ANALYZING THE GROWTH PERFORMANCE OF THE PACIFIC ISLAND COUNTRIES – THE INSTITUTIONAL APPROACH

By

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A thesis submitted for the degree of Doctor of Philosophy at the Australian National University, Canberra. February 2002
Dedicated

to all my children
Declaration

Except where otherwise indicated,
this thesis is my own work.

Teuea Toatu
February 2002
Acknowledgements

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It would be remiss of me not to mention one of the pioneer members of my panel, the late Dr Neil Vousden, whose untimely death prevented him from taking part in the further development of the project. Together with Professor Duncan, Dr Vousden was instrumental in the surge of my interest in the institutional aspects of development. It is a matter of great regret, therefore, that Dr Vousden cannot witness the completion of this study.

Finally, but not least, I must thank my children for the hardships that they had to endure as a result of this undertaking. Needless to say, my achievement is their achievement and they can all take joy and pride in the accomplishment of this worthwhile, but arduous, journey.
ABSTRACT

This study assesses the extent to which institutions, or the qualities thereof, impact on the growth performance of the Pacific Island countries (PICs). The fundamental proposition evaluated is that the poor economic performance of the PICs in recent decades reflects the poor quality of the institutional environment. The study tests this proposition using estimated levels of corruption, property rights security, and civil liberty as indicators of institutional effectiveness.

The results of the tests indicate that ineffective institutions, leading to contract insecurity, as well as corrupt practices and constrained civil liberties account for large reductions in the average rate of growth of national income in these countries. These results imply that, ultimately, it is neither the lack of resources nor ineffective policies that constrain the economic growth of the PICs, but rather the lack of appropriate institutions and incentives that would make policies and resources effective. The results also underscore the point that the so-called “Pacific Paradox” is largely an institutional problem.

A major contribution of this study is the development of a composite corruption index based on the Principal Components Analysis framework. The development of this composite index is necessitated by the exclusion of the PICs from the existing institutional indices produced by the various risk-rating organizations.
The study also explored the channels through which corruption may affect economic growth. The extent of public investment and the size of the public sector were identified and strong positive relationships were found between corruption and these two variables.

It is concluded that any effort to address the poor economic performance of the PICs must begin by addressing the institutional roots of the problem.
GLOSSARY

ADB  Asian Development Bank
CAPCV  The variability of public capital expenditure as measured by its coefficient of variation
CIM  Contract Intensive Money
CRRPT  The corruption index
DEBT  The ratio of public debt to GDP
ECONTE  The ratio of Government expenditure on economic services
ECSDP  The ratio of Government GDP to Private GDP
FREE  The civil liberty index (Freedom House ratings)
FSM  Federated States of Micronesia
GDP  Gross Domestic Product
GOVTC  The Ratio of Government Consumption to GDP
IMF  International Monetary Fund
MES  Minimum Efficient Scale
PICS  Pacific Island Countries
PMCs  Pacific Member Countries of the World Bank
SISs  Small Island States
SUBGDP  The ratio of Public subsidies to GDP
SUBTE  The ratio of expenditure on subsidies to total Government expenditure

For Tables

-  Not available
na  Not applicable
Av.  Average
$  Australian dollar (unless otherwise indicated)
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CHAPTER 1

INTRODUCTION

Objective of Study

While the performance of the East Asian countries over recent decades has been labeled ‘miraculous’, that of the Pacific Island countries (PICs) has been described in terms of a ‘paradox’. The term ‘Pacific Paradox’ has become a popular way of describing the PICs’ economic performance – continued slow income growth despite favorable levels of natural and human resources, high levels of public investment and aid, and reasonably prudent economic management. A number of reports, including those by the World Bank and IMF, have indicated that the PICs are well endowed with natural and human resources, have the highest levels of foreign aid in per capita terms, and most of them adopt prudent economic policies. Yet, despite these good things, the economic growth rates in the PICs have been disappointingly low. ¹

Paradoxical or not, the question remains as to what accounts for this continued dismal performance of the PICs when countries elsewhere of the same size and characteristics have registered impressive growth performance during the same period?² Some analysts see the issue in terms of policy failure; others believe that

¹ Although, on average, the PICs invested about 29 percent of GDP during the 1980s, economic growth averaged only around 2 percent per annum. (The East Asian Economies invested about the same proportion but achieved a growth rate double that registered by the PICs during the period). Average GDP growth improved slightly to 3.1 percent in the 1990s, but this was mainly because of exceptional performance by some countries, notably Fiji, during this period.

² For instance, for the 10-year period 1983-93, the average annual GDP growth rate in the PICs was 2.2 percent while for the Caribbean and Africa and Indian Ocean island countries it was 3.2 and 5.4 percent, respectively (Fairbairn and DeLisle Worrell, 1995).
high levels of foreign aid and public investment have caused the public sector to crowd-out private sector investment and production (World Bank, 1991). Still others believe that, whatever the PICs do, they are doomed to perform poorly because of the unfortunate reality of their being small and the consequent severe physical and resource constraints they face, including distance from the major world markets (Lodewijks, 1998). According to this fatalist view, these constraints pose severe limits on the growth potential of the PICs by limiting what might be called their “capacity of transformation” – making it difficult, if not impossible, for them to achieve respectable growth performance.

While there is something to each of these explanations, they do not get to the heart of the matter. For instance, the experience of some of the PICs, notably Kiribati, would render the policy-failure argument untenable. The Kiribati government has been noted for its sound and responsible economic policies. Yet, Kiribati has hitherto been performing very poorly, registering very low and, sometimes, negative annual GDP growth rates. It would appear, therefore, that the benefits of good policies in the case of Kiribati are marginal, if not negligible. In this context, it is not clear what specific policies governments should pursue beyond the standard set of policies necessary to induce solid growth in the economy.

With regard to the structural- and resource-constraints argument, again this proposition lacks substance. Empirical studies by Easterly and Kraay (1999) and Acemoglu et al. (2000) have shown that there is no statistically significant relationship between the size of the country or its geography and its growth potential. These two studies argue that, after controlling for institutions, these factors do not matter. The upshot of these findings is that these structural and resource factors are not sufficient

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3 Refer to Chapter 7 of the thesis and also Toatu (2001) for fuller discussion of this point.
4 For example, for the period 1989-93, Kiribati’s average real GDP growth rate was highly negative at -2.4 percent.
to condemn the small island states, such as the PICs, to continued poor economic growth. That is, they simply cannot be used as justifications for these small countries to continue to perform poorly. If there is anything that the success stories of other small island states, such as Hongkong and Singapore, or even smaller countries in the Caribbean and Indian Ocean, have demonstrated, it is that small countries are more adept at surviving economically and performing more successfully than what has generally been believed, provided they get the fundamentals right.

It is the fundamental hypothesis of this study that the continued poor growth performance of the PICs reflects the quality of the institutional environment in these economies. That is, the problems of the PICs are not so much about the lack of capital (as broadly defined) and good policies; rather they are about the lack of incentives to deploy these resources well and effectively. This proposition brings to bear the important role that institutions play in the provision of such incentives.

The **dictum** that “people respond to incentives” is nowhere more true than in the Pacific. In fact, for the PICs there is a greater need to create the incentives for people to invest efficiently, transfer their capital and technology, increase their skills, and hence be more productive. As argued in this study, the greatest institutional disincentives to economic growth and development in the PICs are: inadequate property rights regimes arising from the widespread communal ownership of land; corruption in the bureaucracy; lack of law and order; and suppressed civil liberty. Therefore, if there is one fundamental factor that accounts for the continued poor performance of the PICs in spite of the resources they have, including the trading privileges that they enjoy, it is the lack of an appropriate incentive structure that is conducive to the efficient and effective utilization of these resources and opportunities.
This key hypothesis does not mean that resources and policies are insignificant in the growth process. The point is that in the absence of workable and effective institutions, the potential contribution of these resources and policy reforms to growth may be severely hampered. For instance, what is the point of adopting policies that will promote private sector development, and hence capital accumulation, when the property rights regime is in shambles? What is the point of investing in human capital when job opportunities in the public sector are limited, and the development of the private sector, the only other source of employment, is constrained by weak institutional infrastructures? What is the point of having good laws and legal systems when they cannot be enforced and applied consistently and independently due to corruption and the lack of an appropriate incentive structure within the bureaucracy?

Recognizing both the conceptual and practical complexities relating to the study of the institution-growth relationship, the present study sets out to investigate empirically the answers to the following key questions, with special reference to the PICs:

1) To what extent do institutions, or the qualities thereof, affect the growth performance of the small island states?

2) How may the effectiveness of institutions be measured in the context of the small island states?

**Approach and Methodology**

In testing this key proposition and in accomplishing its objectives as outlined above, the study proceeds as follows:
1) Develop a theoretical framework to capture the dynamic relationships between corruption and the growth variables. The preferred theoretical model is one based on an inter-temporal optimizing growth framework as in Ram (1993) and Leites and Weidmann (1999). The preference for dynamic, as opposed to static, modeling is dictated by the need to highlight the dynamic interrelationships between the variables, which the static model is incapable of doing.

2) Carry out an empirical analysis to test the key hypotheses posited in the study, using data from the selected countries of the South Pacific. This entails the following operations:

- Identify the measures or indicators of institutional effectiveness that are appropriate to the PICs. For the reasons described in Chapter 8, the indicators of institutional effectiveness used in the study are based on the levels of corruption, property rights security, and civil liberty. These are the main institutional variables used in the regressions in the empirical part of the study.

- Because of the inadequacies of the existing corruption indices developed by Transparency International (TI) and other risk-rating agencies, construct a composite corruption index based on hard data as a measure of the level of corruption in the PICs. This composite corruption index is constructed from a set of public finance variables believed to be closely linked to corrupt or rent-seeking practices within the public sector, using the Principal Component Analysis (PCA) methodology. The construction of this composite corruption index represents an important innovation and major contribution of the study.

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5 For ease of analysis and to render tractable the formulation of a theoretical model capturing the institution-growth relationships, it is appropriate to focus on one key indicator of institutional quality. In this context and for the reasons explained in the text, corruption is chosen.

6 See Chapter 8 for a detailed discussion of the construction of this corruption index.
(For its measure of the level of property rights security, the study uses the index developed by Clague et al (1999) which was based on the concept of contract-intensive-money).

(For its measure of civil liberty, the study uses the qualitative scores provided by Freedom House, which, fortunately, includes all of the PICs).

- Assess the relationship between the effectiveness of institutions - as measured by the level of corruption, property rights security and civil liberty - and economic growth, using the indices developed above and the appropriate conditioning variables. These findings represent the main findings of the study.

- Extend the analysis on corruption and explore the different channels through which corruption affects economic growth. The two channels identified are public investment and the size of the public sector (as measured by the level of government expenditure on public administration).\(^7\) The basic argument is that, in the context of the PICs, both these variables are highly susceptible to corrupt and rent-seeking motives - hindering their quality and productivity. In the case of public investment, cases abound supporting the suspicion that public investments are allocated more on the basis of their kickbacks-generating capacity than on economic merit.\(^8\) Likewise, the public sector in these countries tends to be over-sized either because of corrupt recruitment policies or because of the excessive intervention of government in what would otherwise be private sector activities. Accordingly, the following hypotheses are also tested:

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\(^7\) These are not the only channels through which corruption works, but they are the two most important ones in the case of the PICs.

\(^8\) This is true in that, as in most countries, politicians or high ranking officials have considerable influence over decisions determining the size of the public investment budget, the composition of that budget, the choice of projects and their locations, and even the size and design of each project.
• **Hypothesis 2:** Other things being equal, public investment is tied to the level of corruption. The corollary is that, because of the low productivity of public investment due to the presence of corruption, private investment tends to be negatively correlated with the level of public investment;

• **Hypothesis 3:** Other things being equal, the size of the public sector tends to be closely related to the level of corruption within the public sector.

3) Finally, evaluate the policy implications of the empirical results of the study for the development of an optimal institutional framework and the growth strategies appropriate for the economies of the PICs.

Because of data constraints and the limited number of observations, the regressions are carried out on the basis of pooled data as in Parks (1967) and Kmenta (1986). Although the analysis is restricted to the selected PICs - Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu - the findings of this study, and their policy implications, have general applicability for the rest of the PICs.

**Need for Study**

Although the literature has seen rapid growth in studies relating to institutions/corruption-economic growth relationships, little if any work on this topic has been done in the context of the South Pacific island economies. Aside from a lack of interest from outside the region, the lack of data would be a major reason for limited empirical work covering these countries, and precludes their inclusion in the
institutional measures developed by the various risk-rating organizations such as Transparency International and the World Bank. Accordingly, there is limited knowledge of the impact of the institutional forces operating in the PIC economies.

It is important, therefore, that research is undertaken in this area for the PICs in order to place in perspective the importance of institutions in the growth performance of these island economies. The growing concerns about the so-called ‘Pacific Paradox’ have not only highlighted the inadequacy of the traditional approach to explaining the growth performance of the PICs, but also heightened the need to dig more deeply into the institutional roots of the problem.

The present study, therefore, serves to bridge this knowledge gap by providing a quantitative analysis of the role of institutions in the growth process of the PICs. By providing alternative measures of institutional effectiveness that are appropriate for the PICs, the study represents an important breakthrough in terms of allowing empirical analysis of the significance of corruption and other institutional factors in the growth performances of these island economies. The results of the study could provide the framework and impetus for further investigation and development in this important area of research.

**Structure of Study**

The study is divided into ten chapters. The next chapter, Chapter 2, critically reviews the economic performance of the PICs over the past two decades. It seeks to bring to the fore the key macroeconomic policies, including the policy failures and successes, that underline the PICs’ economic performance during the period. Chapter 3 and Chapter 4 provide an overview of the literature relating to growth theory and institutions. The aim is to lay the foundation for the development of a theoretical
model and analysis of the role of institutions in the growth process. Chapter 5 analyzes the role that institutions play in the growth performance of the PICs. In doing this, the chapter adopts a heuristic approach by comparing the potential contributions of institutions vis-a-vis the traditional determinants of economic growth. Chapter 6 focuses on the corruption indicator of institutional effectiveness, analyzing its impact on the level and quality of public investment. The key contribution of this chapter is the development of a theoretical model, based on an inter-temporal optimizing growth framework, that captures the dynamics of the relationships between the level of corruption and public investment. Chapter 7 examines the issues relating to the measurement of institutional effectiveness – based on the level of corruption, property rights security, and civil liberty – and their implications for empirical analysis. After considering the different methodologies for the construction of composite indices, the chapter discusses the corruption index developed by the study. Chapter 8 presents the empirical results based on the tests carried out in relation to the hypotheses posited in the study. This is the most important part of the study. Chapter 9 encapsulates the policy implications and actions that the PICs need to take to address the perceived institutional deficiencies reported in the study. Finally, Chapter 10 contains a summary and main conclusions of the study, as well as suggestions for future research in this important area of study.
CHAPTER 2

GROWTH AND ECONOMIC PERFORMANCE - A CRITICAL REVIEW

Introduction

The Pacific islands region embraces 24 nations and territories that are quite diverse. They differ in ethnic composition from the Micronesian countries located in the North Pacific to the Polynesian and the Melanesian countries in the South Pacific. Their geographical terrain varies from atoll countries such as the Marshall Islands and Kiribati, to volcanic ones such as Vanuatu and Papua New Guinea. Despite their mostly limited land mass, the countries are quite well endowed with natural resources which include vast fisheries and other marine resources, forests, arable land and minerals. There is also considerable tourism potential. Rich cultural traditions including the extended family system, customary land ownership, and benefit-sharing practices have endowed their populations with a relatively safe and secure lifestyle. However, despite their relatively strong natural resource base, coupled with the high levels of overall investment and foreign aid that they receive each year, economic growth in the Pacific Island Countries (PICs) has hitherto been slow.

It is the purpose of this chapter to critically review the economic performance of the PICs with a view to placing in context explanations for the relatively poor performance of these economies during the past two decades. This entails examination of the key macroeconomic policies considered to have played a significant part in the growth performance of these countries. The outcome of this examination sets the stage for a thorough analysis of the role of institutions in the growth performance of these countries, which is the subject of the ensuing chapters.
The Small Island States – Their Special Problems And Characteristics

Since the PICs are a microcosm of the ‘small island states’ universe, it is appropriate that a review of the special problems and characteristics of the small island economies in general is made at this juncture. This helps put in context the distinguishing features of these states that bear significantly on their economic performance. It also enables analysis of how the PICs compare with other small island states in terms of the constraints and opportunities they face.

The literature on the small island states (SISs) has tended to associate their economic problems with severe structural constraints inherent in their being relatively small. These include a narrow production base, heavy dependence on a few primary products for export earnings, isolation from the major world markets, and small and fragmented domestic markets. These constraints pose severe limits on the growth potential of these economies by limiting what is called their “capacity of transformation”.

The most crucial of these constraints is the smallness of the size of the domestic market, which has several implications for the growth prospects of the SISs. First, as a result of the level of domestic demand lying below the minimum efficient scale (MES) of output, the small island states are usually at a disadvantage as a location for large scale industries, particularly those associated with high growth effects. Second, the small domestic market limits the options available in terms of the economic activities that the SISs could undertake. In particular, the interaction between the small size of the domestic market, the MES of output and the labor supply constraint implies a narrow range of domestic outputs and limited potential to undertake import-substitution activities. The excessive dependence upon a small number of economic activities exposes these economies to the risk of exogenous
shocks, which is exacerbated by the shallow nature of local industry linkages. Finally, a small domestic market prevents the emergence of competitive milieu because of the very small number of participants involved in any economic activity. As such, the small island states experience generally higher prices for intermediate inputs and finished goods than larger states.

Another important characteristic of the small island states is their susceptibility to diseconomies of scale in production, investment, consumption, transportation, education, and administrative services. This is because most of these states suffer from internal geographical fragmentation and are located far from large foreign markets. Other associated problems include high transport costs and a high degree of dependence on adjacent states for surface communications and port facilities and, therefore, access to export markets and import sourcing. It has been established that the heavy burden of transportation costs may be the single most important barrier to the socioeconomic development of the small islands (Kakazu, 1994).

The final characteristic of the small island states, which is more or less related to the aforementioned constraints, is their heavy dependence on government activities as a source of income and employment.

Notwithstanding these salient features of the SISs, some characteristics arising from smallness have been identified as being advantageous. The latter include greater social homogeneity and cohesion, a consequent greater flexibility and decision-making efficiency, greater openness to change, and the gains from international trade. For instance, social homogeneity tends to make it easier for the small island states to forge the political consensus required to adjust to a changing environment.
Economic Structure of the PICs

Being typical small island economies, the PICs are constrained in their development efforts by the problems outlined above: small internal markets, a narrow production base, high unit costs of infrastructure, and vulnerability to external shocks and natural disasters. Interacting with a narrow resource base, the small size of the domestic market makes the PIC economies relatively undiversified and highly open to international trade. The remoteness and isolation of these countries from major centers of trade and commerce makes it difficult to compensate for the limited domestic markets by turning to world markets. As well, most have limited capacity for absorption of waste from economic activities, particularly manufacturing.

The share of manufacturing in GDP in the PICs is generally under 10 percent. Manufacturing is limited to basic small-scale "low technology" activities like food processing and breweries, which are not greatly impacted by market size. The exceptions are Fiji and Papua New Guinea where the share of manufacturing is over 15 percent.

In the absence of a large manufacturing sector, the PICs are dependent on the primary and tertiary sectors of the economy as a source of output, employment, and foreign exchange. Agriculture is the most important source of employment in the PICs and, on average, it accounts for 29 percent of GDP. A large share of production is in the form of smallholder operated, semi-subsistence, household enterprises growing chiefly root crops and garden vegetables. In Fiji, agriculture is organized more along commercial lines, although the subsistence sector remains important. Large-scale agriculture comprises oil palm, coconut, cocoa, and coffee plantations as in Papua New Guinea, and beef cattle in Vanuatu - with the bigger and more capital
intensive operations wholly or partially foreign-owned. The sharp fall in prices of traditional PIC cash crops has stimulated producers to move into non-traditional crops to exploit niche markets in squash pumpkins, vanilla, melons, kava, and coconut cream. Overall, the performance of the agriculture sector over the years has been disappointing.

The contribution of the tertiary sector ranges from 55 to 60 percent in Fiji, Samoa, Tonga, and Vanuatu, while in FSM, Marshall Islands and Kiribati, it is greater than 75 percent. In the tertiary sector, the two important activities are public services and tourism related services.

**Economic Performance**

During recent decades, economic growth in the PICs has been very volatile reflecting, in part, their dependence on a narrow range of primary export commodities which are subject to exogenous shocks as well as natural disasters and political developments. Figure 2.1, which covers only the six Pacific countries that are members of the World Bank, demonstrates this point.

The economic growth pattern has been a series of growth spurts followed by plunges that effectively cancel each other out. This is not surprising given the PICs’ extreme vulnerability to external shocks, i.e., natural disasters and the dependence on production of a narrow range of commodities which are subject to large price and quantity variations, as already explained.

As a group, the PICs recorded an average annual output growth rate of 2.1 percent during the 1980s. This was a dismal performance given that the countries had
invested an average of 29 percent of GDP in their economies.\textsuperscript{9} Real GDP growth rate per capita was much lower, averaging 0.4 percent per year over the period. If Fiji, which accounts for two thirds of the group’s output is excluded, per capita real GDP growth fluctuated around an average negative rate of -0.2 percent annually.

In the 1990s marked improvements were noted. The region averaged a growth rate of 3.1 percent during the 1992-96 period, although this was mainly due to Fiji, which accounts for 62 percent of total GDP of the group. Growth was also nudged upwards by the major recovery in domestic production in Samoa after the cyclone devastation of 1990-92, and by unsustainable logging rates in the Solomon Islands. The region’s gross investment during this period averaged 21 percent of GDP.

Thus, the performance of the PICs in the past two decades has been characterized by low and extremely volatile growth rates, but on a generally flat trend, leaving per capita income for the group relatively unchanged. Despite high rates of investment, there was neither sustained growth nor significant expansion in the formal sector employment. Questions may be posed therefore as to what accounts for this poor performance of the PICs? In order to explore the underlying factors for this poor performance, it is necessary to examine more closely the macroeconomic policies that the PIC governments adopt in pursuit of their economic goals. These include policies relating to investment and savings, the role of the public sector, external trade, and macroeconomic stability more generally.

\textsuperscript{9} In terms of investment rates, the region is similar to the high-performing East Asian countries but, unlike these countries, investment efficiency appears to be very low.
Investment and Savings

As mentioned above, a notable feature of the PICs' development experience has been the coexistence of low growth with high investment. During the
period 1980-92, the average gross investment rate was 28.5 percent, while average real GDP growth was 2 percent. Gross domestic savings have in most cases been lower than investment, with the gap filled by a current account surplus or by foreign aid and remittances. The low rates of domestic savings in the PICs reflect a high propensity to consume, shallowness of the financial systems, and the narrowness of the monetized part of the economy.

Table 2.1 below sets out the distribution of gross domestic investment in the selected PICs for the period 1983-93.

