governance variables: 126 to 165 countries (see annex table 1)**

	Voice and Accountability	Political Stability	Government Effectiveness	Quality of Regulation	Rule of Law	Control of Corruption	ICRG	CPIA
Log GDP per Capita	+++	+++	+++	+++	+++	+++	+++	+++
Log Population	---	---				---		
Advanced Caribbean	+++	+++	+++	+++	+++	+++	+++	
R-squared	0,6	0,58	0,76	0,61	0,78	0,78	0,77	0,3

Pluses and minuses: 1: significant at 10%; 2 significant at 5%; 3 significant at 1%. Data source: World Bank, KKZ 1999-2002.

Table 5.1 Countries with small populations do consistently better on three governance variables, and Caribbean countries do significantly better, as a group, on *voice and accountability*, one of these.

### **Box 5.1: Population size and institutions: Several conflicting ideas**

The question of scale and governance institutions is complicated. But if institutions – *rules and organizations* – are structures facilitating coordination, it would be strange if they had no relationship to the scale, as with the population size of municipalities and countries.

One strong idea is that democracy can be more direct and effective at the local level than in a large jurisdiction (an example is Seabright, 199x). This idea is different from Tiebout's 1956 proposition that 'voting by feet' – or migration – between small jurisdictions can keep government effective through competition. But it is similar to the idea that in enterprises the use of ideas from all is easier in firms that are either small or decentralized. Seen in this light, one might not be surprised that small countries, and Caribbean ones amongst them, perform comparatively well for some institutional variables, and that 'voice and accountability' is amongst them.

But there are important opposing ideas. In the 'federalist papers' – important in framing the US constitution – there is a belief that the quality of government will be higher at higher levels. An argument used in the federalist papers is that government officials in larger jurisdictions will be drawn from a larger pool of candidates, potentially drawing better candidates.

And there are others, of course. Appeal courts may raise quality of courts at lower levels (Shavell). Similarly, higher level institutions may be essential to increase transparency and reduce abuses in small towns. In the US, it is the Federal Bureau of Investigation that acts against corrupt practices even at state and local levels, and federal courts have acted against discrimination both in state education systems and in labor relations. Both in the EU and in the Caribbean one can see transnational institutions for monetary policy to raise one a desirable institutional quality – independence. And in Europe as well as the Caribbean, transnational higher courts and regulations aim at improving the rule of law (another important institutional variable), the quality of regulation, and effective competition.

It is not hard to see that institutional quality can be enhanced by scale. Adherence to the rule of law, for instance, is a commitment to principle. For a jurisdiction's overall well-being, such commitment is rewarded through future transactions (for instance through improved investment climate). In a small jurisdiction, if a bribe is offered in a present-day transaction, the incentive to uphold law is reduced by the small size and infrequency of those future transactions.

There may real tradeoffs. It may be, for instance, that transnational institutions attain certain qualities but at a cost of making democracy less direct. This is certainly one of the fears voiced within the anti-globalization movement, and it is an important discussion as EU expands in ambition. Alesina et al. argues that the problem of less direct democracy is worth attention when transnational institutions expands through multiple, overlapping treaties.

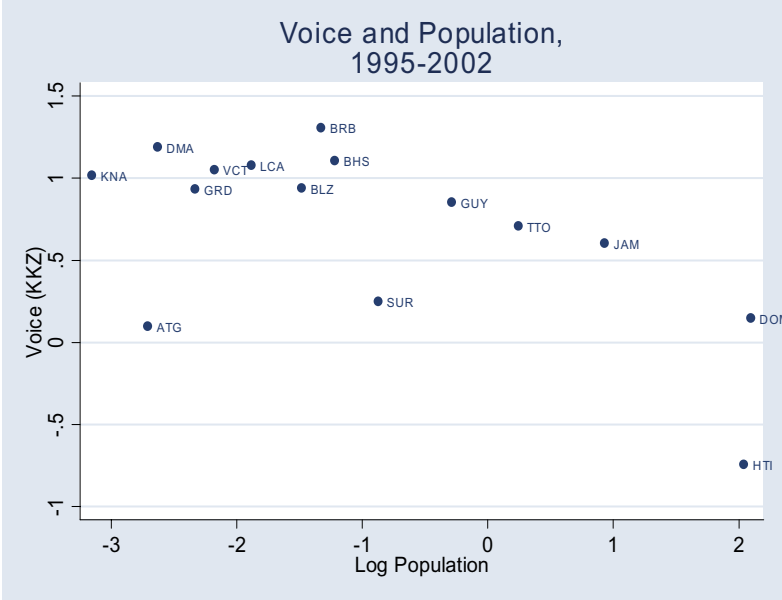
Table 5.1 shows that all the governance variables are strongly associated with income per capita (in logarithms), while three: *voice*, *stability* and *control of corruption*, are strongly and negatively associated with country size, in terms of population (in logarithms). This latter relationship has to our knowledge not earlier been recognized in the literature<sup>23</sup>. That it is of potential relevance to the Caribbean countries is emphasized by the fact that a dummy variable for the Caribbean countries is positive and significant for voice and accountability only when the scale effect from population is already accounted for.

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<sup>23</sup> Knack and Azfar, 2000 (WB policy research working paper), holds that a pattern that larger countries are more corrupt reflects sample selection bias. Our sample here is richer (data set has grown), and we show here that small countries must likely fight harder to attain those governance dimensions that come easily to large countries.

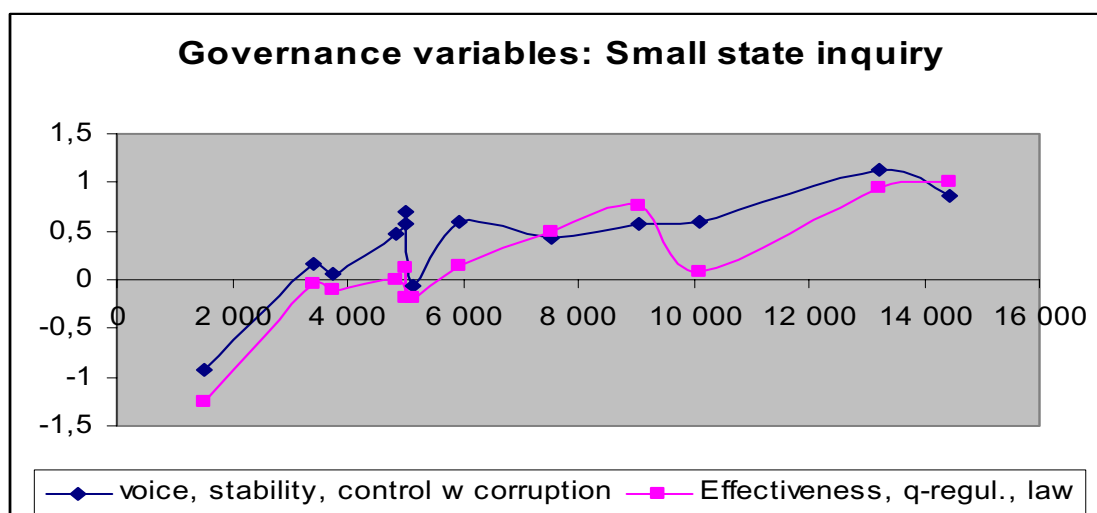
In figure 5.2, we show that for the voice and accountability variable, there is a pattern according to population even amongst the Caribbean countries, a pattern much more pronounced if Cuba were included (to the lower right of Haiti).