<table>
<thead>
<tr>
<th>Country</th>
<th>Real GDP Growth Rate (Av. % p.a.)</th>
<th>Gross Investment/GDP (Av. % p.a.)</th>
<th>Private Investment/GDP (Av. % p.a.)</th>
<th>Public Investment/GDP (Av. % p.a.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>2.4</td>
<td>18.1</td>
<td>9.2</td>
<td>8.9</td>
</tr>
<tr>
<td>FSM</td>
<td>0.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kiribati</td>
<td>0.8</td>
<td>31.0</td>
<td>12.0</td>
<td>19.0</td>
</tr>
<tr>
<td>Marshall Islands</td>
<td>0.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>3.2</td>
<td>30.7</td>
<td>15.1</td>
<td>15.6</td>
</tr>
<tr>
<td>Tonga</td>
<td>2.1</td>
<td>30.0</td>
<td>10.4</td>
<td>19.6</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>2.8</td>
<td>32.4</td>
<td>20.4</td>
<td>12.0</td>
</tr>
<tr>
<td>Western Samoa</td>
<td>1.0</td>
<td>32.1</td>
<td>5.6</td>
<td>26.5</td>
</tr>
<tr>
<td>Average PMC's</td>
<td>2.1</td>
<td>28.5</td>
<td>11.5</td>
<td>17.0</td>
</tr>
</tbody>
</table>


As can be seen, public investment tends to dominate in the PICs, which may explain its low productivity (i.e., in so far as these public investments are made in unproductive activities, or the quality of investment is poor, or there is "leakage" in the form of corruption). Average public investment rates are around 17 percent while average private investment rates are around 11.5 percent. However, individual PICs vary greatly in the relative importance of public and private investment. For instance, in Samoa, Kiribati and Tonga, public investment has tended to be much higher than private investment, whereas in Fiji and Solomon Islands, the two have been roughly equal. In Vanuatu until very recently, private investment has tended to dominate. This pattern of public versus private investment shows an interesting relationship to the
pattern of growth: where public investment has tended to dominate, growth has been lower. For example, Samoa and Kiribati have had the lowest average growth rates among the PICs, whereas the Solomon Islands and Vanuatu have had the highest.

One distinguishing feature of public investment in the PICs is that a large part of it has been in low return areas such as public buildings, and this may help explain why investment efficiency had been very low. The investment of public funds in loss-making business enterprises has also contributed to this outcome. For some countries such as Fiji and PNG, the policy environment including distortions in trade and tax regimes has tended to support high-cost, uncompetitive investments.

Thus, the main problem in the PICs appears to be not an acute lack of capital or low investment rates but rather it is the manner in which public capital is invested which tends to lower the productivity of investment and hence its contribution to the growth of the PICs.

The Public Sector

The fact that public investment tends to dominate gross domestic investment is in itself reflective of the size of the public sector in the PICs, and hence of the policy stance of the PIC governments on the role of the public sector in the economy. The PICs are characterized by relatively large governments in terms of both their contribution to GDP and the share of formal sector employment accounted for by the public sector, as is shown in Table 2.2 below. For the period 1985-89, government expenditure as a percentage of GDP ranges between 85 percent for Kiribati and 28 percent for Fiji. For the period 1990-95, the range is from 101 percent to 28 percent. Government employment accounts for nearly 30 percent of total formal employment in Fiji and Solomon Islands and about 50 percent in Kiribati for the period 1996-98.
The generous flows of foreign aid, which have been used mainly for public sector projects, have primarily been responsible for the bloated size of the public sector in the PICs.

Table 2.2: PMC Government Resources, Expenditure, Deficits and Growth (in percent of GDP)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Kiribati</td>
<td>84.6</td>
<td>100.6</td>
<td>79.4</td>
<td>39.3</td>
<td>17.8</td>
</tr>
<tr>
<td>Marshall Islands</td>
<td>62.1</td>
<td>98.1</td>
<td>31.8</td>
<td>55.2</td>
<td>-11.9</td>
</tr>
<tr>
<td>FSM</td>
<td>83.0</td>
<td>89.8</td>
<td>29.7</td>
<td>59.7</td>
<td>-2.0</td>
</tr>
<tr>
<td>Samoa</td>
<td>52.5</td>
<td>70.1</td>
<td>41.8</td>
<td>13.4</td>
<td>-11.8</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>38.7</td>
<td>53.1</td>
<td>28.9</td>
<td>14.6</td>
<td>-7.4</td>
</tr>
<tr>
<td>Tonga</td>
<td>45.8</td>
<td>43.4</td>
<td>26.3</td>
<td>14.6</td>
<td>-3.8</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>53.9</td>
<td>39.4</td>
<td>23.8</td>
<td>14.6</td>
<td>-3.5</td>
</tr>
<tr>
<td>Fiji</td>
<td>28.0</td>
<td>28.4</td>
<td>26.5</td>
<td>0.3</td>
<td>-1.6</td>
</tr>
</tbody>
</table>


Apart from the generous flows of foreign aid, a factor with a direct bearing on the size of the public sector in the PIC economies is the highly interventionist approach with which the governments manage the economy. In virtually all of the PICs, the government sector engages in a wide range of economic activities such as utilities, development finance, commercial credit, overseas trade, marketing of agricultural goods, fishing fleets, mines, plantations, aviation services and hotels. These economic activities are within the province of the private sector, and could have been more effectively carried out by the private sector. It is not surprising, therefore, that the role of the private sector in the PICs has been relatively small. Under these circumstances, it is difficult for the private sector to find and exploit new sources of growth when the public sector has already established footholds in the key commercial segments of the economy. However, a key question of causality does arise. Is the private sector small because of ‘crowding-out’ by government activity, or
are there constraints limiting private sector activities that lead to government taking a larger role than would otherwise be the case? Evidence tends to support the former.

While the range of activities carried out by the government is wide, it is not matched by the requisite technical and managerial resources. As a result, limited skills are spread thinly. Governments have responded to this situation by overstaffing agencies with partially qualified personnel, spending heavily on overseas training, and relying on overseas technical assistance to fill gaps.

The PIC governments are increasingly aware that state-led growth, based upon high levels of public investment and financed with aid flows, has not produced rapid increases in per capita incomes. In recognition of these problems, governments have initiated strategies to improve the effectiveness of government activities – emphasizing strategies for economic reform that would strengthen service delivery, improve the welfare of low income groups, and enhance the capacity of the private sector to generate sustained economic growth. However, these initiatives have yet to be backed up by real actions on the ground.

Trade Policy

The significance of trade in the PICs varies widely. Because of their structural and resource characteristics, PICs produce a relatively narrow range of goods and services but they consume a wide range. For some PICs, merchandise imports are a multiple of exports, implying large merchandise deficits. In Kiribati, for example, the share of imports in GDP in 1996 was nearly 70 percent compared with 8 percent in Tonga. Exports are generally low, around 10 percent of GDP. Invisible earnings reduce the gap in most countries. For instance, tourism earnings are important for Fiji, Vanuatu, Tonga and Samoa; investment income for Kiribati; and remittances from
nationals working abroad in the case of Kiribati, Tonga, Vanuatu and Samoa. Despite these flows, a large gap remains that is met through aid. While isolation from major markets could explain the low trade shares and also the composition of trade, it does not explain the imbalances between imports and exports. Just as isolation makes it difficult to export, so also does it make it difficult to import.

Exports have been mainly confined to primary commodities with a high degree of concentration on a single commodity. This renders the PICs highly vulnerable to external shocks due to world price fluctuations and natural disasters. Over recent years, some countries have begun to diversify by moving towards high value added products by finding niche markets. Fiji moved into the manufacturing sector by exporting garments, others diversified within primary commodities – squash in Tonga, logging in the Solomon Islands, and seaweed in Kiribati.

Trade policy in the PICs has been built around a number of preferential trading arrangements. Most, if not all, of the PICs receive GSP treatment which accords them the lowest duties on offer for products exported to OECD countries. Many are signatories to the Lome Convention that, in addition to development assistance, extends them duty free access for most products to European Union markets. For instance, Fiji has an export quota of 200,000 tons of sugar in the European Union. In the last decade, Fiji’s total sugar exports have been at preferential prices which were 2 to 4 times the world market price. The tuna fishing industries of Fiji and Solomon Islands have also relied heavily on Lome preferences. Within the South Pacific, PICs are provided duty free access to Australia and New Zealand under the South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA). This preferential market arrangement has been very important for the development of garments and footwear in Fiji and automotive wire harness as in Samoa.
Macroeconomic Policy and Performance

A common weakness among most, if not all, of the PICs - though with varying degrees of seriousness - is macroeconomic instability. While most PICs have aimed for a stable macroeconomic regime and a consistent, non-distortionary approach to all economic policies, the outcomes have not always been positive. Several PICs have experienced budgetary crises. Large fiscal deficits were experienced in Fiji, the Federated States of Micronesia (FSM), the Marshall Islands and the Solomon Islands during the period 1990-95. Their fiscal position worsened in 1995-96. The PICs recorded an average inflation rate of 5.4 percent which was double the world inflation rate during the same period. The overall effect has been a weakening of currencies in countries that have their own currencies. The combined effect of fiscal slippage and high inflation rates is the risk of macroeconomic instability, which the PIC governments need to address.

The financing of budget deficits has posed considerable problems in the recent past, especially in a global environment of high capital mobility. For example, the 1994 fiscal crisis in Papua New Guinea resulted in a substantial increase in capital flight and the loss of confidence by commercial banks in the sustainability of budget deficits. For the same reasons, the securities market in the Solomon Islands has shown reluctance to purchase government bonds.

Thus, the lack of fiscal discipline appears to be the main reason for this macroeconomic instability problem amongst the PICs. Given the preponderance of the government sector in these economies, fiscal policy is the main instrument of macroeconomic management of the PIC governments. Monetary policy is almost virtually impotent - its application being limited by structural and institutional constraints which include the existence of a large non-monetary sector, the rudimentary stage of capital markets which hinders smooth financial intermediation, a
shortage of monetary instruments to implement policies, and high consumption propensities that limit the savings flowing into the financial system. Still, central banks in some PICs have been playing a very useful role in preventing the economic situation from becoming even worse, as exemplified by the monetary discipline of the Central Bank of the Solomon Islands in the 1990s.

IV  COMPARATIVE PERFORMANCE

For comparison purposes, it is of interest to benchmark the growth performance of the PICs against the performance of a group of countries or regions of comparable standing. This may facilitate a better informed analysis of the complex issues behind the growth performance of the PICs, and of what lessons the PICs could draw from the development experiences of the more successful small island states elsewhere. For this purpose the Caribbean and Indian Ocean Island states are chosen, mainly because of the work that has already been carried out in this area by Fairbairn and De Lisle (1995). The findings of this study are summarized in Table 2.3 below.

Table 2.3: Small Island States: Average Growth Performance, 1983-93 (percent per annum)

<table>
<thead>
<tr>
<th></th>
<th>Pacific Islands</th>
<th>Caribbean</th>
<th>Africa and Indian Ocean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP</td>
<td>2.2</td>
<td>3.2</td>
<td>5.4</td>
</tr>
<tr>
<td>Population</td>
<td>1.7</td>
<td>0.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Per Capita Real GDP</td>
<td>0.5</td>
<td>2.3</td>
<td>3.4</td>
</tr>
</tbody>
</table>

The Fairbairn-De Lisle study shows that the economic achievements of the Caribbean countries have generally been superior to those attained by the Pacific island countries. Particularly from the mid 1980s, the Caribbean countries grew at a faster pace than the Pacific islands, although the gap appears to have narrowed considerably over the past few years. For instance, over the 1983-1993 period, the annual growth rate of real GDP recorded by the selected Caribbean countries was at least 1 percent above the comparable rate for the Pacific islands. The growth differential is sharper when real aggregate GDP figures are adjusted for relative population growth.

In addition, the report shows that the level of per capita income in the Caribbean countries is around 2.3 times the average for the Pacific countries. Specifically, in 1993, the level was US $3,700 against US $1,600. Such per capita levels place the Caribbean region in the middle developing category, and the Pacific islands in the upper range of low-income developing countries, suggesting significant disparities in living standards and welfare. (The differences with African and Indian Ocean states are even starker). Social indicators of health and educational standards are also decidedly superior in the Caribbean, African and Indian Ocean states.¹⁰

The intriguing question that may be raised then is what accounts for the disparity between the Caribbean/Indian Ocean states and Pacific countries in terms of growth performance and development, given their relative similarity in terms of the constraints they face as small island states?¹¹ The Fairbairn-De Lisle report did not attempt to define the underlying reasons for the superior performance of the Caribbean countries but, in an earlier report by the World Bank (1991), the

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¹⁰ The Fairbairn – DeLisle report did not specify what African/Indian Ocean island countries were referred to, but it must have included Mauritius, Seychelles and the Maldives.

¹¹ As reported by the World Bank (1991), such a disparity in economic performance was unjustified given that the PICs did not face a sufficiently adverse external environment to account for their weak economic performance during the period, i.e. vis-a-vis the Caribbean/Indian island countries.
advantages arising from proximity to the high-income North American markets was highlighted.

V DOES SMALLNESS MATTER?

If there is one fundamental point that the comparison between the PICs and the Caribbean/Indian countries demonstrates, it is that small size and limited natural resources are not necessarily insurmountable obstacles to economic growth and development. The performance of the Caribbean/Indian island countries has defied these ‘smallness’ constraints. Furthermore, if smallness and limited natural resource endowments are indeed the real constraining factors on economic growth and development, why is it that small countries like Singapore and Hongkong have performed so successfully despite these constraints?

A number of empirical studies (e.g., Armstrong et al, 1998, and Easterly and Kraay, 1999) have challenged the validity of this ‘smallness’ concept, arguing that small size is not a systematic barrier to economic performance. More interestingly, these studies find that, controlling for location, small states tend to perform better than other states. Nor do they have different per capita growth rates than other states. The conclusion of the study (Easterly and Kraay, 1999) was that small states were no different from large states and so should adopt the same policies that large states do. These controversial findings raise deep questions about the relevance of the structural and natural resources constraints facing the small island states, and raise the need to investigate whether other factors play a more significant role in the growth performance of these economies.
VI WHAT HAVE THE PICs DONE WRONG?

If smallness, with its associated constraints, is not a real threat to growth, then the search for possible explanations of the poor economic performance of the PICs over the past two decades becomes a much simpler exercise. It reduces to the problem of identifying only those other key major factors that may have been largely accountable for the dismal performance of these economies during the period in question. But what are these factors?

According to the 1991 World Bank Country Report, the PICs performed poorly during the past decades largely because of the ineffective policies that they adopted, particularly in relation to their growth strategy. But are good policies *per se* sufficient for the economic growth and development of the PICs? As argued strongly in this study, good economic policies are of little value unless they are executed within an effective and supportive institutional environment. This point is underscored by Yusuf and Peters (1985) in their comment in relation to the economic performance of Samoa when they said “to the structural and economic causes of slow growth must be added social, cultural and institutional impediments”.

The central proposition of this study is that the PICs performed poorly in the past two decades not only because of the ineffective policies that they adopted but, more fundamentally, because of the lack of workable and supportive institutions. But if institutions are key to development, the logical questions to raise are: what does the term cover, and what actions can be taken to encourage the development of appropriate institutions in the PICs? These questions are addressed in the ensuing chapters.
CHAPTER 3

GROWTH THEORY

Introduction

Economic growth theory as a formal theory in its own right within mainstream economics is relatively young. However, it is currently one of the most controversial and highly researched topics. The bulk of the studies in this area focus on trying to unravel the underlying causes of economic growth and to account for the differences in growth rates across countries and within countries over time. The stream of research on the topic points to the fact that there has not, as yet, been a fully plausible growth theory that adequately accounts for the growth process. This chapter provides a comprehensive overview of the literature relating to growth theory with a view to laying a theoretical basis for the analysis of the role of institutions, or the qualities thereof, in the growth process. It also lays a theoretical framework for the development of a model pertaining to corruption, which is provided in Chapter 6.

The organization of the chapter is as follows: the next section, Section II, reviews the growth models, with special emphasis on the neoclassical and endogenous growth models. Section III compares these two main growth models, as well as highlighting their applicability in the context of the PICs – the countries on which the present study focuses. Finally, Section IV evaluates the contributions of the neoclassical and endogenous growth models in the analysis of the importance of institutions and policies in the growth process, highlighting the institutional underpinnings of economic growth that provides the framework within which this study is situated.
There have been three waves of interest in growth theory during the past 50 years. The first was associated with the work of Harrod (1948) and Domar (1947). The second wave was the development of the neoclassical model by Solow (1956) and Swan (1956), and its variants: the Ramsey growth model developed by Cass (1965) and Koopmans (1965), and the overlapping-generations growth model developed by Diamond (1965) and Blanchard (1988). The third wave came in the form of the so-called “endogenous growth” theories, triggered by the work of Romer (1986) and Lucas (1988). These latter models were, and are still being, developed as a reaction to the perceived shortcomings of the neoclassical growth model as discussed below.

The Harrod-Domar Growth Model

The Harrod-Domar growth model is a long-run growth model based on a fixed-coefficient production function, implying the lack of substitutability between capital and labor in production. Within this model, the equilibrium condition for growth - in which both labor and capital are fully employed - is for the “natural” growth rate (the rate of population growth plus the rate of growth of technical progress) to equal the “warranted” growth rate, defined as the rate that induces just enough investment to match planned savings and hence make capital fully employed. If the natural growth rate exceeds the warranted growth rate, there will be increasing unemployment of labor, violating the initial equilibrium condition. The reverse will put the economy into a situation where there is excess capital, driving the marginal productivity of capital to zero, discouraging investment, and throwing the economy
out of equilibrium. Thus, the critical question of balance for this model boils down to a comparison between the natural growth rate and the warranted growth rate. But since the underlying parameters (the population and technology growth rates, the saving rate, etc.) for these growth rates are independently determined and fixed by assumption, the equality between these growth rates would be a mere coincidence, and equilibrium may never be achieved. It is for this very reason that the Harrod-Domar condition has been characterized as a “knife-edged” case, and which led to its lack of adoption as a useful tool for analysis of the growth process.

The Neoclassical Growth Model

(a) The Solow-Swan Growth Model

The Solow-Swan growth model, which is the cornerstone of what is more appropriately referred to as the neoclassical growth model, was an attempt to resolve the Harrod-Domar shortcoming and to develop a more robust analytical tool for equilibrium analysis of the growth process. The model retains all of the basic assumptions of the Harrod-Domar growth model, except that of fixed proportions in factor use. The key innovation of the Solow-Swan model is that it allows for the possibility of perfect substitution between labor and capital as input factors in production. By changing the production function to allow substitution between capital and labor, the knife-edged notion of unstable balance no longer holds, and a steady-state equilibrium could now be unambiguously determined. Described below are the mechanics of the basic Solow-Swan model and its variants – the Ramsey and the overlapping-generations growth models.

The basis of the Solow-Swan model is the production function
\[ Y = F(K, AL) \]  

where \( Y \) is output, \( L \) is labour, and \( A \) is a measure of the level of technology. \( AL \) can be seen as the labour force measured in “efficiency units”, which incorporates both the amount of labour and the productivity of labour as determined by the available technology. It is assumed that labour and technology grow at constant rates:

\[ \dot{L}(t) = nL(t) \]  
\[ \dot{A}(t) = \mu A(t) \]

where \( n \) and \( \mu \) are exogenous parameters. These latter two expressions imply that the labor force and technology grow exponentially. Note that technological progress enters the equation in a labour-augmenting form. This is so because only labour-augmenting technological change turns out to be consistent with the existence of a balanced growth path. (Refer to Barro and Sala-I-Martin 1995 pages 54-5, for a rigorous proof of this proposition).

As with its predecessor, the Solow-Swan model assumes a fixed saving rate and constant returns to scale in the two arguments of the production function (1).\(^{12}\) In addition, it is assumed that the production function satisfies the Inada conditions as follows:

\[ \lim_{K \to 0} F_K = \lim_{L \to 0} F_L = \infty \]

\(^{12}\) Note that the assumption of constant returns to scale is not necessary for the working of the model – the model can get along perfectly well without constant returns to scale. The assumption is a complete simplification, both because it saves a dimension by allowing the whole analysis to be constructed in terms of ratios and because it permits the further simplification that the basic market form is competitive.
\[ \lim_{K \to \infty} F_K = \lim_{L \to \infty} F_L = 0 \]  

These properties imply that

\[ F(K,0) = F(0,L) = 0 \]  

Conditions (4) and (5) state that the marginal product of capital (labour) is very large when the capital stock (labour force) is sufficiently small, and it becomes very small as the capital stock (labour force) becomes large. The basic role of these conditions is to ensure that the path of the economy does not diverge.

With constant returns to scale, we can write the production function (3) in per effective worker terms, expressing output per unit of effective labour as a function of capital per unit of effective labour:

\[ y = f(k) \]  

where \( y = Y/AL, k = K/AL \) and \( f(k) = F(k,1) \). The Solow-Swan model emphasizes how the production function and the three factors evolve over time, and their implications for growth. The change in capital stock over time is given by the following expression:

\[ \dot{K} = I - \delta K = sF(K,AL) - \delta K \]
where \( I \) is gross investment which is equal to the proportion of output saved (for this closed economy), and capital depreciates at the constant rate \( \delta \). Using equations (2) and (3), it is straightforward to re-write (8) in per effective worker terms as follows:

\[
\dot{k} = sf(k) - (n + \mu + \delta)k
\]  

This is the fundamental differential equation of motion of the Solow-Swan model in per effective worker terms. It says that the change in capital per effective worker is equal to the difference between the savings per effective worker and the amount of investment required to keep the capital-labour ratio constant.

The Solow-Swan model predicts that consequent on the effects of diminishing returns and the Inada conditions, the economy converges asymptotically to a steady state at which all per capita variables - \( k, c, \) and \( y \) - grow at a constant rate determined by the rate of technological progress, \( \mu \). The constancy of the rate at which the per capita variables grow in the steady state implies that the level variables - \( Y, C, \) and \( K \) - all grow at the rate equal to the population growth rate plus the technological rate of growth \((n + \mu)\) in the steady state.

The important results from the Solow-Swan model can thus be summarized as follows. First, if technology and labour supply are fixed, the steady state growth rate is zero. That is, growth is driven entirely by these exogenous variables. Second, if one of either population or technology shows positive growth, the steady-state growth rate of the economy is proportional to the growth rate of that variable; if both are positive, the economy’s growth rate is a weighted average of the two. Third, the steady-state growth rate does not depend on either the level of savings or investment. This means that higher savings and hence investment will only show up in a higher level of
output; it will not affect the steady-state growth rate. In other words, changes in the level of savings or investment will only have level effects, not growth effects. By implication, the per capita growth rate is also independent of the policy changes or anything other than technical progress.

The broad economic message of the Solow-Swan growth model, therefore, is that steady growth is possible in a purely competitive economy provided there is technical progress. However, since technical change itself is an exogenous variable in this model, representing a large part of measured growth (Solow, 1957; Denison 1985), this means that a large part of economic growth remains unexplained in this model. This is why the Solow-Swan model is often seen as a model that leaves the main factor in economic growth unexplained. That is, the model unravels the mystery of economic growth simply by assuming that there is economic growth – treating growth like manna from heaven. This is the major defect of the Solow-Swan model which led to heightened interest in re-examining the growth process, culminating in the development of the so-called endogenous growth models.

Before considering the endogenous growth models, it is necessary to review the variants of the Solow-Swan growth model, namely, the Ramsey growth model developed by Cass and Koopmans (1965), and the overlapping-generations growth model developed by Diamond (1965) and Blanchard (1985). Indeed, any discussion of the neoclassical growth model is not complete without consideration of these important variants of the model.

(b) Utility Optimization Neoclassical Models

One shortcoming of the Solow-Swan model is its treatment of the savings rate as being fixed and exogenously determined, while all other variables are determined in competitive markets. While both the Ramsey and the overlapping-generations
growth models retain all of the working assumptions of the Solow-Swan model, they make an important departure by treating the savings rate as no longer constant but, instead, is determined by optimizing households and firms interacting in competitive markets. However, such modification adds little, if anything, to the fundamental results of the basic model, as is demonstrated later.