**Figure 5.2: Voice and accountability plotted against population of Caribbean countries.**



In figure 5.3, we take advantage of the separation provided by table 5.1 into three variables that are associated with population size and three that are not, and we create one variable from each group of three. The graph illustrates an expected tendency for Caribbean countries (given that they are all small in terms of population), namely that they score higher in terms of the scale dependent variable (voice, stability, control of corruption) than in terms of effectiveness, quality of regulation, rule of law. These observations certainly are indicative that small countries can come with some ease to institutional qualities such as *voice and accountability*, *stability* and *control of corruption*, whereas there may be other, more systemic investments and developments involved in building quality regulation, government effectiveness, and rule of law, and that these latter qualities just as easily – or more easily – are acquired by larger countries<sup>24</sup>.

<sup>24</sup> Plausible models exist in which ‘checks and balances’ – or judicial independence for instance - has payoffs dependent on scale. Consider, for instance, a confrontation between a judge and a politician caught stealing. Even for society, there may be a tradeoff between the short term gains of ‘greasing the wheels’ (smoothing things over, sharing the spoils, looking ahead) and the long term benefits of using real prisons and real time to improve incentives and thereby behavior. If so, the payoffs to doing the right thing (encarceration, with the shouting, crying and sacrifices involved) could be insufficient if the incentive effects shall improve behavior only in a small country of three nearby towns, but sufficient if the country is a large one with two cities and six towns improving, for the same sacrifice of a single cell and a single bribe forsaken. Such a structure, of course, lends support in principle to structures such as the Caribbean supreme court system, the Privy council of the Commonwealth, shared regulatory authorities such as the Caribbean telecoms authority, and perhaps also to entities without authoritative powers – still in need of independence – such as the OECS Environmentally Sustainable Development Unit (a professional service provider) and the University of the West Indies.



**Figure 5.3: Caribbean countries do systematically better for the governance variables that are size dependent than for those that are not.**

### VI: Summary, and remarks on a broader context

In important areas of this chapter, other studies exist with access to more detail and specifics. Here, nevertheless, we have emphasized particular aspects that are both policy relevant and require new analysis. The basic observations motivating the analysis were:

- ∄ Caribbean countries need to find a policy basis for renewal, in particular to see healthy private sector growth, when traditional agriculture (banana, sugar) show little promise (in the face of declining privileges), and tourism – while promising, show uncertain prospects;
- ∄ Government may seem to have exhausted its possibilities, and is in need of new direction and reform options;
- ∄ Regional cooperation is considered a promising area, both for trade integration, labor market integration and private sector developments, and for ways to improve quality and effectiveness in government functions.

The analysis basically found that scale effects exists in three important areas considered (government expenditure programs, investment climate, and governance institutions) all laying out empirical arguments that important strategic options *may* lie in increased regional cooperation:

- ∄ In the area of institutions and governance, likely as important on a small scale as on a large scale, observed scale effects may reflect that the political economy can be an obstacle to improvements in small countries. Governance dimensions of independence, or checks and balances, may require scale to develop further, perhaps offering a reward to regional cooperation. These dimensions include three of the six KKZ variables, namely *regulatory quality*, *rule of law*, and *government effectiveness*. The three others, *control of corruption*, *political stability*, and *voice and accountability* seem to come more easily to small countries, and the Caribbean countries do particularly well on the latter. An important issue remains as a major challenge in the development of this agenda, however, and it is well illustrated by the notion of a ‘democratic deficit’ in the EU: Does the development of transnational institutions offer a ‘best of both worlds’, where the benefits of commitment and scale can be had, without the loss of democratic control and accountability?
- ∄ In the areas of major government expenditure programs, notably education and health, Caribbean countries lay down much of their public resources, and there is ample evidence that their small size of operation is costly to them. While one should not take

attention away from other approaches to these sectors (increased private sector role, corporatization, greater accountability within the public sector, civil service reform, outsourcing, etc), this does provide some evidence that there are gains to cooperation and shared functions across countries in the region. Combining these supply side considerations with benefits of a shared pool of qualified workers, including in terms of greater regional specialization and integration in business, further strengthens the potential in these arguments. Finally, the notion that the region can have a future as an international service provider in areas of education and health likely would also require joint approaches to service production, in terms of training, regulation, licensing, supervision, etc.

An area not examined here, in part because of its empirical complexity, is infrastructure. Infrastructure regularly shows up amongst investors' concerns in the Caribbean countries, pointing towards the needs for professionalism, not the least in key government functions such as regulation, investment analysis and pricing. Infrastructure is an area fraught with real scale issues, including some that are not resolved by alternative institutional arrangements such as through regional cooperation. It is obvious, for instance, that the tree structure giving rise to scale economies (in roads and rail, for instance) lies behind the low levels of transport infrastructure in the Caribbean. Main trunk roads do not make the same sense in a small land-mass as in a larger one, and this again limits the economy in the finer road networks. Finally, sea freight, and air, important and economic anywhere where it is feasible, also is less economic and less useful in contexts where payload volumes effectively constrains the size of vessels and their frequency of operation.

Findings on what is important for investors in other areas are – for the most part – not very different from solid and logical evidence found elsewhere (see section IV, above). Nevertheless, a challenge particular to Caribbean in terms of strengthening the investment climate is excessive competition for investors. Such a situation easily destroys the discipline authorities need to break out of a myopic mode of tax and regulatory concessions. An area suitable to illustrate this is investments in tourism, important to Caribbean countries in the past and hopefully in the future. Caribbean countries quite consistently fail to collect taxes in the sector, often allow developments jeopardizing environmental quality and thus their very same development prospects<sup>25</sup>. Greater coordination between countries in areas such as these could allow not only for strength in professionalism – greatly needed – but also in the sense of commitment and being able to take a strategic and long term perspective. Credibility behind such an approach could be welcome also to business interests, likely willing to take a longer view if government institutions deliver a business climate can support it<sup>26</sup>.

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<sup>25</sup> There is probably both prejudice and insight in the words of one Caribbean civil servant: 'The tourism sector is the sector that has been aroused, fondling and kissing for generations, but which never grew up. It never got married, held a steady job, built for the long term, paid taxes, raised kids. It is forever promising, fresh and delightfully excited, forwardlooking. It needs help to get started, another tax break, another exemption. It is a good employer and never paid anyone a decent salary. It is the kid who asks you, again, for the car keys, and then changes plans if you ask her to fill up the gas tank.'

<sup>26</sup> There is very little literature examining the benefits of coordination, but there is reference to the damaging effects of excessive competition and inadequate cooperation. Two important references are Konrad and Schjelderup, 1999 (with conditions for tax-cooperation to be Pareto-improving), and Razin and Sadka, 2004.

## Annex table 1:

Economies of Scale in Expenditure on Education. OLS, 1995-2002  
Averages.

	All	Caribbean	LAC	<=3 mln.	<=10 mln	>10 mln.
	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita
Log GDP per Capita	1.109 [22.94]***	0.675 [2.91]**	0.948 [6.98]***	0.939 [9.37]***	1.058 [17.01]***	1.267 [13.99]***
Log Population	-0.041 [2.08]**	-0.124 [1.81]	-0.059 [2.04]*	0.019 [0.27]	-0.066 [1.74]*	-0.04 [0.75]
ECA	-0.024 [0.16]			0.077 [0.19]	-0.238 [1.12]	0.324 [1.50]
MENA	0.001 [0.01]			-0.212 [0.59]	-0.264 [1.31]	0.544 [2.14]**
SSA	-0.175 [0.99]			-0.184 [0.46]	-0.421 [1.79]*	0.386 [1.27]
SAR	-0.26 [1.07]			0 [.]	0 [.]	0.183 [0.57]
LAC	-0.145 [1.00]			0.028 [0.08]	-0.302 [1.46]	0.029 [0.13]
EAP	-0.257 [1.64]			-0.012 [0.03]	-0.398 [1.75]*	0.003 [0.01]
Constant	-3.215 [16.78]***	-2.644 [6.23]***	-3.069 [12.42]***	-2.9 [6.36]***	-2.953 [11.43]***	-3.748 [10.73]***
Observations	159	12	28	45	92	67
R-squared	0.91	0.67	0.71	0.82	0.91	0.93

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 1a**

Government Expenditure and Outcomes, 1995-2002.

	<i>All Countries</i>		<i>LAC</i>		<i>Caribbean*</i>		<i>LAC w/o Caribbean*</i>	
	Mean	N	Mean	N	Mean	N	Mean	N
<i>Overall</i>								
Final consumption expenditure of general government per capita, '000	1,35	161	0,85	30	1,10	13	0,67	17
Final consumption expenditure of general government, % GDP	16,23	172	14,27	30	17,89	14	12,90	18
<i>Education</i>								
Public expenditure on education per capita, 000	0,37	159	0,27	28	0,33	13	0,21	15
Public expenditure on education, % GDP ^	4,45	169	4,29	28	4,88	13	4,01	17
Primary enrolment	98,02	187	109,05	35	106,64	14	110,66	21
Secondary Enrolment	65,58	188	70,39	35	77,55	14	65,61	21
Tertiary enrolment	21,02	180	20,46	31	14,76	10	23,17	21
Pupil-teacher ratio	27,09	185	24,42	36	24,18	15	24,59	21
<i>Health</i>								
Public expenditure on health per capita, 000	0,35	163	0,21	31	0,22	14	0,20	17
Public expenditure on health, % GDP ^	3,43	186	3,30	31	3,33	15	3,55	18
Private expenditure on health per capita, 000	0,17	162	0,17	31	0,15	14	0,19	17
Share of public expenditure in total expenditure on health	59,80	187	56,62	33	59,50	15	54,23	18
Infant mortality	46,08	189	27,78	33	27,89	15	27,69	18
Mortality among children under 5	66,70	189	34,69	33	35,69	15	33,85	18
Life expectancy	65,54	197	71,10	36	70,54	15	71,50	21
Hospital beds per 1000 people	5,02	122	3,33	36	3,60	15	3,14	21
Physicians per 1000 people	1,46	181	1,28	38	0,81	15	1,59	23
<i>Infrastructure</i>								
Road network density (km/hectar)	68,68	182	48,05	34	0,02	15	85,97	19
Paved roads, % total network	49,60	180	35,15	33	42,69	14	29,60	19
Phone mainlines per 1000	203,39	205	209,41	38	238,58	15	190,39	23
Improved water source, per 1000	79,07	149	88,34	32	90,07	15	86,82	17
Improved sanitation facilities per 1000	73,63	142	84,38	32	85,27	15	83,59	17
<i>Governance</i>								
Voice	0,02	199	0,40	37	0,70	15	0,70	15
Stability	0,05	186	0,12	34	0,29	12	0,29	12
Effectiveness	0,02	195	0,03	37	-0,01	15	-0,01	15
Regulation	0,01	195	0,34	37	0,17	15	0,17	15
Rule of Law	0,03	195	0,04	37	0,12	15	0,12	15
Corruption	0,02	195	0,03	37	0,12	15	0,12	15
ICRG	68,10	141	66,76	25	67,71	7	67,71	7
CPIA	3,47	136	3,66	28	3,54	11	3,54	11

Source: WDI.

\* Caribbean countries include CARICOM members (except Monserrat) and Dominican Republic.

**Table 2**

Government Expenditure in Caribbean states, 1995-2002.

Country	Code	Final consumption expenditure of general government per capita, '000	Final consumption expenditure of general government, % GDP	Public expenditure on education per capita, '000	Public expenditure on education, % GDP	Public expenditure on health per capita, '000	Public expenditure on health, % GDP
Antigua and Barbuda	ATG	2,06	22,65	0,31	3,24	0,31	3,30
Bahamas, The	BHS	.	.	0,45	3,18	0,46	3,14
Belize	BLZ	0,79	16,80	0,26	5,52	0,12	2,42
Barbados	BRB	2,86	21,67	0,86	6,23	0,55	4,04
Dominica	DMA	1,06	21,28	0,31	6,12	0,22	4,34
Dominican Republic	DOM	0,40	7,71	0,11	2,17	0,11	1,98
Grenada	GRD	0,95	16,05	0,25	4,47	0,21	3,36
Guyana	GUY	0,76	20,20	0,16	4,26	0,16	4,12
Haiti	HTI	0,11	7,24	.	.	0,04	2,56
Jamaica	JAM	0,56	16,40	0,21	6,02	0,11	3,28
St. Kitts and Nevis	KNA	2,03	20,07	0,42	4,21	0,33	3,16
St. Lucia	LCA	0,78	15,50	0,37	7,18	0,14	2,74
Suriname	SUR	.	30,77	.	.	.	5,80
Trinidad and Tobago	TTO	0,83	11,06	0,29	3,75	0,15	1,96
St. Vincent and the Grenadines	VCT	1,06	23,06	0,34	7,04	0,18	3,82
Total		1,10	17,89	0,33	4,88	0,22	3,33

Source: WDI.

Table 3

	Population, mln.	GDP per capita, 1995 PPP, '000	Openness (Impt+Expt)	Final Cons. Exp. of Gen. Govt, % GDP	Final Cons. Exp. of Gen. Govt, per Capita., 1995 PPP, '000	Pub. Educ. Exp., % GDP	Pub. Educ. Exp., per Capita, 1995 PPP, '000	Pub. Health Exp., % GDP	Pub. Health Exp., per Capita, 1995 PPP, '000
< 1 mln.	0,25	9,65	120,35	21,06	1,84	5,15	0,42	4,18	0,41
1-5 mln.	3,05	7,10	99,61	18,51	1,25	4,70	0,34	3,56	0,29
5-10 mln.	7,08	7,60	77,97	14,24	1,43	4,09	0,43	3,26	0,38
10-50 mln.	21,52	6,48	70,00	13,98	1,10	4,36	0,31	3,10	0,30
50-100 mln.	66,64	9,73	66,39	15,08	1,74	4,42	0,46	3,61	0,54
>100 mln.	353,81	7,85	40,93	13,16	1,19	2,89	0,31	2,49	0,37
LAC	13,26	6,40	86,38	15,08	0,85	4,39	0,27	3,45	0,21
LAC w/o Caribbean	20,95	6,17	69,03	12,90	0,67	4,01	0,21	3,55	0,20
Caribbean	1,48	6,69	111,17	17,89	1,10	4,88	0,33	3,33	0,22
All Countries	28,39	7,65	85,98	16,36	1,35	4,47	0,37	3,46	0,35

**Table 4a****Very minor change in regression for secondary enrolment in the right direction - carib effect is slightly more significant.**

Educational Expenditure and Outcomes, 1995-2002. OLS

	Log Pub. Exp. on Educ., %GDP	Log Pub. Exp. on Educ. per Capita	Log Primary Enrolment	Log Second. Enrolment	Log Tertiary Enrolment	Log PTR
Log Population	-0,034 [1.62]	-0,041 [2.03]**	0,008 [0.83]	0,038 [1.80]*	0,175 [4.25]***	0,004 [0.29]
Log GDP per Capita, 1995 PPP	0,139 [3.42]***	1,137 [29.25]***	0,118 [6.64]***	0,551 [14.12]***	0,998 [13.43]***	-0,285 [10.73]***
Advanced	0,082 [0.62]	0,076 [0.61]	-0,134 [2.29]**	-0,207 [1.62]	-0,335 [1.38]	-0,12 [1.39]
Caribbean	-0,029 [0.19]	-0,042 [0.29]	0,071 [1.08]	<b>0,27</b> [1.91]*	-0,101 [0.34]	0,039 [0.42]
Constant	1,222 [15.46]***	-3,377 [44.78]***	4,385 [124.78]***	3,114 [40.05]***	0,674 [4.47]***	3,654 [69.46]***
Observations	159	159	165	165	160	159
R-squared	0,16	0,91	0,25	0,65	0,63	0,59