Let's consider first the Ramsey version. In this optimizing framework, the households choose a consumption path that is consistent with their intertemporal budget constraint, the dynamics of the capital stock, and the transversality condition. As will become clearer later, consumption per capita determines the path of the economy.

Suppose the household’s consumption preferences are represented by the following instantaneous utility function:

$$U(t) = \int_0^\infty e^{-\beta t} \frac{c(t)^{1-\theta}}{1-\theta} dt$$

subject to

$$\dot{k}(t) = f(k) - c(t) - (n + \mu + \delta)k$$

where $\theta$ determines the household’s willingness to shift consumption between periods. In other words, $\theta$ is the elasticity of marginal utility with respect to consumption. The smaller is this parameter, the more slowly marginal utility falls as consumption rises, and so the more willing the household is to allow its consumption to vary over time. The assumption that $\beta = \rho - n - (1-\theta)\mu > 0$ ensures that lifetime utility is bounded. This follows essentially from the transversality condition,
which requires \( f'(k) - \delta \), the steady-state rate of return, to exceed \( \mu + n \), the steady-state growth rate of \( K \).

The central planner’s task then is to maximize the representative family’s welfare, given its preferences in (12) and subject to the constraint in (13). The only choice that has to be made at each moment of time is how much the representative family should consume and how much it should add to the capital stock to provide consumption in the future.

The solution to this maximization problem is obtained by forming the current-valued Hamiltonian and deriving the dynamic first-order necessary conditions. From these first-order conditions, the two key differential equations are derived as follows:

\[
\frac{\dot{c}}{c} = \frac{1}{\theta} \left( f'(k) - \delta - \rho - \theta \mu \right) \tag{15}
\]

\[
\dot{k}(t) = f(k) - c(t) - (n + \mu + \delta)k \tag{16}
\]

Equations (15) and (16) form a system of two differential equations in \( c \) and \( k \). Together with the initial condition \( k(0) \), and the transversality condition (14), they determine the time paths of \( c \) and \( k \). Equation (15) is the Euler equation which must be satisfied on any optimal path. It is the continuous time analogue of the standard efficiency condition that the marginal rate of substitution be equal to the marginal rate of transformation. The equation implies that consumption per worker is rising if the real rate of return exceeds the rate at which the household discounts future consumption, and is falling if the reverse holds. At steady state \( \dot{c} = 0 \), implying that
\[ f'(k) - \delta = \rho + \theta \mu \] (i.e., the effective real rate of interest equals its steady-state value), so that consumption per worker is constant in the steady state.

Equation (16) is the key relation that determines the evolution of \( k \) and, hence, \( y \), over time. It says that a change in the capital stock per worker equals output less consumption and depreciation per worker.

The behavior of the economy once it has converged to the steady state is identical to the Solow-Swan economy in the steady state. At this point, capital, output and consumption per unit of effective labour are constant. By implication, the savings rate is also constant in the steady state, given that \( y \) and \( c \) are constant at that point. Thus, as in the Solow-Swan model, the per capita variables - \( c, k \) and \( y \) - grow at a constant rate which is pegged at the exogenously-determined rate of technical progress, \( \mu \), while the level variables - \( K, C \) and \( Y \) - grow at the rate \( n + \mu \) (i.e., the sum of the population and technological growth rates).

Thus, although the Ramsey model took the important step of endogenizing the savings rate, this does not affect the Solow-Swan model's crucial result that growth in the effectiveness of labor remains the only source of persistent growth in output per worker. An intuitive explanation for this is that although the savings rate may rise during the transition, it cannot rise enough to completely eliminate or offset the effects of diminishing returns to capital. So once again, the growth rate per capita relapses to the steady-state growth rate, which is determined by the rate of technological progress. The only significant change that the Ramsey growth model makes to the basic model is that the savings rate now follows a complicated path which may affect the speed of convergence to the steady state, depending on whether the savings rate rises or falls with \( k \).
The second variant of the Solow-Swan growth model is the overlapping-generations growth (OLG) model. We do not discuss the OLG model in detail here since it is, in essence, similar to the Ramsey growth model, apart from a few minor structural differences. What follows is a discussion of the basic structure of the model and its implications for the growth process.

The central difference between the OLG model and the Ramsey infinite-horizon model discussed above is that there is a turnover in the population. That is, rather than there being a fixed number of infinitely-lived households, new individuals are continually being born, and old individuals are continually dying. With turnover, time is now treated as discrete rather than continuous.

The model works as follows: each individual lives for only two periods. People work in the first period when they are young, and retire in the second period when they are old, and then die off. Therefore, during period $t$ the young of generation $t$ overlap with the old of generation $t-1$. Each person maximizes lifetime utility, which depends on consumption in the two periods. The crucial assumption is that people do not care about events after their death, i.e., they are not altruistic towards their children. On the production side, the capital of the old and the labour supplied by the young are combined to produce output in period 0.

The equilibrium properties of the model are similar to those of the Solow-Swan and the Ramsey models in the steady state, namely that the savings rate is constant, output per worker is growing at the rate $\mu$, the capital-output ratio is constant, etc. However, the model does no better than the Solow-Swan and Ramsey models in explaining the growth process. Because of the Inada conditions, $k_{t+1}$ cannot exceed $k_t$, for $k_t$ sufficiently large. That is, the marginal product of capital approaches zero as $k_t$ becomes large so that $k_{t+1}$ is eventually less than $k_t$. This
implies that unbounded growth of \( k \) is not possible. Thus, once again, growth in the effectiveness of labour is the only potential source of long-run growth in output per worker, as in the Solow-Swan and Ramsey growth models.

**The Endogenous Growth Models**

Although the neoclassical growth models provide interesting frameworks for studying transitional dynamics, they are not helpful in understanding long-term per capita growth. In the first place, by ascribing economic growth entirely to technological progress - a phenomenon determined outside the models - they undermine the role of other factors that may play an equally important, and perhaps more convincing, role in the growth process. Secondly, the predictions of these models, in particular those relating to their depiction of a stable steady state, bear no resemblance to empirical data. For instance, in the real world, profits, investments and growth rates have exhibited long-term accelerations and decelerations, tending neither asymptotically to approach such a steady state nor even to progress smoothly along a trend provided by technical progress.

The endogenous growth models, inspired by the seminal work of Romer (1986) and Lucas (1988), attempt to get around these shortcomings of the neoclassical growth models by asserting that long-run growth is possible without technological progress (and even in the presence of diminishing returns). The common approach employed by these models is to eliminate the long-run tendency for capital to experience diminishing returns, by either adopting a broad concept of capital or introducing externalities into the models, or both. The key element of these new growth theories is that the long-run rate of growth depends on a host of supply-side determinants such as learning by doing or watching (Romer, 1986; King & Robson
1996), intentional investment in human capital (Lucas, 1988), research and
development (Romer, 1990; Grossman & Helpman 1990, 1991; and Aghion & Howitt
1992), and public infrastructure and other public goods (Barro 1990; Barro & Sala-i-
Martin 1992). Most of these new growth models follow the lead of earlier work by
Nordhause (1969) and Shell (1973) built the first models in which technological
change occurred as a result of deliberate economic choices.

The literature on the endogenous growth models is far-reaching and it will be
helpful, for ease of analysis and discussion, to classify these models into two broad
variants, namely, the “broad capital” and “endogenous innovation” variants. The
distinguishing line between these two variants is that for the first variant technical
change does not play a crucial role, whereas for the latter it does. Only in the latter
variant is the focus firmly on the incentive structure relating to the special nature of
innovative activity.

(a) The Broad Capital Variant

The models developed by Rebelo (1991), Romer (1986, 1990), Lucas (1988),
Barro (1990), and Barro & Sala-I-Martin (1992) may be classified under this
category. While these models have the common property of assuming constant (or
increasing) returns to the broad capital, the ways in which they derive their results
vary.

The AK model, which forms the basis of the Rebelo model, represents the
simplest class of the endogenous growth models. The key feature of this model, which
diffsers from the standard neoclassical growth model, is that production is linear in
capital. Expressed in per worker terms:
where \( k \) is capital per worker, broadly defined to include both physical and human capital. This differs fundamentally from the neoclassical production function in that the marginal product of capital is not diminishing (\( f'' = 0 \)) and the Inada conditions are violated – in particular, that \( f'(k) = A \), i.e., the marginal product of capital per worker asymptotically approaches a constant value \( A \) as \( k \) goes to infinity or zero.

Employing the setup as in the Ramsey growth model, the social planner’s task is to maximize

\[
U(t) = \int_0^\infty e^{-\rho t} \frac{c(t)^{1-\theta}}{1-\theta} dt
\]

Subject to the accumulation equation

\[
\dot{k}(t) = Ak - c - \delta k
\]

The solution is obtained by the familiar route of forming the current-valued Hamiltonian, deriving the first-order conditions, and solving for the steady state subject to the transversality conditions. This would yield the following result, which says that the variables have constant steady-state growth rates:

\[
\frac{\dot{y}}{y} = \frac{\dot{k}}{k} = \frac{\dot{c}}{c} = \frac{1}{\theta} (A - \rho - \delta)
\]

Note that these growth rates apply at every point of time and thus the economy is at all times in the steady state. That is, the model has no transitional dynamics. The distinctive feature of the AK model vis-à-vis the neoclassical model thus is that
changes in the underlying parameters - $A$, $\rho$ and $\theta$ - affect both the levels and growth rates $c$ and $k$. In short, under this model, sustained growth is possible without technological progress as long as the long-run tendency for capital to experience diminishing returns can be eliminated, which is possible if one adopts a broad concept of capital that includes physical and human capital.

Like the AK model discussed above, the Romer (1986), Lucas (1988) and Barro-Sala-I-Martin models (1992) are predicated on the concept of broad capital, but differ in that they incorporate explicitly the externality effects into the production function. Some authors prefer to classify these models as externality models.

The analysis of Romer resembles the work of Arrow (1962) but extends it by enlarging the concept of capital and considers not only the accumulation of capital goods but also investment in knowledge. Note that the emphasis here is on the side effects of knowledge rather than the intentional accumulation of knowledge. Externalities arise from the fact that capital accumulation generates experience and learning which, in turn, enhances productivity. These externality benefits, however, cannot be internalized and thus are subject to emulation by other firms, which in turn raises efficiency (productivity) in the economy as a whole.

In the Arrow version, technical progress was viewed as a function of accumulated investment but with elasticity less than one. This resulted in growth being dependent on the expansion of the labour force, a result analogous to that of the standard neoclassical growth model. Romer, on the other hand, makes the learning parameter equal to at least unity, and thereby cuts the link between output and growth. This implies that growth can now proceed indefinitely with capital accumulation even in the presence of a stationary labour force.
A simple version of the Romer model may be illustrated as follows. Suppose there are a large number of firms, \( N \), in the economy, and the supply of labour is fixed inelastically at one worker per firm. Let’s denote the capital stock per worker held by firm \( j \) to be \( k_j \), so that the aggregate capital stock in the economy, \( K \), is

\[
K = \sum_{j=1}^{N} k_j
\]  

(21)

The aggregate capital stock in the economy is taken to represent the stock of human knowledge in the economy and generates externalities with respect to the production possibilities for firm \( j \). This is captured in the firm’s production function \( f(k_j, K) \).

Romer rationalizes this formulation by arguing that if new physical capital and new knowledge are produced in fixed proportions, then \( K \) not only measures the aggregate capital stock but is also an index of the knowledge available to the firm. However, because each firm is small relative to the aggregate, it takes the aggregate capital stock \( K \) as given in choosing \( k_j \).

In order to characterize the solution more explicitly, Romer adopts a specific functional form taking the utility function to be of a logarithmic functional form:

\[
U(c) = \ln c
\]  

(22)

and the production function to be Cobb-Douglas \( F(k, K) = k^{\alpha} K^{\eta} \). It is further assumed that all firms are identical so that \( K = Nk \) and thus the production function is represented by:
\[ F(k, K) = k^{\varepsilon + \eta} N^\eta \] (23)

Or setting \( N = 1 \)

\[ F(k, K) = k^{\varepsilon + \eta} \] (24)

The accumulation equation is:

\[ \dot{k} = k^{\varepsilon + \eta} - c \] (25)

The command economy solution is obtained by maximizing (22) subject to (25), yielding the following Euler equation:

\[ \frac{\dot{c}}{c} = (\varepsilon + \eta)k^{\varepsilon + \mu - 1} - \rho \] (26)

As can be seen from (26), the dynamics depend critically upon whether \( \varepsilon + \mu \) is greater or less than one. If \( \varepsilon + \mu < 1 \), the dynamics are essentially as in the Ramsey model. If \( \varepsilon + \mu > 1 \), the equilibrium will be one of accelerating growth. Note that the steady state growth depends positively upon the productivity of capital and negatively upon the rate of time preference \( \rho \).

A severe limitation of the Romer model is that it depends on a strong assumption about the value of the learning exponent: if it is below one, growth falls back to the Arrow solution; if it is marginally above one, growth accelerates without bounds.
Turning to the Lucas model, the model focuses on the intentional accumulation of knowledge, rather than treating it as a mere by-product of the investment activities of firms. According to this model, human capital can be increased by devoting time to learning, which can only be achieved at the expense of time devoted to work or leisure. As with the above models, the accumulation of human capital is assumed to be subject to constant returns to scale. Like Romer and Arrow, Lucas presupposes that the stock of human capital has a positive external effect on the production of goods, though this is not a necessary assumption for sustainable and endogenous growth.

To set out algebraically the Lucas model, let \( h(t) \) denote the skill level of the representative worker, who divides his non-leisure time in the proportion \( u \) at work and \( (1-u) \) in the process of adding to his human capital. Assume further that the production of human capital is governed by a linear function:

\[
\dot{h}(t) = h(t)\phi(1-u)
\]

where \((1-u)\) is as defined above and \(\phi\) is the maximum growth rate of \(h(t)\). If no effort is devoted to human capital, i.e., \(u = 1\), then \(h(t)\) does not accumulate. On the other hand, if all effort is devoted to this purpose, i.e., \(u = 0\), then \(h(t)\) grows at its maximum rate \(\phi\). In between these extreme values, there are no diminishing returns to the stock \(h(t)\).

The model depicts a somewhat complicated production function, incorporating human capital, \(uhL\), average human capital, \(h_a\), of the labour force, and the externality for average human capital, \(h_a^\psi\), in addition to capital stock, \(K\):
Expressed in per capita terms:

\[ y = BK^\beta (uhL)^{1-\beta} h_a^\psi \]  

(29)

The capital accumulation equation is

\[ \dot{k} = Bk^\beta (uh)^{1-\beta} h_a^\psi - c \]  

(30)

The steady-state solution is found by maximizing the standard utility function subject to (22) and (25), and the appropriate transversality conditions, with \( h_a = h \) treated as a constant. This yields a steady-state solution:

\[ \frac{\dot{y}}{y} = \frac{\dot{k}}{k} = \frac{\dot{c}}{c} = \frac{(1 + \psi - \beta) \dot{h}}{1 - \beta \dot{h}} \]  

(31)

It is clear from (26) that the accumulation of human capital drives growth, with the process being modeled by a simple linear relation involving time spent on learning. If there is no externality so that \( \psi = 0 \), all factors can be accumulated and consumption, physical capital and human capital all grow at the same rate in the steady state. This is the same result depicted by the AK model discussed above. If, on the other hand, \( \psi > 0 \), i.e., there is an externality effect, implying that \( \frac{\dot{k}}{k} = \frac{\dot{c}}{c} > \frac{\dot{h}}{h} \), so that the externality effect induces more rapid physical than human capital growth. Notice that the model predicts sustained growth whether or not the externality effect \( \psi \) is positive.
Before leaving the Lucas model, it is worth pointing out that the introduction of human capital into the production function does not necessarily always imply endogenous growth. For instance, human capital can be incorporated in ways which still leave growth exogenously determined, as in the augmented Solow-Swan model developed by Mankiw *et al* (1992).

Other endogenous growth models that may be classified under this broad-capital variant heading are those by Barro (1990) and Barro and Sala-I-Martin (1992), which focus on the endogenous relationship between government expenditure on infrastructure and economic growth. These models exploit the idea that government investments in both material infrastructure (e.g., public highways) and the non-material infrastructure (e.g., education, protection of property rights) are essential to economic growth in the sense that they enhance the productivity of the private sector. Under this assumption, government spending enters into the production function as an externality, which is taken as given, but which influences productivity. Again, as in the preceding models, the idea is that there are constant returns to scale with respect to broad capital of all the firms in the economy as well as the spending on public goods. In short, these models argue that the rate of economic growth is positively related to the national income share of these types of public goods, so that government spending drives steady-state growth.

*(b) The Endogenous Innovation Variant*

This category of models includes Romer (1987, 1990), Grossman and Helpman (1990, 1991); and Aghion and Howitt (1992) – all of which take research and development as central to economic growth. In these models, the output of research and development is seen as blueprints for new products or for better quality
of products. The assumption is that there are constant returns to research and development with externality effects on production.

It is postulated in these models that invention of new products or designs or improvements in the quality of goods benefits both the inventing firms and consumers. For the inventing firm, the invention of a new product/design and/or improvement in the quality of its product places it in at least a temporary monopolistic position with an accompanying stream of profits. Consumers benefit from the production of invented goods in so far as they value variety or quality. Putting these two effects together, these models argue that the growth of the economy corresponds to the growth in the number of varieties or in the quality of consumer and capital goods. Notice that technological progress is now treated as a purely endogenous process, determined within the models by the profit-maximizing activities of the firms. It follows that the government can affect the long-run rate of growth by influencing the scale of resources allocated to the research and development sector.

Putting the Endogenous Growth Models Together

The foregoing discussion shows that the endogenous growth models have many common features. They share the notion that technical progress is not manna from heaven, but is related to economic activity. With the exception of the public infrastructure approach, the accumulation of knowledge is brought to the fore as the driving force behind economic growth. The deliberate search for new and better products or production techniques, the conscious exploration and exploitation of the environment rather than duplication of already existing means, methods and ideas, constitute the basis of technical progress.
The basic economic message from these models is that endogenous steady-state growth can be attained in a competitive framework in the following two cases:

- When there is an externality in production (arising, for example, from learning by doing or from the growth of technology or knowledge) which is carried by the factor of production being accumulated and where there are constant returns to the accumulating factor and to the externality taken together;
- When there are several accumulating factors of production, each with its own accumulation equation, with constant returns to the accumulating factors taken together, and an externality carried by one of them. In this case, the externality will amplify the growth generated by the accumulating factors themselves.

III COMPARING THE GROWTH MODELS

As pointed out earlier, the major shortcoming of the neoclassical growth model is that it leaves the main factor (technical progress) in economic growth unexplained. Moreover, the model ascribes no role at all in the growth process to investment and policy. Both these views are strongly rejected by the proponents of the endogenous growth models, both on theoretical and empirical grounds. As Lucas (1988) says
By assigning so great a role to 'technology' as a source of growth, the theory is obliged to assign correspondingly minor roles to everything else, and so has very little capacity to account for the wide diversity in growth rates that we observe.

Indeed, the development and growth experiences of countries do not accord well with the general predictions of the neoclassical growth models, especially in relation to the convergence hypothesis.

While the endogenous growth approach may, at the theoretical level, appear more plausible, it should be recognized that the empirical evidence relating to these models is at present incomplete and not wholly supportive of the hypothesis that growth is endogenous. More importantly, it remains unclear whether stimulating investment (in a broad sense) will not eventually run into diminishing returns.

Numerous studies have subjected the predictions of the endogenous growth models to empirical scrutiny and come up with unconvincing results. For instance, Oulton and O'Mahony (1994) and Islam (1995) found no evidence to support the hypothesis of substantial externalities to physical capital. This contradicts the result of the much discussed study by De Long and Summers (1991) which claims a significant role for investments in growth. Further, Islam could not find evidence of constant returns to broad capital, suggesting that there are diminishing returns to broad capital.

A study by Jones (1995) finds little empirical evidence to support the hypothesis that total factor productivity is increasing with the level of resources devoted to research and development, as postulated by the research and development models discussed above. In addition, Oulton and Young (1996) find little evidence that education play a significant role in explaining growth. A study by Spiegel (1994) arrived at the same conclusion, but managed to obtain a significant relationship only after he made technical progress a function of the level of human capital stock. The
authors caution, however, that these findings should not be treated as conclusive due to data problems relating to consistency and comparability.

If there is one major shortcoming of the endogenous growth models, it is that they are not readily amenable to empirical testing, and hence their empirical relevance may be difficult to evaluate. The major hurdle to the empirical implementation of these growth models, as is foreshadowed by the results of some of the empirical studies surveyed above, is the difficulty of identifying a specific growth factor (e.g. public investment, human capital, or research and development) and finding measures or proxies for it. As highlighted by the various empirical studies, such measures are not always available both in volume and in the form that is required. Very often, weak proxies are being used, resulting in inconsistent and misleading results.

In the light of the findings of these empirical studies, it may be argued that the endogenous growth models lack robustness with respect to data. The results of these studies do not provide convincing evidence that the endogenous growth models overwhelmingly dominate the neoclassical models, neither in theory nor in terms of empirics. As Solow (1994) himself points out, the endogenous growth models are very unrobust, and simply cannot survive without exactly constant returns to capital. The following statement by Craft (1996) perhaps best describes the relevance of the endogenous growth models at this stage:

It is the spirit rather than the letter of the new growth models which should be taken seriously, since some aspects of the models are less than convincing, and it would be unfortunate if these were taken seriously by policy-makers.

There appears to be a long way, therefore, to go before these new growth models can be used as tools of real value to explain the growth process. If anything,
these new growth models served to stimulate empirical work that demonstrated the explanatory power of the neoclassical growth model.

Before leaving this section, it is important to evaluate the applicability of the two growth models in the context of the PICs - the countries on which this study focuses. With its emphasis on deliberate innovation (technical advance) and knowledge spillover in the production process, the applicability of endogenous growth theory to the PICs would be limited. This is because these countries are primarily agriculture and service economies with relatively small manufacturing sectors, and hence with limited scope for the sort of spillovers captured in the endogenous growth models.¹³ Thus, the PICs would stand to benefit more from development of their own human capital in conjunction with diffusion of foreign technology. However, that is readily accommodated and understood within the simpler framework of the neoclassical growth model.

IV INSTITUTIONS, POLICIES AND ECONOMIC GROWTH

As noted above, the two economic growth models have opposing views regarding the roles that savings rates, government policies and national institutions play in the growth process. According to the neoclassical growth model, changes in savings rates, government policies or institutions affect only the levels of the steady-state output and capital stock but will have no long-run effect on the growth rate. That is, in the long run growth rates would all be anchored to the rate of technical progress. These propositions are at odds with the generally held view that a country can grow
faster if it saves more or if its government pursues better economic policies and growth-enhancing institutional reforms.

While the endogenous growth theory provides the framework in which national economies could achieve perpetual growth per capita, it does not preclude growth rates converging for some countries. More importantly, it also provides a channel for savings propensities, national institutions, and government policies to have permanent growth effects (through their ‘externality’ effects on the accumulable factors of production) rather than merely transitional effects as in the neoclassical model. Moreover, it encourages economists to think more systematically about the underlying determinants of technological change. Finally, it offers a new set of reasons for governments to pursue effective policies to actively promote growth by encouraging resources to move into “high-growth” sectors.