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 4b****Life expectancy : Caribbean has a significantly higher life expectancy then other countries at the comparable level of income.**

No other health outcomes are significantly different in the Caribbean

Health Expenditure and Outcomes, 1995-2002. OLS

	Log Pub. Exp. on Health, %GDP	Log Pub. Exp. on Health per Capita	Log Priv. Exp. on Health per Capita	Log Pub. Exp. on Health, % Tot. Health Exp.	Log Infant Mortality	Log Mortality among Children Under 5	Log Life Expectancy	Log Hospital Beds per 1000 people	Log Phys- icians per 1000 people
Log Population	-0,078 [4.29]***	-0,078 [4.28]***	0,103 [3.72]***	-0,083 [5.73]***	0,002 [0.10]	0,005 [0.22]	0,009 [1.53]	-0,077 [1.53]	0,129 [2.61]**
Log GDP per Capita, 1995 PPP	0,244 [6.84]***	1,251 [35.01]***	0,973 [17.83]***	0,12 [4.20]***	-0,807 [19.03]***	-0,933 [19.87]***	0,152 [14.08]***	0,482 [4.87]***	1,033 [10.81]***
Advanced	0,399 [3.47]***	0,394 [3.41]***	0,106 [0.60]	0,111 [1.21]	-0,365 [2.66]***	-0,236 [1.55]	-0,07 [1.97]**	0,194 [0.77]	-0,493 [1.67]*
Caribbean	<b>-0,231</b> [1.85]*	<b>-0,226</b> [1.81]*	<b>0,379</b> [1.99]**	<b>-0,231</b> [2.31]**	0,065 [0.43]	0,084 [0.51]	<b>0,071</b> [1.84]*	-0,252 [0.89]	-0,034 [0.10]
Constant	0,836 [12.32]***	-3,769 [55.39]***	-4,119 [39.61]***	3,999 [73.22]***	4,521 [55.97]***	4,921 [54.99]***	3,925 [182.35]***	0,485 [2.21]**	-2,029 [10.96]***
Observations	163	163	162	162	163	163	166	109	153
R-squared	0,53	0,94	0,79	0,34	0,83	0,83	0,64	0,36	0,53

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 4c

Quality of institutions, 1995-2002. OLS

	KKZ Voice	KKZ Stability	KKZ Effectiveness	KKZ Regulation	KKZ Rule of Law	KKZ Corruption	ICRG	CPIA
Population	0	0	0	0	0	0	0.005	0
	[0.89]	[0.24]	[1.38]	[0.17]	[0.59]	[0.06]	[1.58]	[1.24]
GDP per Capita, 1995 PPP	0.113	0.129	0.147	0.137	0.157	0.142	1.948	0.146
	[6.48]***	[7.39]***	[12.24]***	[9.31]***	[13.24]***	[11.77]***	[11.09]***	[2.85]***
Sq. GDP per Capita	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.029	-0.001
	[3.68]***	[3.68]***	[5.02]***	[4.41]***	[5.79]***	[4.94]***	[5.22]***	[0.16]
Advanced	0.7	0.135	0.259	0.045	0.271	0.515	-2.267	0
	[3.01]***	[0.58]	[1.61]	[0.23]	[1.71]*	[3.19]***	[1.02]	[.]
Caribbean	<b>0.77</b>	0.284	0.001	0.134	0.134	0.159	1.7	-0.179
	[4.29]***	[1.47]	[0.01]	[0.88]	[1.10]	[1.28]	[0.73]	[0.99]
Constant	-0.705	-0.712	-0.883	-0.7	-0.909	-0.891	56.643	2.934
	[8.24]***	[8.22]***	[14.94]***	[9.67]***	[15.59]***	[14.99]***	[61.09]***	[26.49]***
Observations	165	159	165	165	165	165	128	126
R-squared	0.57	0.54	0.8	0.63	0.82	0.81	0.75	0.37

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 4d

Infrastructure, 1995-2002. OLS.

	Log Roads per 1 sq. km.	Log Paved Roads, % All Roads	Log Phone Mainlines	Log Improved Water Source	Log Improved Sanitary Facility
Log Population	1.773	0.055	0.002	0.007	-0.019
	[18.29]***	[1.46]	[0.06]	[0.51]	[0.81]
Log GDP per Capita, 1995 PPP	-0.245	0.573	1.455	0.194	0.294
	[1.35]	[8.06]***	[20.63]***	[7.52]***	[6.29]***
Advanced	2.16	-0.272	-0.351	-0.12	-0.171
	[3.58]***	[1.16]	[1.51]	[1.21]	[0.91]
Caribbean	-0.597	-0.082	<b>0.529</b>	0.067	-0.058
	[0.91]	[0.31]	[2.07]**	[0.80]	[0.39]
Constant	-4.423	2.659	2.103	4.085	3.9
	[12.32]***	[18.94]***	[15.12]***	[88.65]***	[46.66]***
Observations	165	161	166	135	128
R-squared	0.76	0.36	0.81	0.38	0.31

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 4e

Total Government spending, openness, inflation, 1995-2002. OLS.

	Log Final Cons. Exp. of Gen. Gov-t, % GDP	Log Final Cons. Exp. of Gen. Gov-t per Capita, '000	Log Tax Revenue per Capita, '000	Log Tax Revenue, % GDP	Log Openness	Log CPI Inflation
Log Population	-0.083	-0.075	-0.059	-0.061	-0.149	0.137
	[4.99]***	[4.27]***	[1.83]*	[1.87]*	[7.89]***	[2.55]**
Log GDP per Capita, 1995 PPP	0.098	1.091	1.164	0.179	0.146	-0.31
	[3.16]***	[33.18]***	[17.81]***	[2.72]***	[4.06]***	[2.96]***
Advanced	0.166	0.185	0.369	0.396	-0.308	-0.787
	[1.64]	[1.73]*	[2.03]**	[2.16]**	[2.63]***	[2.38]**
Caribbean	<b>-0.195</b>	-0.156	0.051	0.099	<b>-0.154</b>	-0.314
	[1.70]*	[1.29]	[0.19]	[0.36]	[1.17]	[0.86]
Constant	2.692	-1.932	-2.016	2.58	4.452	2.201
	[43.39]***	[29.54]***	[14.50]***	[18.43]***	[62.88]***	[10.61]***
Observations	161	161	121	121	163	149
R-squared	0.28	0.93	0.86	0.26	0.4	0.27

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 5**

Evolution of Income, Population, Openness, Gov't Spending and Outcomes in Education and Health, 1980-2002.