Which model should we follow? If the results of the various empirical studies on the institution growth relationships (e.g., Hall and Jones, 1999; and Knack and Keefer, 1985) were to hold true, the endogenous growth models would be the one to follow. That is, institutions and economic policies affect growth rates. However, this does not necessarily mean that the neoclassical model is of no practical value. It should be noted that, in its simplest form, endogenous growth theory is the neoclassical growth model with an infinite convergence time so that the economy grows forever rather than converging to a steady-state level of output and capital. If the time taken to approach this steady state is relatively long,\textsuperscript{14} then cross-country variation in growth rates may simply reflect variation in transitional growth rates as countries adjust to different steady-state (long-run) levels of income. Such interpretation would not only allow the neoclassical model to account for disparities

\textsuperscript{12} Manufacturing constitutes less than 10 percent of GDP in the PICs. The agriculture and service sectors comprise about 29 percent and 60 percent, respectively.
in rates across countries, it would also allow national savings behavior and institutional and policy parameters to affect growth. For instance, if the economy can achieve higher transitional growth, that is higher growth for more than 60 years, the result will be as good from the viewpoint of current generations as permanently higher growth. Hence, the statement that savings behavior, institutions, and policy cannot affect growth rates in the neoclassical model is only true beyond the lifetime of most individuals currently alive.

Thus, both growth theories are not necessarily in conflict in their assessment of the roles that policy and institutions play in the growth process, if the transitional growth path to steady state is taken to be longer than the lifetime of the current generation. The following simple policy rule is thus in order: “Higher growth should follow if those institutions and government policies are changed that are responsible for a country’s factor productivity and factor growth being low relative to other countries.”

While the above rule is conceptually simple, its implementation is not. The term “institution” is difficult to define and measure, given its abstract and multi-dimensional nature, and hence the difficulty in identifying components of it that are crucial to development, as opposed to those that are not. In this context, the remainder of this study is devoted to discussion of the role of institutions (and government policies) that are of particular relevance to the PICs, and their implications for empirical analysis. As a first step in this direction, the next chapter provides an overview of the literature on the role of institutions in the growth process, highlighting the key conceptual issues and the results of the various empirical studies that have been carried out in this field of study.

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14 Estimated to be about 70 years (Barro and Sala-I-Martin, 1995).
CHAPTER 4

INSTITUTIONS AND ECONOMIC PERFORMANCE

Introduction

Explaining the vast differences in economic performance across countries is one of the formidable challenges to economists. The neoclassical growth-accounting approach ascribes cross-country differences in economic growth to differences in the contributions of physical capital, human capital, and productivity. However, this still leaves open the puzzling questions of why some countries invest more than others in physical and human capital, and why some are more productive than others, given the same or greater levels of investment. Recent studies (e.g., Olson 1996, Rodrik 1997, and Hall and Jones 1999) have challenged the adequacy of the growth-accounting explanation, arguing that neither differences in endowments nor differential access to technology explain much of the variation in per capita incomes across countries. They postulate that the great differences in the wealth of nations are mainly due to differences in the quality of their institutions and economic policies. Implicit in this argument is the notion that the quality of institution is the fundamental determinant of economic growth. The validity of this institutional argument lies in its consistency with the empirical data, and in its ability to explain differentials in the level of capital accumulation and productivity across countries. These issues are considered in this chapter.

The chapter is organized as follows. The next section, Section II, provides a survey of the empirical literature on the role of institutions in the growth process, highlighting the important contributions of the various studies on this important area.
Section III discusses the various measures used by researchers to assess the quality of institutions or governance. Section IV examines the key issues and problems associated with the measurement of these institutional variables. Finally, Section V sums up the discussions.

III INSTITUTIONS AND ECONOMIC GROWTH

The Conceptual Issues

Simply defined, institutions are the rules, including behavioural norms, by which agents interact, and the organizations that implement rules and codes of conduct to achieve desired outcomes (World Bank, 2001). As such, institutions provide the incentives that provoke or prohibit certain actions. For instance, in the context of the public sector, rules and regulations together define the incentive structure of public officials within their organization. Fundamentally then, institutions shape the expectations and actions of agents in the economy, whether they be entrepreneurs or public officials.

Institutions perform three important functions:

- They channel information about market conditions, goods, and participants. Good information flows help entrepreneurs identify partners and high return activities – and assess their creditworthiness. They also help governments regulate well. Institutions falling within this category include accounting firms, credit registries, and government regulations on the freedom of the media.

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15 Institutions should be distinguished from ‘governance’, which is the art of providing effective institutions.
- They define and enforce property rights and contracts, determining who gets what and when. Knowing the rights one has to assets and income and being able to protect those rights are critical for market development, including the right of the private sector in relation to the state. Also important is the availability of the means for effective settlement of disputes and enforcement of property and contractual rights. Examples of such institutions include constitutions, judicial systems, and the full array of social networks.

- They increase competition in markets – or decrease it. Competition gives people incentives to do better, promoting equal opportunity. As such, competition spurs innovation and economic growth. (But some institutions impede competition, e.g., regulations restricting entry of new businesses).

Through these three functions, all institutional structures affect the distribution of assets, incomes, and costs as well as the incentives for market participants and efficiency of market transactions. By distributing rights to the most efficient agent, institutions can enhance productivity and growth. By affecting the incentives to invest, for example, through strengthening property rights, institutions can affect investment levels and adoption of new technology. By delineating market rights, such as through competition law, institutions limit producer rents and protect consumers from high prices. Finally, by clarifying rights for the disadvantaged in markets, institutions can directly affect the lives of poor people. For example, giving formal titles to poor people whose occupancy rights were not recognized by lenders allows them to borrow and invest.

In sum, how these rules are set and applied is crucial for the efficiency and effectiveness of institutions. As noted above, to the extent that institutions affect incentives for investment and innovation, they have the potential to either impede or enhance economic growth.
The Empirics

While at the theoretical level there are divergent views as to the proper role of institutions in the growth process (e.g. between the neoclassical and the endogenous growth schools), at the empirical level the conclusion is almost an absolute unanimity, i.e., that certain institutions are crucial for long-term economic growth and development. The argument is that to the extent that institutions structure individuals’ and firms’ incentives for innovation, production, and exchange, they have the potential to either impede or enhance economic growth. For instance, if the laws and mechanisms of enforcement related to contracts and property rights are not clear, predictable and effective, then factors of production are not likely to be used to their full economic potential. A good illustration, albeit anecdotal, of this point is the case where weak institutions result in lack of law and order. If farmers, for example, cannot be protected from theft, then thievery will be an attractive alternative to farming. A fraction of the labor force will be employed as thieves, making no contribution to output. In like manner, entrepreneurs would be forced to divert their resources towards building fences and other security devices, instead of building factories and producing, resulting in loss of output and productivity.

The surge of interest in the study of the link between the level of institutions or governance and economic performance had intensified in recent years, underpinned by the increasing availability of data measuring the subjective perceptions of the quality of institutions.\(^{17}\) For convenience, it is useful to differentiate these empirical studies according to their focus and depth of analysis on the different aspects of institutions or governance. Firstly, there is a group of researchers who have taken a comprehensive approach in the analysis of the institution-economic relationship, focusing on the wider dimensions of institutions or governance (Knack and Keefer
1995, Mauro 1995, Rodrik 1997, Hall and Jones 1999, Kaufmann et al 1999, and Poirson 1998). Secondly, some researchers have limited their focus to a specific indicator of the level and quality of institutions or governance, such as corruption or security of property rights, and examine the effects of this measure on economic growth and other related growth variables such as investment (Tanzi and Davoodi 1997, Mauro 1998, Clague et al 1999, and Leites and Weidmann 1999). Finally, there are those who have extended the analysis beyond the institution-economic relationships and examined the important question of why some countries have better institutions than others. The main focus of these latter studies is on identifying the key factors accountable for the differences in the level and quality of institutions across countries (La Porta et al 1998, Easterly and Levine 1997, and Hall and Jones 1999).

Different as these studies may be in terms of their focus and approach, they unambiguously converge on the proposition that malfunctioning government institutions severely harm economic growth through a reduction in both incentives and opportunities to invest and innovate.

The study by Knack and Keefer (1995) is one of the pioneering works on this institution-economic relationship, and has been instrumental in the resurgence of interest on this topical issue. Using the institutional indices developed by the Political Risk Group and BERI (as described in Section III below), Knack and Keefer find a significant relationship between the quality of institutions and both the per capita GDP growth rate and private investment across countries. The institutional indicators they focus on are: bureaucratic quality, infrastructure quality, corruption, rule of law, expropriation risk, and repudiation of contracts by government. The major shortcoming of this study is its failure to account for the endogeneity bias and the possible measurement errors relating to the use of proxy measures for institutional

17 Refer to Appendix I for a summary of the selected studies that have recently been undertaken on this area.
performance, and the possible reversed causality effects between institutional and economic performance.

The Knack and Keefer study does not explicitly consider the extent to which the quality of institutions accounts for the differences in the economic performances across countries. This question is taken up in subsequent studies by Rodrik (1997), Jones and Hall (1999), and Kaufmann et al (1999). Rodrik, for instance, finds that institutional quality does exceptionally well in ranking East Asian countries according to their growth performances.\(^{18}\) Likewise, Hall and Jones (HJ) show that differences in capital accumulation, productivity, and therefore output per worker, are fundamentally related to differences in what they term “social infrastructure”, across countries - where social infrastructure is defined as the institutions and government policies that determine the economic environment within which individuals accumulate skills and firms accumulate capital and produce output. Kaufmann et al make an important extension incorporating the link between institutions and development outcomes such as lower infant mortality and higher literacy rates. The empirical approach adopted by Kaufmann et al is essentially the same with that used by Hall and Jones. Because of the relevance of the Hall and Jones model to the empirical part of this study, a brief description of this model is necessary.

Hall and Jones hypothesize the following structural model:

\[
\log \left( \frac{Y}{L} \right) = \alpha + \beta S + \epsilon \tag{1}
\]

and

\[
S = \gamma + \psi \log \left( \frac{Y}{L} \right) + \theta X + \mu \tag{2}
\]

\(^{18}\) This contradicts Helliwell’s (1997) findings which could not establish any significant relationships between differences in institutional quality and the growth differences among the Asian economies. However, Rodrik’s study is based on a small sample of countries and small number of observations, and hence his results must be interpreted with great caution.
where $S$ denotes social infrastructure and $X$ is a collection of other variables. Thus, the model recognizes that social infrastructure is an endogenous variable, i.e., economies are not endowed with the institutions and incentives that make up their economic environment, but rather social infrastructure is determined endogenously. HJ do not, however, estimate equation (2), justifying this on the ground that the determinants of social infrastructure affect output per worker only through social infrastructure and not directly. Accordingly, HJ find it only necessary to estimate equation (1) as modified below, using the instrument-variable estimation technique.

Since the determinants of social infrastructure are correlated with $S$ but uncorrelated with the disturbance term $\varepsilon$, i.e., $EX'\varepsilon = 0$, any subset of the determinants of social infrastructure constitutes a valid instrument.

HJ augment their specification by recognizing that social infrastructure cannot be observed directly. Instead, they observe a proxy variable $\hat{S}$ computed as the sum of the institutional indices provided by Political Risk Services (ICRG) and the Sachs and Warner (1995) openness variable, normalized to a $[0,1]$ scale. This proxy for social infrastructure is related to true social infrastructure $S$ through a random measurement error:

$$\hat{S} = \phi S + \nu$$

where $\nu$ is the measurement error, taken to be uncorrelated with $S$ and $X$. Setting $\phi = 1$, we have

$$S = \hat{S} - \nu$$

Using this measurement equation, we can rewrite equation (1) as
\[
\log\left(\frac{Y}{L}\right) = \alpha + \beta \hat{S} + \hat{e}
\]  

where \( \hat{e} = \varepsilon - \beta v \). This is the empirical specification that Hall and Jones use in their estimation equations. Note that it would be inappropriate to use OLS to estimate equation (5) because \( \varepsilon - \beta v \) is correlated with \( \hat{S} \) and hence is likely to yield biased and inconsistent estimates of the parameters.

As mentioned earlier, some studies examine this relationship from a restricted perspective, focusing only on certain indicators of institutional quality as in Mauro (1995, 1998), Tanzi and Davoodi (1997), and Leites and Weidmann (1998). These studies focus on corruption as the main indicator of institutional quality. The rationale is that corruption is perceived as the product of institutional weaknesses, and hence it is appropriate to use it to proxy for institutional quality. This particular issue is discussed more fully in Section III below.

The studies by Mauro (1998) and Tanzi and Davoodi provide the first attempt at estimating the effects of corruption on economic growth through its effect on public expenditure. Their results are very interesting: corruption distorts both the composition and quality (productivity) of government expenditure, resulting in lower growth rates. However, these studies do not take account of the possible reversed causality effects between corruption and the measured dependent variables, or the potential measurement errors relating to the corrupting indices used in their analysis. This may render the results of these studies suspect.

Leites and Weidmann (LW), on the other hand, attempt to identify the key determinants of corruption, emphasizing the endogeneity of corruption. They show that the extent of corruption depends on natural resource abundance, government policies, and the concentration of bureaucratic powers. Leites and Weidmann are one
of the very few researchers in this area that have actually carried out their empirical analysis on the basis of a formal theoretical framework. The model they develop, which is based on an open-economy version of the infinite-horizon growth models, helps to clarify the dynamic relationships between corruption and economic performance, including the dynamic effects of anti-corruption measures and the economy's stage of development.

The work by La Porta et al (1998) and Easterly and Levine represent a major breakthrough in the analysis of the link between institutions and economic performance by addressing specifically the question of why some countries have better institutions, and hence governments, than others. Applying separate regressions to capture the effects of the history, legal origins, geographical and social characteristics, and religion of countries on government performance, La Porta et al find that countries that are poor, close to the equator, ethno-linguistically heterogeneous, use French social law, or have high proportions of Catholics or Muslims exhibit inferior government performance. (Refer to Appendix 1 for full details of these regressions). For their parts, Easterly and Levine focus on ethnic diversity as a key factor explaining cross-country differences in public policies and other economic indicators. They show that, in the case of the African countries, high ethnic diversity is closely associated with low schooling, underdeveloped financial systems, distorted foreign exchange markets, and inadequate infrastructure. This result lends support to the theories that interest group polarization leads to rent-seeking behavior and reduces the consensus for public goods, creating long-run growth tragedies.

Thus, on the basis of the empirical studies outlined above, the importance of institutions and governance for economic growth and development appears to be a well-established and empirically substantiated proposition. This is not to say,
however, that these studies are not without criticisms as there are scepticisms about the appropriateness and reliability of the institutional indices used in most of these studies. These issues are the subject of the remainder of this chapter.

III THE INSTITUTIONAL INDICES

Because of the multifaceted and abstract nature of institutions, the identification and measurement of institutional indicators pose the biggest challenge to researchers in this area. While no single index can conceptually capture all aspects of institutions or governance, a focus on key observable aspects of institutions can be helpful in providing a comparative perspective on differentials in the quality of institutions among different nations. The observable aspects of institutions that most economists focus on include: Bureaucratic quality and efficiency, Infrastructure quality, Corruption, Rule of law, Expropriation risk (Nationalization potential), Repudiation of contracts by governments, and Political stability.¹⁹ But how would one measure these variables? Fortunately, indices for these institutional variables have been developed by private risk-rating firms, and more recently, by international organizations such as the World Bank, and made available to the researching community.²⁰ To place things in proper perspective, a brief description of each of these institutional variables (indices) is necessary.

The *Bureaucratic Quality and Effectiveness* index refers to the bureaucracy’s “autonomy from political pressure” and “strength and expertise to govern without drastic changes in policy or interruptions in government services”. It also refers to the

¹⁹ Different studies may use different terms, but essentially refer to the same theme.
existence of an established mechanism for recruiting and training in the civil service, and efficiency of the civil service in executing its functions. Thus, this index is used to measure the efficiency with which government services are provided. The scoring system is categorical, involving integers between zero and ten, depending on the supplier of the index. For instance, the ICRG scoring system for this particular variable runs between zero and six, while that of BERI runs between zero and four. When countries score low on this index, it is a strong indication that a bureaucracy lacks procedural clarity or technical competence, and is likely to introduce criteria other than efficiency in the allocation of public goods. This index is analogous in many respects to the Infrastructure Quality index, which refers specifically to the quality of such public goods provision as schooling, health, and physical infrastructure.

The Corruption index seeks to capture the extent to which “high government officials are likely to demand special payments” and to which “illegal payments are generally expected throughout lower levels of government” in the form of bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans”. The index is designed to measure the extent and damage of rent-seeking behaviour in government. The scoring system is as in the Bureaucratic Quality index above. The countries scoring low on this index are less likely to provide a strong bulwark against infringements on property rights. The resulting distortions in investment and trade may reduce the quantity and efficiency of capital investment and foreign technology introduced into the country.

It is important to note, however, that acts of corruption do not necessarily always involve the payment of bribes. For instance, a public official who claims to be

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20 Refer to Kaufmann et al (1999) for a comprehensive list of private firms and organizations producing these institutional indices.
sick but goes on vacation instead is also engaging in an act of corruption. Likewise, a
government minister who authorizes the rezoning of lands in order to increase the
value of his land is also engaging in act of corruption. It is in this context that it is
more appropriate to define corruption as “the abuse of public power for private
gains”, as adopted by the World Bank.

The Rule of Law index “reflects the degree to which the citizens of a country
are willing to accept the established institutions to make and implement laws and
adjudicate disputes”. Together with the Expropriation Risk index below, this index
has been widely used as a proxy for the security of property and contractual rights.
Higher scores on this index imply sound political institutions, a strong court system,
and provisions for an orderly succession of power.

The Expropriation Risk index refers to the risk of “outright confiscation” or
“forced nationalization” of assets by government. As mentioned above, this index
serves as a proxy for the security of property and contractual rights. If countries score
low on this dimension, they are likely to suffer a reduction in the quantity and
efficiency of physical and human capital. That is, as the probability of expropriation
increases, investors reduce their investment and channel their resources to activities
that are more secure from the threat of expropriation.

The Repudiation of Contracts index indicates “the risk of a modification in a
contract taking the form of a repudiation, postponement, or scaling down due to
budget cutbacks, indigenization pressures, a change in government or a change in
government economic and social priorities”. When countries score low on this index,
it implies that their credibility to honor agreements and contracts are suspect, and
entrepreneurs are likely to be suspicious of the effectiveness of institutional barriers in
preventing government officials from pursuing confiscatory policies (through taxation
or inflation), or outright expropriation.
Finally, the *Political Stability* index refers to "the conduct of political activity, both organized and individual, and the degree to which the orderly political process tends to disintegrate or become violent". The rationale is that if a country is highly politically unstable, institutional and non-institutional mechanisms for protecting property and contractual rights are more fragile, and entrepreneurs are likely to reduce or reallocate investment to avoid risk.

To sum up, good institutions can be identified with governments whose bureaucracy is effective and uncorrupt, where the provision and allocation of public goods is efficient and effective, where the judicial system is independent and reliable, where the risk of expropriation or nationalization is very low, and where the likelihood of wrenching changes in government is minimal.

Before closing this section, two points are worth noting. First, it must be emphasized that the institutional variables discussed above do not purport to represent all aspects of governance or institutions, nor do they purport to represent the true measures of the quality of institutions or governance. One could consider a wider dimension of governance, incorporating, for example, social and cultural institutions. However, given the high correlation between the various aspects of institutions at the macro level, the effect of such omissions is minimal. Second, the indices discussed above are based on the *perceptions* of the interested parties, and thus cannot be viewed as objective measures of governance or institutional quality. They are imperfect indicators of institutional quality and must always be viewed as such.
To understand fully how the indicators for institutional quality outlined above are actually derived and measured, it is necessary to examine the methods by which the private firms producing these institutional indices collect and process data on these variables. There are two methods commonly employed by firms for the purpose of constructing the relevant indices. These are (i) expert opinion polls, and (ii) cross-country surveys of firms' managers and the general citizen.

The expert-opinion-polling approach entails the following procedure. First, country analysts/experts (agents of the firms) produce an initial assessment for each country based on publicly available information and their direct knowledge of the country. These assessments are guided by a checklist of specific issues (risk events) considered relevant for risk ratings of countries. (For instance, for the Corruption Index, there will be a checklist of risk events that identify the possibility of a corrupt bureaucracy). These initial ratings are then reviewed in the headquarters by a panel of regional and sectoral experts, who determine the final rating for each country. The scoring system is on a categorical scale, using integers between zero and ten, with higher scores (higher value of the index) indicating positive results and lower scores negative results.

The second method - cross-country surveys - involves a survey of the opinions of business-people or citizens in general on a variety of questions (risk events) relating to institutional quality or governance. Typically, survey respondents are asked to rate aspects of governance on a categorical scale. The final scores for each index are based on averages by country of the responses of a large number of respondents to those questions. Because surveys are very costly to design and implement, they typically cover a much smaller set of countries than polls of experts.
In discussing the major shortcomings of the institutional measures discussed in Section III, emphasis is on the problems associated with the reliability of the data on these institutional variables, and on the econometric-related issues arising from these data problems. Firstly, because the data collected under the two methods discussed above are based on the perceptions of the people being surveyed or consulted, the resulting rating may be susceptible to a high degree of subjectivity and bias. For instance, in the case of ratings based on expert polls, the indices are based on the opinions of only a few experts per country, and thus the quality of the country ratings depends to a great extent on the judgement of those experts. Moreover, there is the danger that those ratings may be influenced by economic outcomes or the particular political or ideological agenda of the agency doing the rating. In the case of ratings based on surveys, survey questions can be interpreted in context- or culture-specific ways. For instance, a response regarding the prevalence of “improper practices” may be colored by country-specific perceptions of what “improper practices” are perceived to be. This increases the chances of bias, hindering cross-country comparability of responses to otherwise identical questions.

Secondly, the variables chosen as indicators of institutional quality are only proxy variables, the measures of which are imperfect. From an econometric viewpoint, the use of such proxy variables increases the risk of measurement errors in the variables, resulting in the estimated parameters being biased and inconsistent, and hence negating the validity of the regression results. Most empirical work discussed in Section II (e.g. Knack and Keefer 1995, and Tanzi and Davoodi 1997) assumes away these potential measurement error problems, hoping that they are sufficiently small not to destroy the validity of the estimation procedure. Some researchers, such as Hall and Jones (1999) and Kaufmann et al (1999), explicitly recognize this potential measurement problem and use the instrument-variable estimation procedure to
mitigate it. However, the instrument-variable approach is only half-effective: while it guarantees consistent estimation, it does not guarantee unbiased estimation (Pindyck and Rubinfeld, 1991).

Finally, the institutional variables above are highly correlated to each other, as noted by various researchers, and thus it is difficult to tell which of the several institutional variables is crucial for economic performance. This does not lend itself well for policy analysis and advice. The inability to isolate the marginal effect of each institutional indicator renders the institution-economic performance relationship largely a "black-box", at least beyond the obvious statement that effective institutions lead to economic growth and development. Identifying dimensions of public institutions most pertinent for good economic performance is not easy, and constitutes a major challenge to future research in this area.

In light of the limitations of the institutional indices discussed above, one must guard against blind use of these indices in the analysis of institution-economic performance relationships. This is not to say that these indices are of no value. The empirical studies referred to in the previous sections have provided overwhelming evidence on the explanatory powers of these indices, and their consistency with empirical data. This should shake off scepticisms about the usefulness of these measures. Moreover, the fact that the market for these "institutional products" is growing is testimony to the reliability, and hence usefulness to the research world, of these indices. Unless more objective and directly measurable indicators of the effectiveness of institutions are available, empirical research in this field of study will continue to rely on the institutional indices discussed in this chapter. The present study complements the ongoing effort to develop alternative measures of the indicators of institutional effectiveness that are more objective and directly measurable.
V SUMMARY AND CONCLUDING REMARKS

The crucial role that institutions play in the economic growth processes is a well-established proposition. The empirical work on this relationship has provided overwhelming evidence on the importance of the institutional roots of economic growth, and the extent to which they help explain the different economic behaviors of different countries. However, as highlighted in the foregoing discussions, the results of these studies must always be viewed with caution given the inherent and econometric shortcomings of the various institutional measures used.