	GDP per capita, 1995 PPP, '000	Openness (Impt+ Expt)	Pub. Educ. Exp., per Capita, 1995 PPP, '000	Pub. Educ. Exp., % GDP	Prim. Enrol.	Sec. Enrol.	Ter. Enrol.	Pub. Health Exp., % GDP	Pub. Health Exp., per Capita, 1995 PPP, '000	Inf. Mort.	Mort. at 5 yrs	Life Exp.
<i>All Countries</i>												
1980-1984	6,41 134	75,41 143	0,33 112	4,49 132	92,34 154	50,60 151	13,16 142	. 0	. 0	67,40 171	100,66 171	61,95 187
1985-1989	6,57 148	71,87 153	0,32 130	4,21 150	92,90 150	54,88 151	14,25 139	. 0	. 0	. 0	. 0	63,76 194
1990-1994	6,80 165	78,92 181	0,34 151	4,43 164	93,00 171	58,23 171	17,19 167	. 0	. 0	52,79 183	77,23 183	64,74 196
1995-1999	7,34 166	83,65 181	0,36 158	4,46 170	96,80 182	64,19 182	20,24 175	3,45 187	0,34 162	48,70 185	70,52 185	65,37 197
2000-2002	8,12 165	89,07 173	0,40 101	4,57 108	100,14 168	73,35 154	28,40 127	3,49 187	0,37 161	44,81 189	64,84 189	65,72 197
Total	7,08 778	80,16 831	0,35 652	4,42 724	95,15 825	60,40 809	18,49 750	3,47 375	0,36 323	53,11 728	77,81 728	64,33 971
<i>LAC</i>												
1980-1984	5,00 31	79,41 33	0,21 25	4,33 28	100,50 26	48,98 26	14,63 25	. 0	. 0	55,81 27	75,74 27	66,39 35
1985-1989	5,28 32	77,93 33	0,19 28	3,92 30	103,27 24	51,90 24	14,89 21	. 0	. 0	. 0	. 0	68,04 35
1990-1994	5,67 32	85,85 34	0,21 29	3,89 32	102,61 27	55,51 27	18,04 27	. 0	. 0	36,53 32	46,94 32	69,54 35
1995-1999	6,28 32	86,89 34	0,25 28	4,25 30	108,00 32	65,76 32	19,80 31	3,39 33	0,20 31	31,06 33	39,03 33	70,74 36
2000-2002	6,63 32	85,77 34	0,33 19	5,01 21	110,32 32	78,21 30	24,10 19	3,53 33	0,22 31	26,14 33	32,52 33	71,50 36
Total	5,78 159	83,22 168	0,23 129	4,23 141	105,31 141	60,93 139	18,19 123	3,46 66	0,21 62	36,51 125	47,26 125	69,26 177
<i>LAC w/o Caribbean</i>												
1980-1984	5,10 18	49,73 18	0,17 14	3,76 15	101,35 18	44,01 18	16,81 19	. 0	. 0	57,22 18	78,11 18	66,15 21
1985-1989	5,11 18	49,69 18	0,13 15	3,00 16	103,58 17	48,91 17	17,59 15	. 0	. 0	. 0	. 0	68,04 21
1990-1994	5,45 18	65,36 20	0,16 17	3,41 19	104,88 19	51,86 19	20,91 19	. 0	. 0	37,67 18	48,28 18	69,62 21
1995-1999	6,11 18	68,82 20	0,21 15	3,98 17	109,98 21	62,46 21	22,56 21	3,46 18	0,19 17	31,67 18	39,17 18	70,97 21
2000-2002	6,31 18	69,54 20	0,25 11	4,36 13	111,56 20	74,17 18	25,61 15	3,68 18	0,20 17	25,69 18	31,19 18	72,08 21
Total	5,61 90	61,08 96	0,18 72	3,67 80	106,51 95	56,51 93	20,65 89	3,57 36	0,20 34	38,06 72	49,19 72	69,37 105
<i>Caribbean</i>												
1980-1984	4,87 13	115,02 15	0,25 11	4,99 13	98,59 8	60,18 8	7,71 6	. 0	. 0	53,00 9	71,00 9	66,75 14
1985-1989	5,51 14	111,81 15	0,26 13	4,98 14	102,53 7	59,17 7	8,14 6	. 0	. 0	. 0	. 0	68,03 14
1990-1994	5,96 14	115,13 14	0,28 12	4,60 13	97,20 8	64,17 8	11,24 8	. 0	. 0	35,07 14	45,21 14	69,42 14
1995-1999	6,49 14	112,71 14	0,31 13	4,60 13	104,21 11	72,06 11	14,02 10	3,32 15	0,21 14	30,33 15	38,87 15	70,41 15
2000-2002	7,05 14	108,95 14	0,44 8	6,07 8	108,24 12	84,28 12	18,45 4	3,36 15	0,23 14	26,67 15	34,10 15	70,69 15
Total	5,99 69	112,74 72	0,30 57	4,96 61	102,81 46	69,85 46	11,74 34	3,34 30	0,22 28	34,40 53	44,65 53	69,10 72

Source: WDI.

**Table 6**

	Log Final Cons. Exp. of Gen. Gov-t, % GDP	Log Final Cons. Exp. of Gen. Gov-t, % GDP	Log Pub. Exp. on Education, %GDP	Log Pub. Exp. on Education, %GDP	Log Pub. Exp. on Health, %GDP	Log Pub. Exp. on Health, %GDP
Log Population	-0.083 [4.99]***	-0.079 [4.70]***	-0.034 [1.62]	-0.023 [1.05]	-0.078 [4.29]***	-0.063 [3.43]***
Log GDP per Capita	0.098 [3.16]***	0.082 [2.32]**	0.139 [3.42]***	0.083 [1.85]*	0.244 [6.84]***	0.176 [4.51]***
Advanced	0.166 [1.64]	0.124 [1.12]	0.082 [0.62]	-0.078 [0.54]	0.399 [3.47]***	0.229 [1.89]*
Caribbean	-0.195 [1.70]*	-0.219 [1.86]*	-0.029 [0.19]	-0.126 [0.82]	-0.231 [1.85]*	-0.318 [2.57]**
Voice (KKZ)		0.044 [0.95]		0.162 [2.67]***		<b>0.183</b> <b>[3.65]***</b>
Constant	2.692 [43.39]***	2.715 [40.64]***	1.222 [15.46]***	1.303 [15.50]***	0.836 [12.32]***	0.927 [13.05]***
Observations	161	161	159	158	163	162
R-squared	0.28	0.28	0.16	0.2	0.53	0.56

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 7a: Effectiveness of Public Spending, 1995-2002, Caribbean Countries. OLS**

	Log Primary enrol.	Log Secon. enrol.	Log Tertiary enrol.	Log Inf. mort.	Log Mort. under 5	Log Life expect.	Log Road network density	Log Paved roads, %	Log Phone mainlines	Log Improved water source	Log Improved sanit. facility
Log Pub. Spending on Educ., % GDP	-0.03 [0.28]	0.209 [0.88]	0.962 [0.50]								
Log GDP per capita	-0.04 [0.55]	0.253 [1.61]	1.393 [1.18]	<b>-0.59</b> <b>[2.27]**</b>	<b>-0.68</b> <b>[2.34]**</b>	0.07 [1.44]	<b>-3.12</b> <b>[2.61]**</b>	1.348 [1.58]	<b>0.799</b> <b>[2.82]**</b>	0.005 [0.15]	0.164 [0.84]
Log Population	-0.01 [0.38]	-0.033 [0.61]	0.489 [0.82]	0.063 [0.61]	0.071 [0.62]	-0.02 [1.04]	<b>1.95</b> <b>[4.81]***</b>	0.274 [0.96]	<b>-0.23</b> <b>[2.40]**</b>	-0.017 [1.57]	0.013 [0.20]
Log Pub. Spending on Health, % GDP				-0.189 [0.32]	-0.119 [0.18]	-0.014 [0.12]					
Log Pub. Exp. Other than Educ. and Health, % GDP							2.458 [1.67]	0.373 [0.34]	-0.256 [0.74]	0.004 [0.10]	0.095 [0.39]
Constant	4.766 [19.65]***	3.565 [6.74]***	-1.339 [0.31]	4.462 [5.51]***	4.741 [5.24]***	4.124 [27.16]***	-4.776 [1.42]	0.62 [0.24]	4.249 [5.34]***	4.505 [49.67]***	3.967 [7.17]***
Observations	11	11	8	13	13	13	11	10	11	11	11
R-squared	0.04	0.49	0.27	0.58	0.59	0.48	0.89	0.32	0.79	0.48	0.14