The daunting task still facing researchers in this field, however, is the ability to pin down aspects of institutions that are most crucial, as opposed to those that are less crucial, for economic performance. As underlined in the preceding section, this is a formidable challenge to economists since the institutional variables are highly correlated with each other and, therefore, it would be very difficult, if not impossible, to isolate the marginal effects of one variable or a group of variables from the others. This puts economists in a dilemma who have to make a choice between either continuing to treat the linkages between institutions and economic performance as nothing more than a mere "black-box", or simply focus on specific indicators of institutions, such as the level of corruption or property rights security. The latter approach is what the present study adopts.
CHAPTER 5

INSTITUTIONS AND GROWTH IN THE PICs

Introduction

As discussed in Chapter 2, the performance of the Pacific Island economies (PICs) over the past two decades has been characterized by economic growth rates that are low on average yet extremely volatile. This has been so despite favorable levels of natural and human resources, high levels of public investment and aid, and reasonably prudent economic management. Questions may be posed therefore as to what accounts for this poor performance of the PICs, especially when countries elsewhere of the same size and characteristics have registered impressive growth performance during the same period? Although the inherent structural constraints characterizing the PIC economies have a direct impact on the performance of these economies, one cannot dismiss the more fundamental constraints imposed by the policy and institutional environment in which these countries operate.

The purpose of this chapter is to examine the role that institutions play in the growth performance of the PICs, drawing on the experiences of the selected Pacific islands. This is not an easy task for two reasons. Firstly, it requires proper understanding of the determinants of, and their relative contributions to, economic growth, and how institutions fit into the whole process. Secondly, it presupposes a generally accepted definition of the term ‘institutions’ and the ability to identify components of it that are crucial to economic growth and development. Both these issues are still unresolved in the literature and the subject of on-going empirical research.
To place in perspective the role of institutions in the growth process of the PICs, it is necessary to examine critically the relative contributions of the traditional determinants of economic success, namely, factor accumulation and policy, and analyze why the contributions of these variables tend to be less than optimal in the case of the PIC economies. Is it because of the level and quality of the institutions operating in island economies? It would be logical, therefore, for the purposes of this chapter to compare the relative contributions of the neoclassical production function approach, the policy approach, and the institutional approach, as explained in Section II below.

The structure of the chapter is as follows. The next section, Section II, provides a framework for analyzing the growth performance of the PICs in general based on the three approaches referred to above. Section III evaluates these three approaches in terms of their explanatory powers in unraveling the irony of the PICs’ continued poor growth performance despite favorable levels of natural and human resources, high levels of aid flows and public investment, and sound economic management (the so-called “Pacific Paradox”). Finally, Section IV summarizes the discussions.

II EXPLAINING THE GROWTH PERFORMANCE OF THE PICS

The question posed about the dismal economic performance of the PICs relative to other small countries of comparative standing calls for answers that would necessarily involve value judgements on the part of an analyst. Indeed, the question as to why some countries are so “rich” and others so “poor” is often a difficult one to
answer, given its multi-dimensional nature and, by implication, the multiplicity of the answers that could be generated.

For expository purposes, the answer to the question may fall into one of two lines of explanation. On the one hand, one could say that those other countries are so rich and we so poor because they are so good and we so bad. That is, they are hardworking, knowledgeable, educated, well-governed, efficacious, and productive, and we are the reverse. On the other hand, one could say that those countries are so rich and we so poor because they are so bad and we so good: they are greedy, ruthless, exploitative, and aggressive, while we are weak, innocent, virtuous, abused, and vulnerable. It is not clear, however, that one line of argument necessarily precludes the other. What is clear is that insofar as one may want to do something about the gap between rich and poor, these explanations imply different strategies. This in turn presupposes a clear knowledge of the complex forces at play behind the growth process.

The task of explaining differences in growth rates across countries remains a formidable challenge to economists. There are three approaches that could possibly be adopted to assist in this task: (1) the neoclassical approach; (2) the policy approach; and (3) the institutional approach. One other approach that is not included here, for the reason to be explained, is the fatalism approach. The essence of this argument is that the PICs are doomed to perform poorly because of the unfortunate reality of their being small and the severe physical and resource constraints they face. This argument lacks substance as testified by the empirical research of Easterly et al (1999) and others that has found no significant relationships at all between a country’s size and its growth potential. In fact, as Duncan et al (1999) argue, whatever the role of physical wealth and whatever the wealth of the PICs, such things as size, location, and climate are facts of life — they are the “pot” in which alterable ingredients of growth
(i.e., physical capital, good policy, human capital, and institutions) are mixed. The PICs must make the absolute best of these facts of life and not resign to poor economic performance because of them. Indeed, this is the stand that the present study adopts.

The Neoclassical Approach

The neoclassical production function approach ascribes differences in growth rates across countries to differences in the level of factor accumulation and productivity. According to this approach, therefore, the PIC economies perform poorly because they lack the necessary physical and human capital, and have limited access to technology. But how realistic is this neoclassical explanation in light of the actual experiences of these island economies?

Consider capital first. While it may be true that most of the PICs, in particular the smaller island states such as Kiribati and Tuvalu, lack sufficient domestic savings, and hence capital, required for vigorous growth, the availability of other funding resources, with which most of these countries are blessed, would make this proposition untenable. As indicated in Table 5.1 below, most of these economies have been enjoying levels of aid flows, which, in per capita terms, are the highest in the world. These aid moneys have substantially supplemented the otherwise insufficient domestic savings in these economies. Despite these generous aid moneys, however, most of these economies still perform poorly, with no signs of converging to the growth paths of the developed economies, or the more successful developing island nations in other parts of the world.
Table 5.1: GDP Growth, and External Grants, 1985-97

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Fiji</td>
<td>2.4</td>
<td>2.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Federated States of Micronesia</td>
<td>4.4</td>
<td>1.2</td>
<td>59.7</td>
</tr>
<tr>
<td>Kiribati</td>
<td>2.9</td>
<td>1.6</td>
<td>39.3</td>
</tr>
<tr>
<td>Marshall Islands</td>
<td>4.4</td>
<td>-0.3</td>
<td>55.2</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>3.2</td>
<td>4.4</td>
<td>14.6</td>
</tr>
<tr>
<td>Samoa</td>
<td>-1.8</td>
<td>1.7</td>
<td>13.4</td>
</tr>
<tr>
<td>Tonga</td>
<td>1.2</td>
<td>2.6</td>
<td>14.6</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>2.8</td>
<td>2.6</td>
<td>14.6</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>2.4</strong></td>
<td><strong>2.4</strong></td>
<td><strong>26.5</strong></td>
</tr>
</tbody>
</table>


On the other hand, if it is true that the PICs really lack capital, then in line with the law of diminishing returns, the return on capital in these economies should be many times higher than in the capital-intensive (developed) economies. In consequence, we should expect a massive flow of capital from the developed countries to the PICs to take advantage of these higher rates of return. However, this has never been the case: the return on capital is far from its scarcity value, and the flow of foreign direct investment into the PIC economies represents nothing more than a trickle. Ironically, there is strong evidence that the flow of capital tends to be more from the PICs to the richer countries, such as Australia, New Zealand, and the United States.

Thus, the argument that the PICs perform so poorly because they lack capital may not necessarily be true. There appears, therefore, to be more than just the shortage of capital that accounts for the poor growth performances of these economies.

Turning to the second factor of production – labor – again, this can be analyzed on two fronts. In the first instance, if it is true that the PICs are poor because they lack human capital, then this would imply that the returns from possessing skills in these countries would be very high, compared with those countries where the
supply of skilled manpower is excessive. But shouldn’t this precipitate a massive
migration of foreigners with skills into these economies to take advantage of the
higher rewards on skills that these countries should have offered? Also, shouldn’t this
discourage those few highly skilled and educated citizens of the PICs from migrating
to the high-income countries? Evidence shows just the opposite: the inflow of skilled
expatriates into the labor markets of these economies is minimal, while there is an
increasing trend for skilled labor in the PICs to migrate to the developed countries.

On the other hand, if we were to argue that the low ratio of resources to
population (due to over-population) is the main constraining factor, the evidence
available does not square well with this line of analysis. Some of the most highly
populated countries (i.e., in terms of population density), such as Singapore and
Japan, are among the wealthiest countries in the world. Another counter-example that
is more relevant to the PICs is the Norfolk Island success story. 21

Thus, as with physical capital, the lack of human capital is hard to justify as a
-crucial factor responsible for the poor growth performance of the PICs.

On the question of technological progress as a key factor explaining
differences in growth rates across countries, this also is not a convincing explanation.
The increasing globalization of the world economies makes the world’s stock of
knowledge and ideas available at little or no cost to all countries. Governments and
investors in poor countries can acquire these technologies, either freely or on
commercial terms. Given the unrestricted transfer of technology across countries,
there is no real ground to ascribe the poor economic performance of the PICs to
limited access to superior technologies. But if, indeed, these technologies are not
made available to the PICs, one may wonder whether the lack of incentives to

21 Refer to Duncan et al (1999, p.192) for full details of this success story.
facilitate the transfer of such technologies to the PICs is the key factor? Thus, the technology-based argument is hard to justify also.

All in all, the neoclassical explanation based on factor accumulation and productivity cannot resolve the puzzle surrounding the question of why the PICs in general and the smaller island nations in particular tend to under-perform. As discussed above, there is nothing about being poor or small that denies the PICs access to resources essential for their growth and development. It is necessary, therefore, to extend the inquiry beyond this factor accumulation and productivity story and consider more fundamental determinants of economic growth. A first logical step in this direction is to ascertain whether the policy environment in which the PICs operate has a part to play in this whole state of affairs.

The Policy Approach

Certainly, appropriate economic policies would make a difference to the growth performance of the PICs. A number of studies (e.g., ADB 1998a, World Bank 1991) have attributed the disappointing performance of the PICs largely to the ineffective macroeconomic policies that these countries have been following. This has compelled the PICs to give considerable attention to policy areas, such as reducing the size and role of government in business activity, lowering barriers to trade, and liberalizing investment regulations and markets.

The World Bank undertook in 1991 a landmark study that critically examined the role of policies in the growth performance of the PICs. In this study, the World Bank attributed the poor performance of the PICs in the 1980s to an “inability to adapt to needed structural reforms”. That is, growth during this period has been
inhibited by inappropriate policies, and if these policies can be reformed growth will accelerate. But what exactly are these inappropriate policies?

The report argues that “the dominant role of the public sector, a general lack of competitiveness, an inward orientation, a regulatory rather than a promotional approach to private investment, and weak financial sectors all combined to stifle private sector development.” There is then a “need to reduce the public sector’s relative command over the economy’s resources.” This entails the need to restructure the system of public enterprises with a view to liquidating and privatizing those government-run corporations and companies that are more appropriately within the province of the private sector.

Moreover, the report recommends that a relatively undistorted incentive regime should be put in place that moves the islands away from their inward-oriented development and protection from foreign competition. This involves the dismantling of the remaining restrictions on external trade and the excessively regulatory environment that impedes foreign direct investment. Controls on the cost and allocation of capital need to be phased out and capital market development should be encouraged.

With respect to labor markets, there is heavy criticism of centralized wage-setting systems, which resulted in considerable downward rigidity in real wages - effectively severing the link between wages and productivity. Hence, there is a need to allow greater flexibility in the setting of private and public sector wages, and to place controls on wage and salary increases or the number of government employees in the public sector.

The implication of the World Bank prescriptions outlined above is that once all those restrictions that hinder private investment are removed, and the private sector is no longer stifled by over-regulation, the dynamic forces of the private sector will be
unleashed and, combined with a surge of foreign investments, the rate of economic growth will dramatically rise. In other words, the cornerstone for the restoration of sustained growth, according to the World Bank, is greater participation of the private sector in investment and economic activity. The Bank even goes as far as providing the projected growth rates if these reforms are undertaken: they projected a doubling (Solomon Islands, Samoa), tripling (Kiribati, Vanuatu), and even fivefold (Fiji) increases in annual growth rates of real GDP over the decade of the 1990s.

But are poor policies really the most limiting constraint in the case of the PICs? How important have inferior policy outcomes been in the PIC’s context? Take the example of Kiribati. The level of per capita income for Kiribati is well below that of most island countries in the Pacific region, and the country faces enormous constraints: 33 atolls spread over a vast area of ocean; no exploitable mineral resources; small land area, and poor soil quality and a scarcity of fresh water; little manufacturing; and limited tourism potential.

In searching for ways to raise income levels, the orthodox solution focuses on getting rid of government-created distortions in the economy. But in Kiribati this search appears fruitless. It is a model in terms of the following orthodox economic policies:

- There has been a significant fall in government expenditure as a proportion of GDP.
- There are regular budget surpluses. The government has exercised fiscal restraint and made substantial cuts in public sector real wages.
- More flexible pricing policies, strengthened cost control and managerial capacity have considerably strengthened the finances and performance of the public enterprise sector.
• The tax/GDP ratio compares favorably with other countries in the region.
• Inflation is stable and moderate.
• Wage rates are among the lowest in the Pacific.
• There are no current account problems – indeed, surpluses exist.
• There are also no external debt problems: most of the aid is in the form of grants.
• An extremely open exchange and trade system exists, with a liberal policy towards foreign investment.

The Kiribati government has performed impeccably in all these standard policies. In addition, the country enjoys one of the highest level of aid in the region, as well as a high level of investment averaging 24.1 percent of GDP. Yet, despite all of these good things, economic growth in Kiribati has been dismal. For the period 1989-93, the average real GDP growth rate was highly negative at -2.4 percent. It appears, therefore, that the benefits of good policies in the context of Kiribati are marginal, if not negligible, given the conditions under which the economy operates. It is far from clear, therefore, what specific policies governments should pursue beyond the standard set of policies aimed at getting the basics right in order to induce growth in the economy.

Let’s take another example, Samoa. In this case, the paradox is why Samoa has grown so slowly over the past decades, given the fortunate position, in many respects, that it finds itself in? There do not appear to be any significant handicaps imposed by factor endowments or the environment. There is an ample natural resource base complemented by a modest growth in population. Improvements in human capital have been considerable in the education and health sectors. There has
been an abundant availability of capital. Infrastructure has not been a significant bottleneck. It is true that traditional exports have done poorly over recent years, but why has development in Samoa fallen so far below expectations? What has prevented the country from utilizing its resource base to achieve a higher growth path?

Both the Kiribati and Samoa ‘paradox’ stories underscore the crucial point that it is not enough to get the basic economic policies on paper or the ground per se – other forces at play must also be recognized. This raises the need to consider the final and most fundamental approach – the institutional approach, which may provide a solution to this puzzling question.

The Institutional Approach

If both the neoclassical and policy-constraint arguments lack credibility and robustness in explaining the growth performance of the PIC economies, what could account for the dismal performance of these economies? It is the fundamental proposition of this study that it is not the lack of natural or other resources and good policies that constrain the growth and development of the PICs, but rather the lack of incentives to accumulate and acquire those resources or formulate good policies. This brings to bear the important role that institutions play in the provision of such incentives. This is not to say that resources and policies are not significant factors in the growth process. The point is that in the absence of workable and effective institutions, the potential contribution of these resources and policy reforms to growth may be severely hampered. More specifically, in the absence of secure property rights, enforceable contracts, and a relatively honest and competent bureaucracy, the full benefits and potential of these resources and policies may not be realized.
There are two main types of "consumers" of incentives: private investors and bureaucrats, or more simply, public officials – i.e., those with power to manage the nation's social and economic resources. Private investors, in particular foreign investors, require an environment that would give them the confidence to invest and apply their skills and technology. The most important of these incentives are secure property and contractual rights and an effective judiciary system. On the other hand, bureaucrats also require appropriate incentives in order for them to be able to carry out their functions effectively – formulating and implementing effective rules and policies pertaining to the management of the nation's resources. Failure to have in place the right incentives is likely to lead to a public service that is corrupt, dishonest and incompetent.

The structure of incentives depends, therefore, not only on what economic policies are chosen in each period, but also on the institutional arrangements: on the legal systems that enforce contracts and protect property rights, on an uncorrupt bureaucracy implementing these policies, and on political structures and constitutional provisions. Ultimately, improvements in the economic environment through policy and institutional reforms are necessary for creating maximum incentives to invest in physical and human capital, and to maximize returns to a nation's capital and natural resources.

Various researchers have put forward theories coupled with statistical evidence pointing to a crucial role in development for one variable or another. Such keys to economic development include investment in human capital, financial sector development, capital investment, trade openness, fiscal policy, and macroeconomic stability. Without denying the importance of any of these factors, there are important interactions between policy reforms in these areas and the quality of institutions: in the absence of secure property rights, enforceable contracts, and a relatively honest
and competent bureaucracy, the full benefits of such policy reforms cannot be achieved.

While considerable attention has been given to policy reform in the Pacific, less attention has been given to the basic institutions that support the operation of markets and private sector development. As reported by the ADB (1998a), the dismal economic performance of the PICs reflects the institutional environment, in particular the absence of appropriate property rights – or the absence of state protection of property rights – and of impartial third party enforcement of contracts by the state. The central theme of the ADB report is that per capita income in the PICs could move to levels several times higher than at present, if only they could put in place the institutions and policies that are fundamental to the effective operation of free enterprise economies.

If institutions are the key to development, what constitutes effective institutions? As briefly outlined above, the most commonly used examples of institutions essential to economic growth are secure and transferable property rights, enforceable and impartially enforced contracts, a relatively competent and honest bureaucracy, and internationally acceptable accounting standards. Note, however, that institutions extend to an almost endless number of rules, sanctions, understandings, and customs which, in the context of the PICs, could be very complicated.

A brief survey of the institutional environment operating in the PICs, focusing on the key institutional components most relevant to these economies, is in order at this point. These key components include property and contractual rights security, a
competent and honest bureaucracy, and an effective judiciary - including law and order, respect for the rule of law and political/civil liberty.22

(a) Property and Contractual Rights

Effective property and contractual rights have three basic characteristics: public security and protection from theft; protection from arbitrary government actions, ranging from unexpected and ad hoc changes in regulations and taxes to outright corruption; and a fair, independent and predictable judiciary. A fully efficient property rights regime requires additional demanding conditions that involve complete and exclusive specification and effective enforcement of all entitlements and no restriction on transferability of property rights to others. Unless an effective property rights regime is in place, the evolution of market institutions will be impeded - making difficult voluntary exchange and specialization. There is evidence that countries in which property rights are insecure have experienced difficulty in attracting investment and have thus constrained their growth prospects.

In the Pacific, nothing is more concerning than the development of an effective property rights regime over land rights. This is not only because of the scarcity and hence the greater developmental value of land throughout the PICs, but also more importantly because of the unique system of common ownership of land that prevails in these largely traditional societies. Given their cultural predisposition toward common rather than private property and limited government commitment to security of land tenure for private agents, the PICs face particularly difficult problems in developing more secure individual property rights and title over land. This means that opportunities for individual initiative and entrepreneurship are stifled,

22 It is difficult to prescribe the “right” institutions. Indeed, one of the features of institutions in development is that there is no single driving force to determine either behavior or structure so that
discouraging new capital formation. Access to credit is also affected by this communal ownership system because of the connection between the lack of individual security of title to land and the poor development of a credit market.

The two crucial factors contributing to concerns regarding the insecurity of exclusive tenure and title over land in the PICs, whether in the form of freehold or leasehold, are the lack of reliable records relating to land rights and the lack of explicit government commitment to the enforcement of those rights. As reported by ADB (1998a), only a small proportion of the lands in the PICs has been registered. While most lands in the Cook Islands, Fiji, Kiribati, Nauru, Tonga, and Tuvalu have been registered, in the larger countries (Papua New Guinea, Solomon Islands, and Vanuatu) very little has. The registration of lands helps identification and proper definition of legal ownership of lands and hence enhances security of tenure for private agents. However, the fact of having been registered does not mean that registration is necessarily up to date. In Kiribati and Tuvalu, for example, registrations are out of date, with many lost, inaccurate, or even forged or otherwise illegally amended. For example, in 1997 the Department of Lands in PNG sacked 30 senior staff for bribery, corruption, and misappropriation on a very large scale in connection with land registration matters. Thus, registration of land would be of no use unless the records are up to date, accurate, and reliable.

Apart from the problem associated with the system of land ownership prevailing in the PICs, there are two additional constraints on the development of an effective property rights regime: the government's commitment to ensuring security of such rights, and the effectiveness of the judiciary in protecting and enforcing those rights. That is, the assumption that legal title is secure title is too simplistic in practice. Also essential is security of tenure, not only in the sense of knowing that the register

there are no easy generalizations or operational rules.

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is accurate but also that the rights will be protected and that laws will not be arbitrarily changed to disadvantage investors. In most of the PICs, the government's commitment to protecting property rights is often not explicitly codified either in law or decrees or in any other government policy documents. One classic example is that of the Nikko and other hotels on Saipan in the Northern Mariana Islands, where their basic land right title was being contested in court. Some of the largest investors were threatening to pull out and others were reluctant to come in until the tenure of the land was confirmed with clarity that would give them confidence to invest there.

Saipan is not an isolated case. The burning down by landowners of the Anuha Resort in Solomon Islands, the attacks on resorts off Lautoka by landowners in Fiji, and the threats and actions by Samoans on the Mulifenua Resort causing it to be postponed, are some of many indications that having legal freehold, leasehold or other title is not necessarily enough to guarantee effective security.

On the issue of arbitrary changes of law by government that could impinge upon the security of exclusive land rights and tenure, the most marked case was Vanuatu, where the most extensive alienation has taken place. Before independence, most of the high quality land in Vanuatu was held in marketable freehold by non-indigenous people. However, at independence, all freehold was cancelled and all land was made the property of the descendants of the indigenous owners. Likewise, in Papua New Guinea, from the time of self-government in 1965, the extent of freehold was reduced and the transferability of remaining freehold increasingly constrained. The same has been true of Solomon Islands, Samoa, and Kiribati.

Thus, the strong attachment to ownership of land by kin groups and the apparent lack of state commitment to protecting rights appear to be the major constraints on growth in the PICs because the insecurity of exclusive tenure retards investment and inhibits the development of a capital market. It is important, therefore,
to consider what role the state can play in promoting and enforcing institutional change in this direction? What allowance should be made for the cultural preference of communal ownership in the PICs?

(b) Effectiveness of the Bureaucracy

An effective bureaucracy constitutes a key component of the incentive regime to the extent that it plays a central role in the effective development of the overall incentive regime in the country. This is true especially for the PICs where the public sector is a key player in the economy, controlling not only the management of the bulk of the nation's social and economic resources but also the rules and ways in which those resources are managed.

The essential elements of an effective bureaucracy include rule credibility, policy credibility, and resource adequacy and predictability. Combined, these elements constitute the institutional environment in which bureaucrats operate. It is this institutional environment that drives the performance of the public officials insofar as it shapes their expectations of future constraints and incentives. For instance, an official who has come to expect that rules will not be enforced works in an environment of low rule credibility, and this will shape his behavior. Similarly, willingness to gear actions to support ministerial policies is somewhat greater if officials believe that policies will remain in force for a period of time, and will not be undermined by other policies of equal force. Finally, if public officials believe that government projects do not have adequate and secure resources in terms of finance, human resources, and institutional capacity, they expect that such projects will not last and this will determine their future behavior and conduct in relation to that project.
All in all, the institutional environment - comprising rule credibility, policy credibility, and resource adequacy and predictability – defines the incentive structure of public officials within the public service and drives their performance. Thus, if the institutional environment is strong and effective, then public officials are likely to be strong and effective as well, and, by implication, the policies and decisions they will make will also be effective. On the other hand, if the institution is weak, the opposite will hold. Corrupt behavior may develop, leading to a bureaucracy that is dishonest and incompetent. This in turn could undermine the integrity and effectiveness of the entire incentive regime. For instance, with a corrupt bureaucracy the policies and commitments towards the protection of property rights will be severely undermined. Likewise, with an incompetent and dishonest bureaucracy, the independence and effectiveness of the judiciary will be hampered, possibly because of improper recruitment procedures or due to the inadequacy and unpredictability of resources to support its effective functioning.