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 7b: Effectiveness of Public Spending, 1995-2002. All Countries.**  
OLS

	Log Primary enrol.	Log Secun. enrol.	Log Tertiary enrol.	Log Inf. mort.	Log Mort. under 5	Log Life expect.	Log Road network density	Log Paved roads, %	Log Phone main- lines	Log Improv ed water source	Log Improved sanit. facility
Log Pub. Spending on Educ., % GDP	0.038 [1.05]	0.32 [4.23]***	0.478 [3.25]***								
Log GDP per capita	0.112 [5.92]***	0.523 [13.27]***	0.918 [12.00]**	-0.757 [16.15]***	-0.873 [16.85]**	0.16 [12.52]***	-0.029 [0.17]	0.555 [7.40]**	1.451 [19.66]	0.192 [7.38]**	0.276 [5.79]***
Log Population	0.006 [0.71]	0.035 [1.88]*	0.196 [5.01]***	-0.015 [0.72]	-0.015 [0.68]	0.003 [0.57]	1.814 [20.80]***	0.064 [1.68]*	-0.02 [0.54]	0.007 [0.52]	-0.014 [0.60]
Advanced Country	-0.135 [2.29]**	-0.277 [2.25]**	-0.34 [1.43]	-0.286 [2.05]**	-0.141 [0.92]	-0.074 [1.93]*	1.64 [2.94]***	-0.254 [1.05]	-0.427 [1.81]*	-0.129 [1.30]	-0.144 [0.76]
Log Pub. Spending on Health, % GDP				-0.202 [2.19]**	-0.245 [2.40]**	-0.019 [0.76]					
Log Pub. Exp. Other than Educ. and Health, % GDP							0.262 [1.05]	0.123 [1.12]	0.069 [0.65]	0.016 [0.46]	0.013 [0.20]
Constant	4.347 [77.38]***	2.749 [23.49]***	0.085 [0.37]	4.693 [44.23]***	5.13 [43.76]**	3.951 [136.40]***	-5.218 [8.38]***	2.418 [8.92]**	2.108 [7.95]*	4.068 [45.76]*	3.891 [24.30]***
Observations	158	158	153	163	163	163	151	148	152	125	118
R-squared	0.24	0.69	0.66	0.83	0.83	0.63	0.79	0.36	0.8	0.37	0.29

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 8a: Economies of Scale in Expenditure on Education. OLS. 1995-2002 Averages.**

	All	Caribbean	LAC	<=3 mln.	<=10 mln	>10 mln.
	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita
Log GDP per Capita	1.109 [22.94]***	0.675 [2.91]**	0.948 [6.98]***	0.939 [9.37]***	1.058 [17.01]***	1.267 [13.99]***
Log Population	-0.041 [2.08]**	-0.124 [1.81]	-0.059 [2.04]*	0.019 [0.27]	-0.066 [1.74]*	-0.04 [0.75]
ECA	-0.024 [0.16]			0.077 [0.19]	-0.238 [1.12]	0.324 [1.50]
MENA	0.001 [0.01]			-0.212 [0.59]	-0.264 [1.31]	0.544 [2.14]**
SSA	-0.175 [0.99]			-0.184 [0.46]	-0.421 [1.79]*	0.386 [1.27]
SAR	-0.26 [1.07]			0 [.]	0 [.]	0.183 [0.57]
LAC	-0.145 [1.00]			0.028 [0.08]	-0.302 [1.46]	0.029 [0.13]
EAP	-0.257 [1.64]			-0.012 [0.03]	-0.398 [1.75]*	0.003 [0.01]
Constant	-3.215 [16.78]***	-2.644 [6.23]***	-3.069 [12.42]***	-2.9 [6.36]***	-2.953 [11.43]***	-3.748 [10.73]***
Observations	159	12	28	45	92	67
R-squared	0.91	0.67	0.71	0.82	0.91	0.93

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 8b: Economies of Scale in Expenditure on Education. OLS. 1995-2002 Averages**

	All	Caribbean	LAC	<=3 mln.	<=10 mln	>10 mln.
	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita
Log GDP per Capita	1.122 [21.88]***	0.762 [2.25]*	1.028 [6.54]***	0.965 [8.85]***	1.069 [15.09]***	1.267 [13.74]***
Log Population	-0.042 [1.69]*	-0.106 [1.06]	-0.041 [0.76]	0.017 [0.25]	-0.059 [1.40]	-0.041 [0.60]
ECA	-0.004 [0.03]			0.088 [0.22]	-0.222 [0.97]	0.325 [1.43]
MENA	0.016 [0.10]			-0.207 [0.57]	-0.253 [1.21]	0.544 [2.12]**
SSA	-0.141 [0.77]			-0.165 [0.41]	-0.381 [1.53]	0.386 [1.25]
SAR	-0.225 [0.91]			0 [.]	0 [.]	0.184 [0.57]
LAC	-0.112 [0.75]			0.081 [0.22]	-0.252 [1.16]	0.029 [0.12]
EAP	-0.214 [1.25]			0.07 [0.17]	-0.329 [1.31]	0.004 [0.02]
Log Openness, % GDP	0.001 [0.01]	0.096 [0.18]	0.102 [0.45]	-0.172 [0.78]	0.04 [0.29]	-0.002 [0.01]
Constant	-3.256 [7.26]***	-3.229 [1.17]	-3.644 [3.22]***	-2.148 [2.00]*	-3.178 [5.21]***	-3.74 [4.56]***
Observations	156	11	27	43	89	67
R-squared	0.91	0.66	0.71	0.82	0.91	0.93

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 8c: Economies of Scale in Expenditure on Education, OLS.  
1995-2002 Averages.**

	All Log Pub. Exp. on Educ. per Capita, '000	Caribbean Log Pub. Exp. on Educ. per Capita, '000
Log GDP per Capita, 1995 PPP, '000	1.136 [22.13]***	0.591 [1.60]
Log Population, mln	-0.084 [2.43]**	0.038 [0.23]
Log Land Area	0.042 [1.70]*	-0.124 [1.09]
Log Openness, % GDP	0.035 [0.37]	0.504 [0.78]
ECA	-0.019 [0.12]	
MENA	0.005 [0.03]	
SSA	-0.155 [0.86]	
SAR	-0.133 [0.53]	
LAC	-0.124 [0.83]	
EAP	-0.207 [1.20]	
Constant	-3.437 [7.63]***	-4.852 [1.56]
Observations	155	11
R-squared	0.91	0.71

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%;