With the exception of Fiji and possibly Vanuatu, the government sector in the PIC economies plays a dominant role, both in terms of its contribution to GDP and the share of formal sector employment. In Kiribati, for example, the government sector accounted for about 85 percent of GDP for the period 1985-89. Apart from the effects of aid funds, the bloated size of the government sector in these economies is due to the tendency of the PIC governments to become involved in business activity either by means of government business enterprises, through joint ventures with domestic or overseas investors, or indirectly through the provision of tariffs and subsidies. Generally, government intervention of this kind is a matter of doing too much of the wrong things and not enough of the right things. As noted by ADB (1999), in an

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23 Some may argue that effectiveness of the bureaucracy should be identified with the four “pillars” of governance, namely, accountability, transparency, predictability, and participation. All these are
economy where the public sector plays a large economic role, there is the risk that the evolution of market institutions will be impeded. In this case, the government is likely to neglect its core functions, in particular the development of its regulatory function that must support the evolution of market institutions.

The fact that the public sector is relatively large in these economies is not an issue. The issue is whether the public sector operates within the appropriate incentive structure – meaning a structure with credible rules, credible policies, and resource adequacy and predictability – that will ensure its efficient and effective functioning. Evidence has shown that such an ideal incentive structure rarely exists within the public service of these economies. The failures of the National Bank of Fiji and the Polynesian Airline in Samoa in the mid 1990s are good examples of the point at issue. It is fair to say that the arbitrary behavior of officials that led to the downfall of both government-owned companies was influenced by their expectations of the credibility of the rules that constrain their behavior, the credibility of the policies they were asked to implement, and the manner in which they were provided with resources.

One very important symptom of an ineffective institutional environment characterizing most of the public services of the PICs is the prevalence of corruption. While corruption is not an endemic phenomenon in most of the PICs, especially for the smaller island states, it is a particularly serious problem for the bigger island nations such as Papua New Guinea (PNG) and Fiji. The downfall of the National Bank of Fiji in the early 1990s which cost the Fiji taxpayers over F$200 million, or the corrupt tender deal involving the redevelopment of the Jackson International Airport in PNG in 1994 (see Box 5.1), are some of the very serious instances of corruption in the region. The abuse of slush funds by politicians in the form of funding bogus community organizations or non-existent (ghost) infrastructure is encapsulated by the three elements of effective bureaucracy outlined in this paper.
another example of systemic corruption in PNG. Another notorious breeding ground for corruption is in the system of recruiting and promoting within the public service which, in most cases, is based more on political patronage and ideological affiliation rather than on merit – creating a non-meritocratic public service. The latter leads to a bureaucracy that is incompetent, dishonest, and ineffective.

**Box 5.1: Corruption in PNG – The Jacksons International Airport Saga**

The Port Moresby (Jacksons) International Airport Redevelopment Project corruption saga is a classic example of a case where entrepreneurs and bureaucrats tend to collaborate when it comes to contract awards.

The construction phase of the Jacksons Airport was recently completed by a large construction firm (Fletcher Morobe Construction (FMC)) at the cost of a US$57 million. This was funded on concessional terms by the Overseas Economic Cooperation Fund of Japan (OECF). Controversy with allegations of corruption surrounded the award of the contract to FMC. The main complainants were representatives of the construction fraternity in Port Moresby and sections of the implementing agency, the Office of Civil Aviation (OCA). They alleged foul play in the application of the funder’s (OECF) tender procedure by the OCA. The main players in this project were the OECF, OCA, and an independent joint venture consortium (JVC) comprising Pacific Consultants International and Kinhill Kramer. They had the task of evaluating proposals from the tenderers. The contract was awarded to FMC on 6 January 1995 after two years of highly suspicious dealings by key players and numerous false starts.

The tender had originally closed on 8 October 1993, but it was further extended to 1 November 1993 although the majority of the tenderers did not require the extension (National Executive Council 1995). In April 1994, evaluation of tenders was finally undertaken by the independent joint venture consortium. The result based on technical conformance ranked Kumagai Gumi as first, followed by Hyundai and Fletcher Morobe (*ibid.*). The result, however, was not what certain sections within the OCA had expected. Thus against the advice of the JVC, the OCA attempted to commence negotiations with Fletcher Morobe, who had the lowest technical score. After much open objections from the JVC, the OCA called on the tenderers to extend the validity period of their tenders beyond 14 July 1994 to 1 October 1994. Only Fletcher Morobe and Kumagai Gumi extended the validity of their tenders to 1 October 1994 as Hyundai was not approached to extend (National Executive Council 1995). However, in a move to eliminate Kumagai Gumi, only Fletcher Morobe was approached, secretly, by the OCA to extend the validity of its tender past 1 October 1994 to 29 October 1994. OCA appeared to be waiting for Kumagai Gumi’s tender validity period to expire to enable unhindered negotiations with Fletcher Morobe. Nevertheless, after objections by the JVC both contenders were again requested to extend the validity of their tenders to the end of December. Whilst Kumagai Gumi met this requirement on time, its rival was late by some three days and
yet OCA accepted its tender as valid. By this time OECF was becoming worried about OCA’s continuing attempts to negotiate with Fletcher Morobe when its tender was clearly technically inferior. In fact, the qualifying technical score level had to be lowered to let Fletcher Morobe into contention. Upon a directive from the Deputy Prime Minister on the 8 December 1994, that contract negotiations with the two tenderers be conducted simultaneously, a Contract Negotiation Report, compiled after purported negotiations with both tenderers, was submitted to the NEC. However, it became apparent after the NEC had approved the awarding of the contract to Fletcher Morobe that no negotiations with the second tenderer took place. Certain pages of the final Contract Negotiation Report appeared to have been tampered with by unknown persons as was confirmed by Kramer (1995).

It appears that some persons within the OCA received commissions from the winner. The same practices marred efforts to negotiate funding with OECF for the installation of a radar system and aviation instruments at the Jacksons Airport (Tanaka 1997). This delayed the commissioning of the international airport until March 1998 (Post Courier 17 September 1997:4). The project manager with the OCA responsible for the Jacksons Airport was thought to be at the centre of corruption allegations (Post Courier 11 December 1997). Such allegations were made earlier by the Ambassador of Japan in a letter to the PNG Minister for Civil Aviation (Hayashi 1997) but were vehemently denied by the latter (Nali 1997).

Source: David Kanavamur (2000)

(c) A Reliable and Independent Judiciary

The reliability and consistency of the application of law are as important as law itself. This condition is only possible if and only if the judiciary is reliable and independent, which can only come about if the rules and policies governing its set up and functions are credible and if the resources required to facilitate the effective execution of its functions are adequate and predictable. As highlighted above, the effectiveness of the bureaucracy has a lot to contribute towards this end, providing an incentive structure compatible with the effective functioning of the judiciary. Unless the judiciary secures these essential attributes, the whole system of law collapses which, from an economic perspective, is detrimental to investment and economic growth in terms of its adverse effects on the security of property rights and contracts.
While in most of the PICs the judiciary enjoys a fair degree of respect for its independence and integrity, for some countries the effectiveness and independence of the court systems are far from being unquestioned. This is particularly so when the legislature can overturn the court’s decisions and rulings, or when the government has the exclusive rights to appoint judges and court officials. Instances like this have occurred in Fiji, Papua New Guinea, Solomon Islands and Vanuatu in the 1990s with respect to the court decisions on land rights as already discussed above. In Kiribati, because of inadequate resources to support the work of the judiciary, some 700 cases were pending from 1990-94. It was also alleged that the Chief Justice was interfering in the results of the political election of 1994 (Macdonald, 1996).

In the Marshall Islands and the Federated States of Micronesia (FSM), poor judicial enforcement of contracts appears to be a major problem. In both countries the mechanism for dispute settlement does not appear to be working effectively. In the court systems, where most disputes should be resolved, the judiciaries are reluctant to hear disputes, and if they do hear disputes, they are reluctant to make findings; and if a finding is made, they are reluctant to enforce it.

Instances such as outlined above could do a lot of damage to the effectiveness and integrity of the court system with consequent negative effects on investors’ perceptions about the security and enforceability of property and contractual rights. This could discourage foreign investors from investing and applying their skills and technology in these economies, leading to lower rates of capital accumulation and economic growth.
Comparing the relative strengths and merits of the three approaches outlined above in explaining the economic performance of the PICs in the 1990s, it is obvious that the institutional approach stands out as providing the most credible and robust framework of analysis. The approach recognizes explicitly the important distinction between the proximate causes of economic success – capital accumulation and productivity (including good policies) – and the more fundamental determinant, namely, the institutional environment.

As already argued, preference for the institutional approach does not imply that capital accumulation, productivity, and good policies are not significant factors in the growth process. The point is that unless these resources are deployed within an effective institutional environment, maximum returns from them may not be realized. For instance, what is the point of adopting policies that will promote private sector development, and hence capital accumulation, when the property rights regime is in shambles? What is the point of investing in human capital when job opportunities in the public sector are limited, and the development of the private sector, the only other source of employment, is constrained by weak institutional infrastructures? What is the point of having good laws and legal systems when they cannot be applied consistently and independently due to corruption and the lack of an appropriate incentive structure within the legal system?

It is crucially important, therefore, that the PICs take measures to put in place an appropriate institutional framework that would provide the right incentives for the maximum deployment of its social and economic resources. The verdict is then obvious: the notion of a “Pacific Paradox” – that is, a record of slow economic growth despite relatively high levels of aid and investment, abundant natural resources for
some countries, and reasonably prudent macroeconomic management – can only be explained in terms of the institutional approach discussed above. That is, the PICs do not lack the resources and good policies necessary for economic success – the fact that they still perform poorly is because of the lack of incentives appropriate for the maximum utilization and employment of those resources.

IV CONCLUDING REMARKS

The foregoing analysis has highlighted the important point that development should not be thought of as just the accumulation of physical and human capital, and the adoption of superior technologies and policies, important as these factors are. These accumulations and adoptions depend crucially on the institutional environment of the country and the incentives that it provides. In other words, the crucial problem lies not in the scarcity of productive assets but in residents’ lack of incentives to invest in socially productive assets, and in the lack of incentives for foreign investors to transfer capital, technology and managerial skills.

As argued in this chapter, the poor performance of the Pacific Island economies during the past two decades had little to do with the lack of capital or good policies but had more to do with the lack of incentives to be able to exploit those resources to the maximum. Neither is there any justification in attributing this poor performance to the unfortunate circumstances that most of the PICs find themselves in. In this scheme of things, unless the PICs undertake appropriate institutional reform measures with a view to putting in place the conditions necessary for a broad-based,
sustained economic growth, the “Pacific Paradox” characterization of their economic performance will continue to be a matter to be reckoned with in times to come.
CHAPTER 6

CORRUPTION, PUBLIC INVESTMENT AND ECONOMIC GROWTH

Introduction

In most of the developing countries (the PICs included) there has existed a widespread presumption of the need to expand public spending and accommodate increases in the relative size of the government sector. The underlying philosophy contends that the task of re-organizing the economic structure and promoting faster growth as an explicit goal of economic policy is too important a task to be left to the private sector. The legitimacy of this philosophy has been questioned in recent years. Not only has there been increased recognition of the consequent undesirable side effects of financing these expenditures, but there has also been growing skepticism concerning the achievements of public spending and its contribution to economic growth. Underlining this skepticism is the notion that unless public resources are properly managed and deployed, an overly high level of government spending may not necessarily enhance economic growth.

Numerous studies have sought to evaluate the relationship between economic growth and government spending and/or the size of government. The results of these studies have been diverse and sometimes conflicting. While some studies have discerned a positive relationship between government expenditure and economic growth (Ram 1986), others have found that increased government spending is negatively correlated with economic growth (Landau 1983, Barro 1991, and Engen and Skinner 1992). Still, others have reported that the relationship is non-monotonic (Grossman 1988, Barro 1990, and Dowrick 1997) or that the relationship is one of
insignificance (Kormendi and Meguire 1985). All of these studies focus on government expenditure in the aggregate, using either the share of government consumption expenditure in GDP or simply using total government expenditure (i.e., current expenditure plus capital expenditure) as a proxy for government activity.

A second strand of studies (e.g., Devejaran et al 1996, Kelly 1997, Kneller et al 1999, Cashin 1995, and Diamond 1989) extend the analysis of the aggregate studies above by explicitly assessing the effects of the quality and composition of government expenditure on economic growth. This approach is based on the premise that different components of government spending have varying degrees of productivity and hence different influences on growth. However, the results of these studies do little to shed light on the proper role of government expenditure, including its composition, in the growth process. In particular, they have provided only limited support for the widely held view that public investment expenditure is crucial for economic growth. For instance, Devejaran et al (1996) find that capital investment is not a significant factor in the growth experiences of the developing countries.

The ambiguities characterizing the results of these empirical studies highlight the substantial knowledge gap that still exists in the empirical literature on the impact of government expenditures on growth, raising the specter of potential deficiencies in the whole analysis. Commander et al (1997) suggest that these ambiguities may be the result of the difficulty in determining a complete measure of government activity. All of the studies referred to above focus exclusively on the fiscal actions of governments. But governments also provide a key component of the overall institutional environment encompassing the rule of law, the security of property and contractual rights, and the effectiveness of their bureaucracy, as discussed in Chapter 4. Since the very conditions responsible for the effectiveness and efficiency of government policies operate through the level and quality of institutions operating in a country,
these institutional goods and services cannot be disassociated from the fiscal actions of governments. Thus, unless the institutional context in which government actions take place is accounted for, attempts to assess the contribution of government expenditure to economic growth may yield misleading results.

It is the objective of this chapter, therefore, to assess analytically the extent to which the quality of institutions, particularly as manifested in the prevalence of corruption, impacts on economic growth through its effect on the level and quality of public investment. A caveat is in order at this point. As noted in Chapter 4, institutional quality comprises a broad set of concerns including the rule of law, protection of property and contractual rights, risks of expropriation, political stability, and bureaucratic quality and effectiveness. The reason for focusing on corruption in the present chapter is twofold. First, and most importantly, it underscores the particularly corrosive economic effects of corruption and its pervasiveness, relative to the other indicators of institutional quality, in the developing countries, including most of the island economies of the South Pacific. Second, it allows the formulation of a tractable theoretical model that would capture the dynamic relationship between institutional effectiveness - as measured by the level of corruption – and economic growth. That is, it is much easier to capture the dynamics and trajectories of such relationship by focusing on one specific dimension of institutions.

The remaining part of this chapter proceeds as follows. The next section, Section II, attempts to put in perspective the conceptual issues pertaining to corruption in the public sector - its causes and consequences. Section III presents a simple theoretical model capturing the dynamics and interrelationships between corruption and the economic growth variables within an inter-temporal optimizing framework. Section IV considers the empirical implications of the theoretical model discussed in Section III. Finally, Section V sums up the discussions.
Corruption is a very complex phenomenon; it is like an elephant, which is difficult to describe, but is generally not difficult to recognize. There have been various attempts to provide an operational definition of corruption in the literature (e.g., Bardhan 1997, Tanzi 1994, Rose-Ackerman 1978, and Shleifer and Vishny 1993). The most widely used definition of corruption is “the abuse of entrusted power for personal gains or for the benefit of a group to which one owes allegiance”.

Because the present study focuses on corruption in the public sector, the abuse of power alluded to above relates to the behavior of public officials, in which they improperly and unlawfully enrich themselves or those close to them.24

For analytical purposes, it is useful to classify corruption in the public sector according to whether it is petty, grand or systemic. Each form has its own special attributes and entails different reform strategies and analyses of political commitment. Petty corruption involves low-level officials extracting small sums through extortions, bribery, theft or misuse of official property. Grand corruption refers to high level officials using their offices to grant contracts or extract large sums of money – perhaps from the public budget, or, using their regulatory authority, by manipulating market outcomes – for their personal or political enrichment. When both petty and grand corruption are pervasive, corruption is said to be systemic. Systemic corruption occurs when corruption has become an integral part of the system, i.e., the system cannot function without it. This type of ingrained corruption tends to flourish particularly in situations where public sector wages fall below a living wage.

One important class of corruption which is not covered explicitly in the above categorization is “state capture”. This refers to “the action of individual, groups or

24 Corruption in the private sector is beyond the purview of the present study.
firms, both in the public and private sectors to influence the formation of laws, regulations, decrees, and other government policies to their own advantage as a result of illicit and non-transparent provision of private benefits to the public official” (Kaufmann et al 2000). A number of specific activities that fall within the definition of state capture include: the sale of parliamentary votes to private interests; the sale of civil and criminal court decisions to private interests; corrupt handling of central bank funds; and illegal contributions by private actors to political parties. All forms of state capture are directed towards extracting rents from the state for a narrow range of individual, firms, or sectors through distorting the basic legal and regulatory framework with potentially enormous losses for the society at large. State capture thrives where economic power is highly concentrated, countervailing social interests are weak, and the formal channels of political influence and interest intermediation are under-developed.

Although the definition of corruption outlined above appears too general, it has the advantage of being able to capture a wide dimension of corruption rather than restricting the scope of corruption to payment of bribes, as is traditionally understood. The latter ignores other aspects of corruption with perhaps far greater economic ramifications. For instance, a public employee who claims to be sick but goes on vacation is abusing his or her public position for personal use. This person is engaging in an act of corruption (petty corruption) even though no bribe is paid. Likewise, a cabinet minister who authorizes the building of an airport in his or her hometown may be engaging in an act of corruption (grand corruption) that does not involve the payment of a bribe. Thus, given the multifaceted nature of corruption, it is appropriate to adopt a wide definition of corruption, such as the one proposed above.
Causes of Corruption

The causes of corruption are numerous and complex. According to the World Bank’s 1997 World Development Report, causes of corruption include:

- Where public officials have wide discretion and little accountability;
- Inappropriate policy environment, e.g., distorted prices;
- Lack of checks and balances (e.g., weak watchdog agencies);
- Weak enforcement mechanisms (e.g., lack of judicial independence, weak prosecutorial institutions); and
- Where the benefits of corruption are greater than the consequences of being caught and disciplined (e.g., where public sector salaries are low).

These determinants of corruption are more or less captured by the formulation developed by Klitgaard (1988), which states that corruption tends to follow a formula:

\[ C = M + D - A \]

i.e., corruption (C) equals monopoly (M) plus discretion (D) less accountability (A). This formulation implies that corruption is most likely to occur when someone has monopoly power over a good or service, has the discretion to decide who receives it and what amount, and there is an absence of accountability. The existence of various government regulations and authorizations, such as the granting of import licences or tax incentives, gives a kind of monopoly power and discretion to the authorizing officials. Officials can exploit these powers to extract bribes by threatening to refuse the authorization or simply delay a decision.

To the extent that governments are the prime architects and implementers of their own policies, rules and regulations, they are in effect monopolists with full discretionary powers over how those policies, rules and regulations are applied. This
renders the actions of government officials highly susceptible to abuse, or more specifically, to distortions by corruption. A good illustration of this point is in the distribution of public revenues between current expenditures and capital investments. While much current government spending (e.g., wages, statutory payments, etc) reflects to a large extent explicit or implicit entitlements which allow limited discretions to the politicians, capital spending is largely discretionary. In most cases, politicians or high rank officials have considerable influence over decisions determining the size of the public investment budget, the composition of that budget, the choice of specific projects and their locations, and even the size and design of each project. Examples of corruption involved in these decisions abound.

It is not uncommon to hear, for example, cases where politicians steer major projects towards their home districts, not for economic reasons but for their own benefit (e.g., because they want to maximize their chances of being re-elected to parliament). Likewise, it is not uncommon to hear cases of bureaucrats awarding contracts on major public projects to certain private firms, not on the basis of the qualities and track records of those firms but on the basis of the amount of “commissions” that these firms are willing to pay the bureaucrats. In other cases, a company may be granted tax incentives or a subsidy because the minister responsible is one of the major shareholders in that company. Thus, consistent with Klitgaard’s formulation for corruption above, too much discretion and monopoly power over public goods and services, without adequate control mechanisms, breeds corrupt practices.

The taxonomy implied in the Klitgaard formulation above is important, as it points to interventions that can curb corruption in the public sector. As discussed in Chapter 9, successful strategies to curb corruption will have to simultaneously seek to reduce an official’s monopoly power (e.g., by market-oriented reforms), discretionary
power (e.g., by administrative reform), and hence increase accountability (e.g., through watchdog agencies).

Effects of Corruption

The effects of corruption on the economy can be thought of in terms of the distortionary effects on the allocation of resources (i.e., the extent to which economic activity is rendered less efficient) and the disincentive effects (i.e., the degree to which risk and uncertainty are introduced into the economic environment and thereby deter prospective economic activities, especially investment. A number of empirical studies that have been carried on the effects of corruption on economy have shown that corruption is detrimental to economic growth and development. Moreover, these studies have shown that the deleterious effects of corruption operate through various channels. These channels include reduced private domestic investment (Knack and Keefer 1995, Poirson 1998), reduced foreign direct investment (Wei 1997), overblown government expenditure, and distorted composition of government expenditure (Mauro 1998, and Tanzi and Davoodi 1997).

A classical example of the distortionary effects of corruption in the public sector is in the allocation of public resources. Because in corrupt environments projects are more likely to be selected on the basis of their bribe-generating capacity rather than for their productivity, the composition of public investment is likely to be skewed toward those projects that are highly susceptible to bribery and for which the payment of bribery is not easy to detect. These types of projects would include hi-tech projects and capital-intensive projects such as infrastructure and buildings. This policy bias has two important implications. First, higher spending on capital projects
reduces the resources available for other spending, resulting in the curtailment of more critical items such as “operations and maintenance”, or education. Second, maintenance and repair of existing infrastructure may be intentionally reduced so that physical infrastructure will deteriorate quickly to the point where it will need to be rebuilt, thus allowing the decision-makers the opportunity to extract another commission from the enterprise that will undertake the project. The ultimate outcome of all this is a public investment program that is greatly distorted, qualitatively and compositionally, and therefore counterproductive to economic growth.

In short, the costs of corruption accrue in three main areas: waste of resources (e.g., expenditure on politically-motivated projects); distortion of allocation (bias towards capital expenditure at the expense of more critical sectors such as health and education); and the curtailment of economic activities (e.g., reduced private investment). It should be noted, however, although almost impossible to value accurately, the indirect costs of corruption can often dwarf its direct costs. For instance, corrupt decisions can suppress legitimate entrepreneurial activities, or cause public safety to be endangered due to sub-standard products and workmanship.

Before leaving this section, it is worth mentioning that not all economists view corruption in the same light. There have been some economists, such as Becker and Maher (1986), Lien (1986) and Lui (1985), who have found some redeeming values in corruption. These economists take the view that corruption can be growth-enhancing because it removes government-imposed rigidities that impede investment and interfere with other economic decisions favourable to growth. In the view of these economists, corruption “oils the mechanism” or “greases the wheel” of development – so-called “virtuous corruption”. This is in contrast to the view, discussed above, that

25 See Goudie and Stasavage (1999) for a selected list of these studies and their findings.
sees corruption as “sanding the wheels”, mainly by lowering the security of property rights and misallocating resources.