\*\*\* signif. at 1%

<b>Table 8d: Economies of Scale in Public Spending on Education, incl. enrolment as quantity/quality indicator. 1995-2002</b>	Log Public Exp. on Education per Capita, 000	Log Public Exp. on Education per Capita, 000	Log Public Exp. on Education per Capita, 000	Log Public Exp. on Education per Capita, 000	Log Public Exp. on Education per Capita, 000	Log Public Exp. on Education per Capita, 000
	All Countries	Caribbean	All Countries	Caribbean	All Countries	Caribbean
Log GDP per Capita, PPP 1995	1,109 [22.94]***	0,675 [2.91]**	0,96 [16.41]***	0,594 [2.35]*	0,958 [16.32]***	0,614 [2.92]**
Log Population	-0,041 [2.08]**	-0,124 [1.81]	-0,044 [2.33]**	-0,108 [1.38]	-0,119 [0.86]	-1,983 [2.16]*
eca	-0,024 [0.16]		-0,169 [1.16]		-0,165 [1.13]	
mena	0,001 [0.01]		0,015 [0.11]		0,021 [0.15]	
ssa	-0,175 [0.99]		0,03 [0.17]		0,04 [0.23]	
sar	-0,26 [1.07]		-0,262 [1.14]		-0,234 [0.99]	
lac	-0,145 [1.00]		-0,157 [1.13]		-0,147 [1.05]	
eap	-0,257 [1.64]		-0,221 [1.48]		-0,22 [1.47]	
Log Secondary Enrolment			0,382 [4.17]***	0,59 [1.01]	0,35 [3.22]***	1,424 [2.25]*
Log Population*Log Secondary Enrolment					0,018 [0.55]	0,442 [2.05]*
Constant	-3,215 [16.78]***	-2,644 [6.23]***	-4,545 [12.34]***	-5,033 [2.13]*	-4,413 [10.06]***	-8,58 [3.28]**
Observations	159	12	158	11	158	11
R-squared	0,91	0,67	0,92	0,76	0,92	0,86

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 9: Pupil-Teacher Ratio, 1995-2002 Average. OLS.<sup>27</sup>**

	All	Carib.	LAC	<=3 mln	<=10 mln	>10 mln
	Log PTR	Log PTR	Log PTR	Log PTR	Log PTR	Log PTR
Log Pub. Expenditure on Education, % GDP	-0.11 [2.87]***	-0.069 [0.68]	-0.148 [1.67]	-0.177 [2.96]***	-0.115 [2.61]**	-0.088 [1.12]
Log Population, mln	0.009 [0.94]	0.105 [4.55]***	0.023 [1.70]	0.062 [2.12]**	0.037 [2.18]**	-0.001 [0.03]
Log GDP per Capita	-0.149 [6.16]***	-0.229 [3.07]**	-0.263 [4.46]***	-0.183 [4.27]***	-0.135 [4.90]***	-0.161 [2.71]***
ECA^^	-0.025 [0.34]	0 [.]	0 [.]	-0.07 [0.42]	-0.019 [0.20]	-0.04 [0.31]
MENA	0.186 [2.52]**	0 [.]	0 [.]	0.17 [1.12]	0.167 [1.84]*	0.217 [1.40]
SSA	0.652 [7.45]***	0 [.]	0 [.]	0.572 [3.40]***	0.721 [6.76]***	0.564 [3.06]***
SAR	0.546 [4.60]***	0 [.]	0 [.]	0 [.]	0 [.]	0.55 [2.92]***
EAP	0.364 [4.69]***	0 [.]	0 [.]	0.362 [2.18]**	0.427 [4.18]***	0.336 [2.35]**
LAC	0.358 [4.96]***	0 [.]	0 [.]	0.352 [2.33]**	0.391 [4.21]***	0.381 [2.96]***
Constant	3.276 [30.09]***	3.818 [16.23]***	3.871 [22.17]***	3.494 [15.38]***	3.225 [23.55]***	3.301 [15.58]***
Observations	155	12	28	44	90	65
R-squared	0.81	0.89	0.58	0.82	0.84	0.79

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

<sup>27</sup> Results do not change significantly if 1990-2000 averages are used. We use 1995-2000 averages here to make comparisons of the education and health sectors easier.

**Table 10**

Educational Outcomes and Pupil-Teacher Ratio, 1995-2002. OLS.

	All	Caribbean	All	Caribbean
	Log Sec. Enrol.	Log Sec. Enrol.	Log Sec. Enrol.	Log Sec. Enrol.
Log Pupil-Teacher Ratio	-0.889 [8.28]***	-0.544 [2.26]**	-0.467 [3.67]***	-0.277 [0.67]
Log GDP per Capita, mln.			0.323 [7.55]***	0.378 [2.19]*
ECA	-0.05 [0.42]	0 [.]	0.352 [3.00]***	0 [.]
MENA	-0.241 [1.95]*	0 [.]	0.043 [0.36]	0 [.]
SSA	-0.613 [4.00]***	0 [.]	-0.219 [1.38]	0 [.]
SAR	-0.219 [1.11]	0 [.]	0.315 [1.53]	0 [.]
EAP	-0.159 [1.21]	0 [.]	0.128 [0.97]	0 [.]
LAC	-0.022 [0.18]	0 [.]	0.208 [1.76]*	0 [.]
Constant	7.064 [23.93]***	6.017 [8.01]***	4.957 [11.65]***	4.537 [2.91]**
Observations	178	16	159	12
R-squared	0.71	0.27	0.8	0.61

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 11:**

Economies of Scale in Expenditure on Education, OLS. 1995-2002

Averages.

	All	Caribbean	Caribbean	Caribbean
	Log Pub. Exp. on Educ. per Capita, '000	Log Pub. Exp. on Educ. per Capita, '000	Log Pub. Exp. on Educ. per Capita, '000	Log Pub. Exp. on Educ. per Capita, '000
Log GDP per Capita, 1995 PPP, '000	1.068 [19.20]***	0.591 [1.60]	0.551 [3.20]**	0.551 [3.41]***
Log Population, mln	-0.066 [1.88]*	0.038 [0.23]	0.017 [0.24]	
Log Land Area	0.044 [1.82]*	-0.124 [1.09]	-0.084 [1.67]	-0.076 [2.17]*
Log Openness, % GDP	0.052 [0.55]	0.504 [0.78]		
Voice	0.177 [2.85]***		0.646 [3.05]**	0.627 [3.39]***
ECA	0.125 [0.77]			
MENA	0.261 [1.49]			
SSA	0.016 [0.08]			
SAR	-0.037 [0.15]			
LAC	-0.023 [0.15]			
EAP	-0.042 [0.23]			
Constant	-3.597 [7.99]***	-4.852 [1.56]	-2.882 [8.64]***	-2.875 [9.21]***

Observations	154	11	12	12
R-squared	0.92	0.71	0.87	0.87

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 13**

Economies of Scale in Expenditure on Health

	All	Caribbean	LAC	<=3 mln.	<=10 mln	>10 mln.
	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita	Log Pub. Exp. On Educ. Per Capita
Log GDP per Capita	1.204 [28.11]***	0.925 [6.72]***	1.122 [12.12]***	0.938 [12.23]***	1.14 [19.68]***	1.335 [19.35]***
Log Population	<b>-0.06</b> [3.45]***	<b>-0.09</b> [1.96]*	-0.014 [0.63]	-0.003 [0.06]	-0.017 [0.50]	-0.083 [2.04]**
ECA	-0.263 [2.04]**	0 [.]	0 [.]	-0.321 [1.13]	-0.408 [2.19]**	0.014 [0.08]
MENA	-0.483 [3.68]**	0 [.]	0 [.]	-0.653 [2.56]**	-0.349 [1.96]*	-0.461 [2.36]**
SSA	-0.544 [3.50]***	0 [.]	0 [.]	-0.999 [3.48]***	-0.539 [2.53]**	-0.351 [1.50]
SAR	-0.928 [4.38]***	0 [.]	0 [.]	0 [.]	0 [.]	-0.647 [2.63]**
LAC	-0.433 [3.44]***	0 [.]	0 [.]	-0.749 [2.89]***	-0.406 [2.20]**	-0.301 [1.81]*
EAP	-0.705 [4.89]***	0 [.]	0 [.]	-0.798 [2.64]**	-0.517 [2.32]**	-0.725 [3.83]***
Constant	-3.28 [19.47]***	-3.435 [14.87]***	-3.619 [21.78]***	-2.518 [7.49]***	-3.215 [13.49]***	-3.522 [13.26]***
Observations	163	13	31	44	93	70
R-squared	0.95	0.91	0.85	0.93	0.94	0.97