While there may be some short-term merit in this pro-corruption view, it ignores the fact that these inefficiencies are the product of corruption rather than initiators of corruption. That is, most of these inefficiencies are deliberately created for corrupt or rent-seeking purposes. As such, it remains doubtful whether this is sustainable in the long run. For example, the use of bribes to accelerate the paper work of officials may prove effective for one transaction, but if the practice spreads to encompass all transactions, the net effect on efficiency is probably zero: the productivity of the official remains unchanged and efficiency may not be enhanced through any re-ordering of the queue. Thus, the growth-enhancing effects of corruption, if any, are not sustainable over the long haul.

III THE MODEL

Modeling corruption is a very difficult task given its complex nature. While the empirical studies referred to above provide useful insights into the relationship between corruption and economic growth, they lack a rigorous theoretical framework capable of generating testable predictions relating to the variables under consideration. The few researchers whose analysis is based on a formal theoretical model include Ram (1993), Ades and Di Tella (1997), Johnson, Kaufmann and

26 Some countries, notably the South East Asian countries, have tolerated high levels of corruption and continued to maintain respectable rates of economic growth. This may be because corruption in these countries is well-ordered, centralized and predictable. Also, it could be that corrupt money remains in the country and invested in productive economic activities. However, this does not necessarily mean that corruption is beneficial to growth. Higher economic growth rates result from an array of factors and the simultaneous prevalence of corruption does not imply anything about its value to economic growth.
Zoido-Lobaton (1998), and Leite and Weidmann (1999). The model used in this section is largely drawn from the Leite-Weidemann (LW) model, which is an open-economy version of the infinite-horizon growth model.

Central to the working of the LW model is the assumption that all investment projects need administrative approval which can only be granted after firms pay a bribe, or some form of commission, to the authorizing agent. The other assumptions of the model basically follow those in the standard infinite-horizon growth models. As in these growth models, the key players in the economy are households (which include the government) and firms.

**Households**

There are two types of households in this model: government employees \((L_g(t))\) and private sector employees \((L_p(t))\). The government employees comprise proportion \(s\) of the total population \(L(t)\) at time \(t\). Assuming a constant population growth rate of \(n\) forever and normalizing the number of adults at time 0 to unity, the total population in the economy at time \(t\) is \(L(t) = e^{nt}\), and the total number of public employees is \(L_g(t) = se^{nt}\), referred to hereafter as simply households for notational simplicity.

Suppose the households’ intertemporal utility is represented by:

\[
U = \int_0^T u(c_t) e^{-(\rho-n)t} dt \tag{1}
\]

where \(u(c_t)\) is utility at time \(t\) and is increasing and concave in \(c\), and satisfies the Inada conditions, \((u'(c) \to \infty \text{ as } c \to 0, \text{ and } u'(c) \to 0 \text{ as } c \to \infty)\). The rate of time
preference (the household’s discount rate) \( \rho \) is positive, constant and greater than the constant population growth rate \( n \). This condition is imposed to ensure that the household’s intertemporal \( U \) is bounded.

Both types of households earn wages and interest income from their labor and investment at the exogenous market rates \( w_t \) and \( r_t \), respectively. Government employees, however, have an additional source of income, namely, the bribe payments which they impose on the investing firms. To make the analysis tractable, it is assumed that the bribe payment is a fraction \( \phi \) of gross investment \( I = \dot{K} + \delta K \).

Assume also that the corrupt government employee would be penalized by an amount \( z \) in the event of being caught. The probability of the corrupt bureaucrat being detected and punished is \( P \), which is increasing with the extent of corruption \( \phi \) and the monitoring technology of society \( M \). That is, \( P = P(\phi, M) \), \( \partial P / \partial \phi > 0 \), \( \partial P / \partial M > 0 \). If \( P \) is a linear function of the extent of corruption \( \phi \), we can rewrite the expression as \( P = P(1, M)\phi \) so that \( \partial P / \partial \phi = P(1, M) \) which is independent of \( \phi \). For use in the ensuing analysis, let \( P = 1 - P \) denote the likelihood of not being detected.

To express gross investment in per government employee terms, recall that the number of government employees \( L_g(t) \) at time \( t \) is a fraction \( s \) of the total population \( L(t) \) i.e., \( L_g(t) = sL(t) \). Gross investment per government employee is thus:

\[
\frac{\dot{K} + \delta K}{L_g(t)} = \frac{\dot{K}}{sL(t)} + \frac{\delta K}{sL(t)} = \frac{\dot{K}}{sL(t)} + \frac{\delta k}{s} = \frac{\dot{k} + (n + \delta)k}{s}
\]

since \( \frac{\dot{K}}{L(t)} = \dot{k} + nk \).
Putting all these together, the expected flow budget constraint facing the government employee is thus

\[
\dot{a} = w + ra + \frac{\phi P(\phi, M)}{s} [k + (n + \delta)k] - [1 - P(\phi, M)]z - c - na
\]  

(2)

where \( a \) denotes the household’s total assets, domestic and foreign.\(^{27}\) Equation (2) says that the increase in the per capita asset equals the sum of the three income types less the expected penalty in the event of being caught, per capita consumption and an adjustment term for population growth.

To eliminate the possibility of government employees choosing a path along which \( a \to -\infty \), the following transversality condition is imposed:

\[
\lim_{t \to \infty} \left\{ a(t) \exp \left[ - \int_0^t (r(v) - n) \, dv \right] \right\} \geq 0
\]  

(3)

This condition simply says that households cannot borrow forever to finance their consumption such that \( a(t) \) becomes negative.

The objective of the household is to maximize its objective function in (1) subject to (2) and (3) above. Forming the present-value Hamiltonian function, we have

\[
H = u(c) e^{-(\rho+n)t} + v \left[ w + ra + \phi P \left( k + (n + \delta)k \right) - (1 - P)z - c - na \right]
\]  

(4)

The necessary first-order conditions for a maximum are as follows:\(^{28}\)

\(^{27}\) As in Barro and Sala-I-Martin (1995), \( a \equiv k - \bar{b} \), where \( \bar{b} \) is the amount of debt the household incurs to finance consumption.

\(^{28}\) Setting \( P = 1 - \bar{P} \) where \( \bar{P} = \bar{P}(1, M) \phi \) and substituting into (4) yields

\[
H = u(c) e^{-(\rho+n)T} + v \left[ w + ra + \phi \frac{\bar{P}(1, M)}{s} \left( \frac{k + (n + \delta)k}{s} \right) - (\bar{P}(1, M) \phi)z - c - na \right]
\]

Differentiating this with respect to \( \phi \) yields Equation (7).
\[
\frac{\partial H}{\partial c} = 0 \Rightarrow v = u'(c)e^{-(r-n)t} \tag{5}
\]

\[
\dot{v} = -\frac{\partial H}{\partial a} = -(r-n)v \tag{6}
\]

\[
\frac{\partial H}{\partial \phi} = 0 \Rightarrow \phi^* = \frac{1}{2\bar{p}(1,M)} - \frac{zs}{2(k+(n+\delta)k)} \tag{7}
\]

Equations (5) and (6) are the standard results for the optimal consumption path. If we were to assume a constant intertemporal elasticity of substitution (CIES) functional form for the household’s utility function, i.e., by letting \[ u(c) = \frac{c^{1-\theta} - 1}{1-\theta} \]
where \( \theta > 0 \), then, from equations (5) and (6), the following standard results for the optimal consumption growth path (the Euler equation) is obtained:

\[ \frac{\dot{c}}{c} = \frac{1}{\theta}(r-\rho) \tag{8} \]

According to this expression, the relation between \( r \) and \( \rho \) determines whether households choose a pattern of per capita consumption that rises over time \( (r > \rho) \), falls over time \( (r < \rho) \), or remains constant \( (r = \rho) \). A lower willingness to substitute intertemporally (a higher value for \( \theta \)) implies a smaller responsiveness of \( \dot{c}/c \) to the gap between \( r \) and \( \rho \).

Equation (7) derives the optimal extent of corruption \( \phi^* \) for the government employee. It is not difficult to see from this equation the relationship between the extent of corruption and the variables on the right-hand side of the equation. An increase in the penalty \( z \), or in the monitoring effort \( M \), or a reduction in the concentration of power \( 1-s \) reduces the utility maximizing extent of corruption for the bureaucrat. On the other hand, an increase in the capital stock, for example
because of the booming capital investment by government, has the opposite effect of increasing the extent of corruption.

**Firms**

On the production side, it is assumed that firms produce the economy’s single good \( Y \) with a typical neoclassical production function characterized by diminishing marginal products, constant returns to scale, and satisfying the Inada conditions.

\[
Y = F(K, L)
\]  
\hspace{1cm} (9)

The change in capital stock over time is given by the following expression

\[
\dot{K} = I - \delta K
\]  
\hspace{1cm} (10)

where capital depreciates at a constant rate \( \delta \). The firm’s net cash flow is defined as the sale proceeds net of wage payments and investment costs:

\[
\Pi = F(K, L) - wL - CI
\]  
\hspace{1cm} (11)

where \( CI \) equals the physical cost of investment plus the “unavoidable” bribe payment, i.e.,

\[
CI = I(1 + \phi)
\]  
\hspace{1cm} (12)

The firm’s objective is to maximize the present value of the net cash flows in (11) between time 0 and infinity subject to (10) and the initial capital stock \( K > 0 \). Forming the present value Hamiltonian function, we have

\[
J = e^{-\rho(t)} \{ F(K, L) - wL - I(1 + \phi) \} + \nu(I - \delta K)
\]  
\hspace{1cm} (13)
where \( \bar{r}(t) = \left( \frac{1}{t} \right) \int_{0}^{t} r(v) dv \), i.e., the average world interest rate between time 0 and infinity. \( v \) is the shadow price associated with installed capital in units of time 0 utils, i.e., the present-value shadow price of installed capital. The current-value form of (13) is

\[
\dot{H} = \{ F(K, L) - wL - I(1 + \phi) \} + q(I - \delta K)
\]

(14)

where \( q = ve^{\bar{r}(t)} \) is the current-value shadow price of installed capital at time \( t \) in units of time-\( t \) utils, i.e., \( q \) is the price of capital in terms of current utility.

The first-order conditions, using (14), are as follows:

\[
\frac{\partial \dot{H}}{\partial L} = 0 \Rightarrow F_{L}(K, L) = f(k) - kf'(k) = w
\]

(15)

\[
\frac{\partial \dot{H}}{\partial I} = 0 \Rightarrow q = (1 + \phi)
\]

(16)

\[
\dot{q} = -\frac{\partial \dot{H}}{\partial K} + q\bar{r}(t) = -\{f'(k) - \delta q\} + q\bar{r}(t) \Rightarrow \dot{q} = (r - \delta)q - f'(k)
\]

(17)

Equation (15) is the standard result equating the marginal product of labor to the wage rate, which holds since it is assumed that corruption does not affect the productivity of labor. Equation (16) is an interesting result. Recall that when \( q = 1 \), it implies that the market value of the investment equals its replacement cost, or, equivalently, that the shadow price of capital is equal to its unit cost. With the presence of corruption, this equality no longer holds with \( q > 1 \) since \( \phi > 0 \). We can rearrange equation (17) to yield

\[
r = f'(k)/q - \delta - \dot{q}/q,
\]

which differs from the conventional result \( r = f'(k) - \delta \) by the terms in \( q \). (If corruption were absent so that \( q = 1 \), then with \( \dot{q} = 0 \) this expression would reduce to the conventional result). This implies that the steady-state capital stock will be lower in the presence of corruption.
From equations (7) and (16), the equation of motion for $k$ can be derived as a function of the model’s parameters and the shadow price $q$:

$$\dot{k} = \frac{z_\delta \bar{P}(1,M)}{2\bar{P}(1,M)(1-q) + 1} - (n + \delta)k$$

Equations (17) and (18) form a system of two differential equations in $q$ and $k$. Together with the initial condition $k(0) > 0$ and the transversality condition in (3), it determines the time path of $q$ and $k$. At steady state $\dot{k} = 0$ which, from equation (18) above, implies a value for $q$ as follows:

$$q = 1 + \frac{1}{2\bar{P}(1,M)} - \frac{z_\delta}{2(n + \delta)k}$$

Thus, the value of $q$ exceeds 1 for $k > \frac{z_\delta \bar{P}(1,M)}{(n + \delta)}$. A higher $q^*$ is tantamount to a lower steady-state capital stock $k^*$.

**The Dynamics**

Figure 6.1 illustrates the steady state and transitional dynamics of the system based on the above results. This phase diagram highlights one distinguishing feature that is fundamentally different from conventional models. That is, the $\dot{k} = 0$ isocline is no longer horizontal through $q^*$ and thus shifts in the $q = 0$ curve would no longer leave the $q^*$ unaffected. This non-linearity follows from equations (7) and (19) where it is shown that the increase in $k$ leads to higher levels of corruption and hence higher $q$.

*Figure 6.1: A Small Open Economy with Corruption*
It is straightforward to show that the system exhibits saddlepath equilibrium by linearizing equations (17) and (18) around the steady-state values for $k$ and $q$, and showing that the determinant of the coefficient matrix is negative. The thick solid line depicts the stable path. All other paths are unstable and diverging in the sense that they violate the transversality condition and the household’s budget constraint, and are hence inconsistent with the dynamic optimization path of the households.

It is useful also to demonstrate the effects of fighting corruption, be it through monitoring $M$, or enhanced incentive schemes $z$. As shown in Figure 6.2 below, both policies lead to a reduction in the steady-state shadow price of capital $q^*$ and an increase in the steady-state capital stock $k^*$, and hence steady-state output. The different impact of the two policies stems from the fact that an increase in $M$, in raising the likelihood of being caught, leads to two separate effects: a reduction in the expected bribe payment and an increase in the expected penalty. As the bribe payment relative to $k$ increases with $k$, the potential loss for the corrupt government employee through enhanced monitoring is relatively higher for large $k$. On the other hand, an increase in the penalty ($+z$) does not provide sufficient disincentives to the corrupt bureaucrat and is more likely to lead to higher bribery payments charged by the bureaucrats to compensate for the increase in penalty. This explains why the $+z$ curve tends to be steeper than the $+M$ curve.
Another noteworthy feature of the model is how the impact of the two anti-corruption policies relates to the state of economic development or, more precisely, to the capital intensity of the economy. This is illustrated in Figure 6.3 below.
Economy A is characterized by low values of steady-state $q$ and $k$, typical of a developing economy, and economy B is characterized by high values of steady-state $q$ and $k$ as in a typical developed economy. As demonstrated in the diagram, the increased penalty generates a larger increase in the steady-state capital stock, and thus steady-state output, in the developing economy than the improved monitoring technology, whereas the opposite is true for the developed economy. This implies that a decision on which anti-corruption measure to employ must take into account the level of development of the economy.

Finally, Figure 6.4 below demonstrates the economic effects of increased public investment in a corrupt environment. Since the increase in government expenditure can be viewed in this model as having the same effect as a positive technology shock (Barro and Sala-I-Martin, 1995), it causes the $\dot{q} = 0$ curve to shift outwards.

**Figure 6.4: Corruption and Public Investment**

![Diagram](image)

The outward shift in the $\dot{q} = 0$ curve results in the increase in the steady-state values of $k$ and $q$, from $k_0^*$ to $k_1^*$ and from $q_0^*$ to $q_1^*$, respectively. Because of the presence
of corruption, the effect of such an increase in public expenditure is lower than when
corruption is absent. As already explained, without corruption the $\dot{k} = 0$ curve would
be a horizontal line through $q_0^*$ and the outward shift of the $\dot{q} = 0$ curve would leave
$q^*$ unaffected, and the steady-state per capita capital stock would have increased to
$k^*_R$ instead of $k_1^*$. Due to the curvature of the $\dot{k} = 0$ curve, the negative impact of
corruption differs depending on the initial steady state with the effect being more
pronounced in less capitalized economies (i.e., the developing economies).

IV EMPIRICAL IMPLICATIONS

The foregoing analysis on the dynamics of the system highlights some
important relationships that allow the formulation of testable hypotheses about the
symbiosis between corruption and the economic variables under consideration. The
most pertinent hypotheses include the following:

Hypothesis 1: Corruption negatively affects economic growth through its
distortionary effect on the productivity of public capital.

Hypothesis 2: Other things being equal, public investment is tied to the level
of corruption. The corollary is that, because of the low productivity of public
investment due to the presence of corruption, private investment tends to be
negatively correlated with the level of public investment;

Hypothesis 3: Other things being equal, the size of the public sector tends to
be closely related to the level of corruption within the public sector.
These hypotheses form the basis of the empirical tests in Chapter 8 (with minor amendments to suit the context of the Pacific Island economies) in conjunction with the main hypothesis of the study posited in Chapter 1. As already pointed out, the biggest challenge facing empirical analysis in this area of study is the task of developing measures of the effectiveness of institutions that are more objective and can be applied to any country. This issue is addressed in Chapters 7 and 8.

V CONCLUDING REMARKS

The argument advanced in this chapter is that corruption, viewed as a fundamental failure of governance and institutions, hinders economic growth and development. In the context of the theoretical model developed in Section III above, corruption in the public sector retards economic growth by distorting the quality and composition of public investment and thereby reducing its effectiveness and productivity. This brings into question the unqualified endorsement of the so-called “golden rule” that advocates higher investment in capital projects, as opposed to increases in recurrent expenditures, to promote growth and development. This also brings to the fore the need to examine analytically not only the size and scope of capital expenditure but also, and more importantly, the effectiveness and efficiency with which public capital is deployed by governments. Indeed, how well we use capital is more important than how much capital we have.
CHAPTER 7

ALTERNATIVE MEASURES OF INSTITUTIONAL EFFECTIVENESS

Introduction

Measuring the level and quality of institutions is a difficult task. As discussed in the text, the three indicators of institutional effectiveness used in the study are the levels of corruption, property rights security, and civil liberty. However, the fact that we may be able to identify these key indicators of institutional effectiveness does not make this measurement task any easier. This is because of the abstract nature of these proxy variables which still leaves unresolved the problems of measurement.

Although, as discussed in Chapter 4, a plethora of qualitative measures have been developed by various risk-rating organizations, these measures have shortcomings. First, they are too fragmented in the sense that they focus on various aspects of the same underlying problem – the governance or institutional problem. Accordingly, these different measures/indices are likely to be highly correlated with each other, posing problems for empirical analyses. Second, these measures are based on the perceptions of the experts carrying out the surveys or the people being surveyed and, therefore, are subject to subjectivity and bias. Finally, these indices only cover a limited number of countries, understandably because of the expensiveness of the surveys or expert opinion polls involved. This means that, in the absence of alternative measures, a study of the role of institutions in countries (including the Pacific Islands – the subject matter of this study) other than those covered by these indices cannot be easily undertaken.
It is the purpose of this chapter, therefore, to fill this void by proposing alternative approaches to the construction of aggregate indicators of the level and quality of institutions. The aim is to derive an aggregate measure of the quality of institutions that is directly measurable and that can be easily applied to any country. Although the aggregate indicators are not as precise as one might have hoped, they are nevertheless much more reliable than any individual indicator (as much as a consumer price index (CPI) based on a basket of several goods is a more realistic indicator of the level of inflation than a CPI based on one commodity only). There are four indexation approaches worth considering for the construction of these aggregate measures of institutions: the *unobserved component* approach as used by Kaufmann *et al* (2000); the *geometric mean index* approach as applied by Hufter and Shah (1999); the *contract-intensive-money* approach as used by Clague *et al* (1999); and the *principal component analysis* approach.²⁹ The last approach is a major contribution of the present study.

The remainder of the chapter proceeds as follows. The next section, Section II, briefly examines the four approaches referred to above, and evaluates their applicability with respect to the development of a composite institutional measure. For the reasons explained below, the principal component analysis (PCA) approach is the recommended approach. Section III examines in greater detail the principal-component-analysis methodology, and shows how it is applied to construct a composite corruption index, which is used in the empirical part of the study (Chapter 8). Finally, the concluding remarks are contained in Section IV.

²⁹ The contract-intensive-money approach is not necessarily an aggregation approach, but it is included for completeness and because it is used in the empirical part of the study.
APPRAOCHES TO CONSTRUCTING THE COMPOSITE INSTITUTIONAL MEASURES

The construction of composite measures of the quality of institutions is not an easy task, and this is reflected in the small number of aggregate institutional measures that have been developed so far in the literature. The technique that has been widely used in the construction of composite indices is to focus on the key observable aspects of the institutional environment and then derive an aggregate index based on these constituent variables. Choosing these component variables, however, is often an arbitrary process and made more problematic by the difficulty in identifying those components of institutions that are critical to economic growth and development, as opposed to those that are not. Moreover, often the lack of data on these variables compounds this problem, resulting in ad hoc selection of the variables comprising the underlying composite index.

As already mentioned, the four indexation approaches considered for the purpose of constructing a composite institutional measure are: the unobserved component approach, the geometric mean approach, the contract intensive money approach; and the principal component analysis approach. There are four main advantages of the aggregation approaches. First, they are based on a methodology that provides a consistent framework for placing data from various sources into common units. Second, the aggregate indicators span a much larger sample of countries, permitting comparisons across a much larger set of countries than is possible using any single indicator. Third, the aggregate indicators are more precise measures than any individual indicator. This is because aggregation can iron-out or offset the statistical biases or measurement errors in the variables chosen. Finally, it is possible to construct qualitative measures of the precision of both the aggregate governance
indicators and their components, allowing formal testing of hypothesis regarding cross-country differences in the level of institutions. It must be emphasized, however, that despite their strengths, the composite indices remain imperfect indicators of the problem they are designed to measure and they must always be used with care in empirical work.

The Unobserved Components Model

This approach was used by Kaufmann, Kraay and Zoido-Lobaton (KKZ) to construct an aggregate governance indicator based on a wide range of indicators from different sources. KKZ illustrated the unobserved components approach with reference to three fundamental aspects of governance: rule of law; government effectiveness; and craft. They grouped 31 indicators constructed in 1997 and 1998 into three clusters corresponding to these three concepts of governance, and compute aggregate indicators spanning up to 166 countries. These indicators were drawn from 13 different sources, and thus differed along several dimensions. Despite this heterogeneity, KKZ took the view that within each cluster, each of these concepts is an imperfect indicator of the corresponding broader concept of governance.

The unobserved components (UC) model expresses the unobserved data as a linear function of the observed governance plus a disturbance term capturing perception errors and/or sampling variation in each indicator. Expressed algebraically,

$$Y_{j,k} = \alpha_k + \beta_k (g_j) + \epsilon_{j,k}$$

30 The few other researchers that have developed and used aggregate indices in their studies, apart from the ones mentioned in the chapter, include Mauro (1995) and Rodrik (1999).

31 Refer to Kaufmann et al (2000) for a more detailed exposition of this model.
Where \( g_j \) denotes an unobserved index of one of the indicators of governance, e.g. rule of law, bureaucratic efficiency and effectiveness, and corruption, in country \( j \). \( Y_{j,k} \) is the observed score of country \( j \) on indicator \( k \); \( \alpha_k \) and \( \beta_k \) are unknown parameters which map unobserved governance \( g_j \) into the observed data \( Y_{j,k} \). The disturbance term \( \varepsilon_{j,k} \) captures two sources of uncertainty in the relationship between true governance and the observed indicators. First, the particular aspect of governance covered by indicator \( k \) is imperfectly measured in each country, reflecting either perception errors on the part of the experts (in the case of a poll of experts) or sampling variation (in the case of surveys). Second, the relationship between the particular concept measured by indicator \( k \) and the corresponding broader aspect of governance may be imperfect. The model is based on three key assumptions: (1) that the measurement errors in individual indicators of governance are uncorrelated across indicators; (2) that the relationship between unobserved governance and observed indicators is linear; and (3) that the distribution of unobserved governance across countries is normal.