Absolute value of t statistics in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 14a**

Physicians per 1000 people

	All	Caribbean	LAC	<=3 mln.	<=10 mln	>10 mln.
	Log Physic. Per 1000 people	Log Physic. Per 1000 people	Log Physic. Per 1000 people	Log Physic. Per 1000 people	Log Physic. Per 1000 people	Log Physic. Per 1000 people
Log GDP per Capita	0.52 [7.69]***	1.17 [5.02]***	0.684 [4.79]***	0.76 [4.57]***	0.546 [6.00]***	0.467 [3.98]***
Log Population	<b>0.087</b> [3.19]***	<b>0.178</b> [2.21]*	<b>0.129</b> [3.52]***	<b>0.27</b> [2.59]**	<b>0.138</b> [2.60]**	0.107 [1.41]
ECA	0.915 [4.52]***	0 [.]	0 [.]	0.515 [0.86]	1.042 [3.48]***	0.662 [2.40]**
MENA	-0.144 [0.70]	0 [.]	0 [.]	-0.278 [0.52]	-0.045 [0.16]	-0.353 [1.09]
SSA	-1.897 [7.72]***	0 [.]	0 [.]	-1.395 [2.24]**	-1.752 [5.07]***	-2.145 [5.53]***
SAR	-1.404 [3.93]***	0 [.]	0 [.]	0 [.]	0 [.]	-1.505 [3.52]***
LAC	-0.182 [0.94]	0 [.]	0 [.]	0.019 [0.04]	-0.175 [0.61]	-0.11 [0.40]
EAP	-0.771 [3.48]***	0 [.]	0 [.]	-0.231 [0.36]	-0.786 [2.36]**	-0.738 [2.30]**
Constant	-0.806 [3.06]***	-2.261 [5.78]***	-1.307 [4.96]***	-1.331 [1.86]*	-0.894 [2.41]**	-0.757 [1.68]*
Observations	153	13	32	42	89	64

R-squared	0.85	0.72	0.51	0.79	0.82	0.89
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Absolute value of t statistics in brackets  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 14b**

Hospital Beds per 1000 people						
	All	Caribbean	LAC	<=3 mln.	<=10 mln	>10 mln.
	Log Hospital Beds Per 1000 people	Log Hospital Beds Per 1000 people	Log Hospital Beds Per 1000 people	Log Hospital Beds Per 1000 people	Log Hospital Beds Per 1000 people	Log Hospital Beds Per 1000 people
Log GDP per Capita	0.3 [4.18]***	0.665 [3.12]**	0.6 [5.44]***	0.397 [1.90]*	0.185 [1.99]*	0.379 [2.75]***
Log Population	<b>-0.1</b> [3.55]***	-0.115 [1.57]	<b>-0.12</b> [4.14]***	-0.088 [1.19]	<b>-0.15</b> [3.17]***	0.02 [0.26]
ECA	0.444 [2.46]**	0 [.]	0 [.]	0.219 [0.51]	0.16 [0.65]	0.693 [2.48]**
MENA	-0.894 [5.03]***	0 [.]	0 [.]	-0.848 [2.39]**	-0.979 [4.49]***	-0.778 [2.32]**
SSA	-1.756 [5.47]***	0 [.]	0 [.]	0 [.]	-1.666 [3.70]***	-1.567 [2.91]***
SAR	-2.829 [5.52]***	0 [.]	0 [.]	0 [.]	0 [.]	-2.528 [3.96]***
LAC	-0.889 [5.13]***	0 [.]	0 [.]	-0.503 [1.13]	-1.128 [4.76]***	-0.797 [2.89]***
EAP	-0.459 [1.83]*	0 [.]	0 [.]	0 [.]	0 [.]	-0.436 [1.32]
Constant	1.298 [4.86]***	-0.123 [0.34]	-0.079 [0.39]	0.908 [1.20]	1.748 [4.98]***	0.622 [1.21]
Observations	109	13	32	24	60	49
R-squared	0.79	0.73	0.67	0.65	0.73	0.84

Absolute value of t statistics in brackets  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 15**

Infant Mortality and Scale in Health Sector.

	All	Caribbean	LAC	<=3 mln.	<=10 mln	>10 mln.	All	Caribbean	LAC	<=3 mln.	<=10 mln	>10 mln.
	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.	Log Inf. Mort.
Log GDP per Capita	-0.674 [12.06]***	-0.601 [1.89]*	-0.682 [4.76]***	-0.598 [4.36]***	-0.679 [9.52]***	-0.61 [5.98]***	-0.73 [11.66]***	-0.541 [1.55]	-0.67 [3.91]***	-0.613 [2.66]**	-0.769 [9.49]***	-0.619 [5.37]***
ECA	0.31 [2.06]**	0 [.]	0 [.]	0.265 [0.62]	0.309 [1.42]	0.415 [1.87]*	0.214 [1.45]	0 [.]	0 [.]	0.295 [0.68]	0.143 [0.69]	0.431 [1.88]*
MENA	0.507 [3.51]***	0 [.]	0 [.]	0.331 [0.88]	0.392 [2.01]**	0.837 [3.32]***	0.381 [2.54]**	0 [.]	0 [.]	0.433 [1.05]	0.373 [1.87]*	0.604 [2.20]**
SSA	0.772 [3.68]***	0 [.]	0 [.]	0.928 [1.99]*	0.736 [2.64]***	1.006 [2.72]***	0.379 [1.37]	0 [.]	0 [.]	0 [.]	0.537 [1.32]	0.505 [1.12]
SAR	0.319 [1.19]	0 [.]	0 [.]	0 [.]	0 [.]	0.549 [1.55]	0.112 [0.25]	0 [.]	0 [.]	0 [.]	0 [.]	0.104 [0.18]
LAC	0.505 [3.73]***	0 [.]	0 [.]	0.37 [0.96]	0.454 [2.37]**	0.696 [3.28]***	0.394 [2.84]***	0 [.]	0 [.]	0.608 [1.36]	0.476 [2.39]**	0.481 [2.07]**
EAP	0.235 [1.39]	0 [.]	0 [.]	0.132 [0.29]	0.214 [0.87]	0.352 [1.41]	-0.061 [0.30]	0 [.]	0 [.]	0 [.]	0 [.]	0.004 [0.02]
Log Physicians per 1000 people	-0.07 [1.22]	-0.12 [0.43]	-0.032 [0.25]	-0.129 [1.16]	-0.097 [1.32]	-0.034 [0.34]						
Log Hospital Beds per 1000 people							-0.088 [1.18]	-0.192 [0.58]	-0.04 [0.26]	0.086 [0.37]	0.039 [0.37]	-0.176 [1.45]
Constant	3.817 [21.56]***	4.177 [6.41]***	4.337 [17.47]***	3.706 [7.00]***	3.827 [15.65]***	3.611 [12.06]***	4.095 [20.12]***	4.336 [10.92]***	4.352 [19.48]***	3.421 [4.36]***	3.932 [13.33]***	3.928 [11.24]***
Observations	151	13	31	42	87	64	108	13	31	24	59	49
R-squared	0.86	0.55	0.54	0.81	0.86	0.88	0.87	0.55	0.54	0.7	0.86	0.89

Absolute value of t statistics in brackets  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

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