From Equation (1), KKZ computed the mean of the unconditional distribution of governance, given the observed data for each country, and used it as an estimate of the level of governance in that country. In like manner, they computed the variance as an estimate of the precision of the aggregate governance measure for each country. If the parameters \( \alpha_k, \beta_k \) and \( \sigma_e(k)^2 \) were known, an obvious way to estimate \( g_j \) would be to re-scale the observed scores by subtracting \( \alpha_k \) and dividing by \( \beta_k \), and then construct a weighted average of these re-scaled scores:
\[
\hat{Y}_{j,k} = \frac{Y_{j,k} - \alpha_k}{\beta_k} = g_j + \varepsilon_{j,k}
\]  

However, these parameters are unknown for every indicator and, therefore, in order to compute the mean and the variance of \( g_j \), these unknown parameters need to be estimated first. KKZ got around this by exploiting the assumption of normality of \( g_j \) and \( \varepsilon_{j,k} \) to write down the likelihood function of the observed data, and maximize this function with respect to \( \alpha_k, \beta_k \) and \( \sigma^2(k) \) to obtain estimates of the unknown parameters.

Despite the overly simplifying assumptions underpinning the model, the derived governance indicator did not produce the desired effects. In particular, although it was possible to identify statistically significant differences between countries at opposite ends of the distribution of governance, it was much more difficult to discriminate among the majority of countries with any degree of confidence. KKZ attributed this major shortcoming of their model to poor data.

**The Geometric Mean Approach**

This approach was adopted by Hufter and Shah (hereafter, HS) in their 1999 paper to construct a composite index for their own version of 'governance'. In developing this index, HS focused on four key observable aspects of governance as follows: citizen voice and exit; government orientation; social development; and economic management (see Box 7.1 below).
These four composite indices were chosen to provide an indication of the government's ability to (1) ensure political transparency and voice for all citizens; (2) provide efficient and effective public services; (3) promote the health and well-being of its citizens; and (4) create a favorable climate for stable economic growth.

The procedure for the construction of a composite index based on this approach is quite straightforward. HS first constructed the indices for each of these four components of governance. Then, they constructed the overall composite index of governance quality based on these four sub-indices. In algebraic terms, the index of the governance quality (GQI) is:

$$GQI = CP^{\alpha_1} \times GO^{\alpha_2} \times SD^{\alpha_3} \times EM^{1-\alpha_1-\alpha_2-\alpha_3}$$

Where:

- $CP = PF^\theta \times PS^{1-\theta}$
- $GO = RT^{K_1} \times CO^{K_2} \times JE^{1-K_1-K_2}$
- $SD = HD^{\gamma} \times GI^{1-\gamma}$
- $EM = OO^{M_1} \times CB^{M_2} \times DB^{1-M_2-M_3}$

The exponents $\alpha$, $\theta$, $K$, $\gamma$, and $M$ are weights indicating relative importance of the components to overall governance assessment.
The assignment of appropriate weights for each category is a subjective and sensitive issue. For example, should a government that creates a favourable economic climate but lacks political freedom be judged a higher or lower quality government than one that provides political freedom but hinders economic growth? HS circumvented this dilemma by allocating equal weights to the constituent variables. Equal weighting means that potential biases or errors do not unduly influence the composite index.

Like the unobserved-components model, the efficacy of the HS model depends critically on the quality of data used in the analysis. For example, does the better availability of data from developed countries mean that these countries, as a group, are rated higher or lower than the least developed countries?

The Contract-Intensive-Money (CIM) Approach

The contract-intensive-money (CIM) index was first introduced by Clague, Keefer, Knack, and Olsen in their 1999 paper as an indicator of the quality of state institutions. The authors defined the CIM index as the ratio of non-currency money to total money supply (M2). In the view of these researchers, the financial portfolio holdings of nationals is a good indicator of the effectiveness of institutions in protecting property and contractual rights. The rationale is that if institutions cannot provide assurance for the security of property rights (e.g., in terms of adequate third party enforcement), nationals would be less likely to allow other parties to hold their money in exchange for some compensation, and hence CIM would be correspondingly lower. That is, they would prefer to hold their financial assets in the form of cash (rather than depositing them, for example, with the banks). The higher the CIM, the greater the ability of firms to raise capital, the higher the rate of
investment, and hence the faster the rate of economic growth. The authors tested these propositions based on cross-country data and the results were consistent with these predictions.

To observe the relevance of the CIM index in the case of the PICs, it is of interest to illustrate the index graphically using data for Fiji and Papua New Guinea – the two countries in the Pacific with the most severe institutional problems.

![Graph showing CIM ratio for Fiji (1970-98)](source: ADB (1998b))

**Figure 7.1: The CIM Ratio for Fiji (1970-98)**
(Source: ADB (1998b))

As can be seen from the Fiji CIM ratio in Figure 7.1 above, there is clearly a drop in the CIM index during the period of the coup and the year immediately after it (1987-1988). This squares well with the prediction that if CIM is a good measure of the security of contract and property rights, dramatic political events or changes of regime affecting these rights should change the CIM ratio.

The CIM ratio for Papua New Guinea based on quarterly data covering the period 1998-2001 is shown in Figure 7.2:
The quarterly data refers to the 3-month average for each quarter.

The hollow portion of the CIM ratio from the first quarter 1998 to end 1999 was the period when the Papua New Guinea economy was devastated by gross mismanagement and political instability under the Skate administration. These problems led to a record decline in the value of the kina against the major currencies, precipitating bank panics and a massive outflow of capital. The economy slowly recovered when the Mourata government took over in the third quarter of 1999, as reflected by improvement in the CIM ratio during the subsequent periods.

Thus, both the Fiji and Papua New Guinea data support the hypothesis that where there is increased political uncertainty, and the propensity to mount coups is high, the security of property and contractual rights is hampered, leading to lower
confidence by investors in the banking system and enforceability of contracts, and thereby giving rise to capital flight.

The Principal Component Analysis (PCA) Approach

An approach that can be usefully applied to the construction of an aggregate measure of the effectiveness of institutions is the Principal Components Analysis (PCA) methodology. By construction, the PCA methodology is, with certain caveats, analogous to the Hufter and Shah model described above, and therefore the two measures should be closely related. As already mentioned, this study uses the PCA approach in the construction of its aggregate measure of institutional quality.

The PCA methodology is a statistical technique that seeks to linearly transform an original set of variables into a substantially smaller set of uncorrelated variables that represents most of the information in the original set of variables. Thus, if the variables in the variable set are correlated, and especially if they are highly correlated, then one can linearly transform the $p$-correlated variables into a relatively small set of $k$ uncorrelated variables. The goal is to derive the $k$ set of variables that will maximize the variance accounted for in the original $p$ variables. The $k$-derived variables are called the “principal components”. For example, if three principal components account for most of the variance in an original set of 20 job satisfaction measures, then we have in effect reduced the dimensionality of the data set from 20 correlated dimensions to three uncorrelated dimensions and thus considerably simplified the structure of the job satisfaction variable domain.

32 PCA should be distinguished from Factor Analysis. PCA focuses on explaining the total variation in the observed variables on the basis of the maximum variance properties of principal components. Factor analysis, on the other hand, focuses on explaining the common variance in the observed variables on the basis of a relatively few underlying factors.
The number of principal components depends on the degree of correlation amongst the variables in the variable set. If there are no exact linear dependencies among the \( p \) variables, then there are as many principal components as there are variables. On the other hand, if there are exact linear dependencies (i.e., any one variable in the variable set can be written as an exact linear combination of one or more of the remaining variables), then the variables are redundant since one or more variables can be dropped from the variable set without any loss of information. One can perfectly predict the values of the excluded variables from the remaining variables. When there are exact linear dependencies, the dimensionality of the variable space is accordingly reduced. The number of principal components is equal to the dimensionality of the variable set.\(^{33}\)

Expressed algebraically, suppose there are \( n \) variables in the variable set, then the first two principal components are derived as follows:

\[
l_1 = a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5 + a_6x_6 + \ldots + a_nx_n
\]

\[
l_2 = b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + \ldots + b_nx_n
\]

Note that the \( a's \) (\( b's \)) are chosen so that variance of \( l_1 \) (\( l_2 \)) is maximized subject to the condition that \( a_1^2 + a_2^2 + \ldots + a_n^2 = 1 \) (called the normalization condition). \( l_1 \) is said to be the first principal component. It is the linear function of the \( x's \) that has the highest variance (the normalization is required, because otherwise this variance can be increased indefinitely). \( l_2 \), which is uncorrelated with \( l_1 \), is said to be the second principal component. Other linear combinations can be derived but, for

\(^{33}\)In most cases, the dimensionality of the variable space is equal to the number of variables since it is rare to encounter exact linear dependencies in data sets.
most empirical work, the first two principal components suffice. The random variables $x_n$ can be either deviation from mean scores or standard scores.

A word of caution on the limitations of the PCA is warranted at this point. First, the first principal component $l_1$, though it picks up the major portion of the variances of the $x'$s, need not necessarily be the one that is most correlated with the dependent variable. In fact, there is no necessary relationship between the order of the principal components and the degree of correlation with the dependent variable. Second, often the linear combinations have no meaningful economic interpretation.

**Which approach to use?**

Although the approaches outlined above differ in their ways of aggregating the variables for the purpose of constructing an overall index, they all have the same objective of reducing the dimensionality of the data set characterized by a large number of correlated variables. They do so by focusing on key observable aspects of the institution and/or governance dimension that are thought to capture most of the information contained in the set. It may not matter, therefore, which approach to use for the purpose of constructing a composite measure as long as the data on the constituent variables are available. It is important to note, however, the fundamental difference between these approaches. That is, the UC and HS aggregation approaches arbitrarily select the grouping of indicators into clusters while the PCA approach allows the data itself to select the principal components.

In constructing their aggregate index, both the unobserved components (UC) and the Hufter and Shah (HS) models rely on the qualitative institutional indicators produced by risk-rating agencies such as Transparency International (TI), Freedom
House, and Business Environment Risk Intelligence (BERI). However, as already explained, these indicators are qualitative and they do not cover most of the Pacific islands. As such, both the UC and HS models may be of little use for analysis of the institution-growth relationship in the PICs. For this reason, therefore, the study chose to apply the Principal Components Analysis methodology for the construction of its composite institutional measures/indices, in particular the corruption index as discussed below.34

III THE COMPOSITE CORRUPTION INDEX

In this section, a composite corruption index based on data is derived using the PCA methodology. For this purpose, the study uses data proxies relating to key public finance variables believed to be closely linked to corrupt or rent-seeking practices within the public sector. Identifying these constituent public finance variables is not an easy task, however, and some bold assumptions have to be made regarding their links to corrupt practices.

There are two options available that may assist in this identification process. The first option is to consider the fundamental and measurable determinants of corruption and use these determining variables as proxies for corruption in the regressions. This, in effect, is equivalent to endogenizing corruption. This approach is called the determinant approach. The second option is to consider the most likely

34 No attempt is made to construct the composite indices for property rights security and civil liberty – the other indicators of institutional effectiveness – because the CIM index (for property rights security) and Freedom House ratings (for civil liberty) are readily applicable to the PICs.
outcomes of corruption and use these variables as measures of corruption. This approach is designated the *outcome approach*.

**The Determinant Approach**

The determinants of corruption have been discussed extensively in the literature (e.g., Lamsdorff 1999). For the purpose of this study, the focus is mainly on the following directly measurable determinants of corruption: the wage level in the public sector, natural resource abundance (particularly minerals, forests and fisheries), the degree of ethnic heterogeneity in a country, and the extent of public sector ownership of firms. The argument is that if these fundamental determinants of corruption are present, the probability that corrupt behavior will eventuate is high.\(^{35}\) The results of the various empirical studies undertaken are consistent with this assessment.

On the *public wage* argument, van Rijckeghem and Weder (1997), testing for the existence of a relationship between the level of corruption and the level of civil service wages, found a significant, negative relationship. That is, the higher the civil service wage level, the lower is the level of corruption, *ceteris paribus*. The authors recognize, however, that not all officials respond in the same manner to the same incentives, and that anti-corruption measures based exclusively on wage increases could be very costly to the public purse and do not guarantee results. More recent studies of this relationship by Swamy *et al* (1999) and Treisman (1999) have arrived at ambiguous and mostly non-significant results.

---

\(^{35}\) These determining factors undoubtedly play an influential part in the construction of the perception measures for corruption by the private rating firms already mentioned.
On the natural resource abundance proposition, Leite and Weidemann (1999) advance the view that abundance of natural resources creates opportunities for rent-seeking behavior and thus gives rise to corruption. In one of their corruption regressions using exports of fuels and minerals (as a share of GDP) as a measure of natural resource abundance, they find a significant and positive relationship between corruption and natural resource abundance. However, conclusions drawn from this result must be treated with great caution.

On the question of ethnic heterogeneity, La Porta et al (1998) find that, in conjunction with other factors, countries that are ethno-linguistically heterogeneous exhibit inferior government performance, implying, among other things, the possibility of a corrupt government. This conclusion accords well with the experiences of most of the highly ethnically-fragmented countries in the developing world where ethnicity plays an influential role in the formulation of public policies and allocation of resources usually through discrimination against one or more of the ethnic groups.

Finally, the question of political and bureaucratic ownerships of firms as one of the key determinants of corruption in the public sector has not been fully investigated. However, it is not hard to see why corruption is likely to occur when politicians or high-level bureaucrats own shares in private firms or exercise control over government-owned companies. Shleifer and Vishny (1998) develop a theoretical model on the effects of political ownership in firms, postulating that such political ownership reduces efficiency, since it is likely to raise the demand for politically motivated resource allocation.
The Outcome Approach

The outcome-based approach looks at those public finance variables that are most likely to be the outcome of corrupt or rent-seeking policies. The variables considered are: the ratio of government consumption to GDP (GOVTC), the ratio of subsidy to GDP (SUBGDP) (and also the ratio of expenditure on subsidies to total government expenditure (SUBTE)), the ratio of government GDP to private GDP (ECSGDP) (and also the ratio of government expenditure on economic services to GDP (ECONTE)), the ratio of external debt to GDP (DEBT), and the variability of public capital expenditure as measured by its coefficient of variation (CAPCV).

What follows is a detailed description of each of these public finance variables, providing further clarification on why they could well be linked with corrupt or rent-seeking policies.

The GOVTC variable is regarded as an outcome of corrupt or rent-seeking practices to the extent that the components of this government expenditure item are highly susceptible to manipulation or appropriation by the policy-makers in pursuit of their private interests. Such components include overseas travel expenses, ministerial allowances, land rents, and other recurrent expenditure items, most of which are straight consumption expenditures with substantial pay-offs to the “beneficiaries”. For instance, the budgetary provision for overseas travels constitutes a major proportion of the recurrent budget in most of the Pacific countries. This is not because more overseas travel is required in a given year by more people but simply because more travel is required by the same people. (In some countries like Kiribati, there are close linkages between owning a private home and the number of overseas trips a person (an employee) has in a year). The presumption, therefore, is that the high level of expenditure on this variable implies a high level of corruption and/or rent-seeking
activities amongst government officials or politicians, especially where this expenditure is dominated by these rent-prone components.\textsuperscript{36}

While a number of studies (e.g., Barro 1990) have provided concrete evidence of the negative impact of government consumption expenditure and its components outlined here on economic growth, what remains unclear is the proposition that this expenditure item and its components are the product of corrupt motives on the part of government officials. This is the strong presumption pursued in the present analysis. It must be emphasized, however, that not all government consumption expenditure is inimical to growth. For instance, government consumption (recurrent) expenditure on maintenance of infrastructure, health and education has the potential to improve productivity and hence is growth-enhancing.

The \textit{SUBGDP} (or the \textit{SUBTE}) variable is regarded as the possible outcome of corrupt and rent-seeking practices in so far as this expenditure item is vulnerable to abuse by politicians and senior government officials for private gain. For instance, a subsidy may be granted to a company or industry not on grounds of social need but because of the pecuniary gains that the policy maker expects to derive from such resource transfer. This action may be motivated by the fact that the senior official or minister responsible owns shares in the company concerned, or perhaps the subsidized industry would benefit the politician’s constituency and hence such a subsidy could work to consolidate his or her power base in the electorate. In these circumstances, the redistributive role of the government suffers because program benefits or subsidies do not go to the most needy and most essential but to the best-connected. This has the potential to lower overall domestic investment. The study by Ades and Di Tella

\textsuperscript{36} This argument does not necessarily contradict the proposition pertaining to the public investment/corruption relationship since the \textit{GOVTC} variable is but only one of the components of the corruption index.
(1997) has shown a statistically significant and positive relationship between the levels of corruption and subsidy.

The *ECSGDP* (or *ECONTE*) variable is used as a proxy for the degree of government intervention in what would otherwise be private sector activities. The proposition is that such intervention is largely motivated by the rent-seeking opportunities that such activities present to the decision-makers. This is particularly true in the case of most of the Pacific countries where the government is the sole supplier of goods and services. By engaging in the provision of goods and services such as retailing, transportation and communications, agriculture, mining and commerce etc, which are normally within the province of the private sector, politicians and/or senior government officials often have a vested interest or direct involvement in the design and distribution of these activities. The latter includes decisions regarding sub-contracting and award of tenders on projects relating to these activities from which they obtain “commissions”. It also includes indirect benefits such as opportunities to employ one’s relatives in the government-run companies.

The engagement of government in these activities tends to have a crowding-out effect on private investment and supplants rather than complements private activities. This is not to say that government’s involvement in these activities is always a bad thing from the point of view of growth. In some cases, government’s involvement in these activities is a matter of necessity, triggered by market failure and the lack of private initiatives to take up these activities. However given the uncompetitive nature of government operations, the production of these goods and services by the government is often found wanting. The hypothesis put forward in the present analysis, therefore, is that the *ECSGDP* and *ECONTE* variables will have a negative effect on economic growth.
The use of the *DEBT* variable as one of the corruption indicators is predicated on the premise that countries that have high levels of public debt are often those whose governments are unstable and corrupt. The Mobuto regime in the former Zaire is a good illustration of this point. Under his regime, Mobuto systematically plundered Zaire of its rich mineral assets to finance his palatial consumption and, in the process, accumulated public debt to finance the operations of government. The term Mobuto Equivalence was thus coined to describe this state of affairs, highlighting the close linkages between the level of indebtedness and corruption. While public debt is not a major issue for the smaller island nations of the Pacific, it is certainly an issue for the bigger island nations such as Papua New Guinea and Fiji. It is important to note, however, that the point is not that debt is bad for growth but it is how that debt is applied that is the main issue. As long as the uses to which public borrowings are put are poorly managed and motivated by corrupt elements, it could not be expected that they would make a significant contribution to economic growth.

Finally, the *CAPCV* variable represents the variability of public investment or capital expenditure as measured by its coefficient of variation. The argument is that the variability of public investment denotes the discretionary manner in which politicians or senior government officials make decisions on the nation’s capital budget or public investment program. The greater the variability of public investment the greater are the chances that politicians are indulging in *ad hoc* allocation of public investment to suit their personal agendas. It implies lack of direction including an informed expenditure plan based on an integrated developmental framework. Under these circumstances the allocation of public investment is not based strictly on economic criteria, and thus the quality and productivity of public investment programs are adversely affected. The prediction of the model, therefore, is that the *CAPCV* variable is negatively correlated with economic growth.
All in all, the propositions advanced under the *outcome* approach are that corrupt governments tend to have high levels of government consumption expenditure, subsidy, and public debt and experience a high degree of public investment variability and government intervention in private sector activities. To the extent that these corrupt variables are highly correlated with each other, implying that they contain approximately the same amount of information, it may be best to combine them to form a composite index for corruption. This is done using the *principal component analysis* methodology, as demonstrated below.

**Which Option to Use?**

The choice between *determinant* and *outcome* approaches is a function of the assumptions made about the genesis of corruption and the particular context in which corruption is viewed. If, for instance, there are strong grounds to link particular events directly to corruption, then it may be best to employ the *outcome* approach. On the other hand, if such direct links are lacking or blurred, then the *determinant* approach may be more appropriate. This ambivalence, however, may disappear in the event that the variables under the two approaches are highly correlated to each other, in which case it does not matter which approach to use, except to the extent that the necessary data are available. Because of data constraints, the approach adopted in the study is based on the *outcome* approach only.

**Testing the Corrupt Origins of the Outcome variables**

Admittedly, the public finance variables listed under the *outcome* approach need not always be regarded as the outcome of corrupt or rent-seeking motives on the
part of the politicians or bureaucrats. They could be the results of well-meant policies by governments. However, as already explained, it is not unreasonable to relate these variables to either corrupt or rent-seeking behavior within the public sector, given their susceptibility to manipulation and appropriation by the policymakers. Support for this proposition may be obtained using factor analysis and/or by studying the levels of these public finance variables in countries in which corruption is believed to be prevalent. For instance, factor analysis could reveal the tendency of these variables to cluster around one common factor – whatever that common factor is, whether it be corruption or otherwise. On the other hand, the tendency for the levels of these variables to be high in countries where corruption is rampant could well underlie the important linkages between the level of corruption and the decisions giving rise to these variables.

The results of a factor analysis carried out on the variables based on data from the selected PICs for the period 1983-92 are provided in Table 7.1 below. It is an attempt to provide one piece of evidence in support of the hypothesis that these variables could be more appropriately categorized as a general indicator of corrupt or rent-seeking practices rather than as being economically motivated. The analysis is conducted with two factors identified.

Table 7.1: Factor Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECSGDP</td>
<td>0.906</td>
<td>0.298</td>
</tr>
<tr>
<td>GOVTC</td>
<td>0.796</td>
<td>0.246</td>
</tr>
<tr>
<td>CAPCV</td>
<td>0.687</td>
<td>0.307</td>
</tr>
<tr>
<td>ECONTE</td>
<td>0.531</td>
<td>0.487</td>
</tr>
<tr>
<td>DEBT</td>
<td>-0.729</td>
<td>-0.430</td>
</tr>
<tr>
<td>SUBGDP</td>
<td>-0.272</td>
<td>0.914</td>
</tr>
<tr>
<td>SUBTE</td>
<td>-0.445</td>
<td>0.839</td>
</tr>
</tbody>
</table>
As the table shows, the variables load most heavily on Factor 1. For instance, the absolute values of the Factor 1 loading of all of the corruption variables, with the exception of the SUBGDP and SUBTE variables, are more than twice their Factor 2 loadings. These are the results one would expect if these variables were predominantly tied to one common factor which, as argued in the present analysis, has been designated as the corruption or rent-seeking factor.\textsuperscript{37} In addition, the fact that all these variables are statistically significant and negatively related to economic growth, as outlined in Section 4 below, tends to reinforce the argument about the corrupt nature of the behaviour that gave rise to the size of these variables.

The second approach is to examine the levels of these variables in countries in which corruption is known to be rampant. For instance, it has been established that Fiji and Papua New Guinea are two of the countries in the South Pacific where corruption is quite prevalent (Kaunamauri 2000, and Chand 2001). A comparison of the values of the corruption variables for each of these two countries with the average values for the whole group may provide some preliminary indications of the extent to which these variables are correlated with corrupt and rent-seeking practices. For both these countries the mean values for \textit{GOVTC, ECONTE, SUBGDP, DEBT} and \textit{CAPCV} are in most cases above the group’s averages.\textsuperscript{38} Whether this phenomenon could actually reveal any important linkages between the levels of these variables and incidence of corruption remains an empirical question.

\textsuperscript{37} Note that factor analysis is a purely statistical technique indicating which, and to what degree, variables relate to the underlying and undefined factor. The substantive meaning of this factor is left to the researcher’s informed judgement.

\textsuperscript{38} To conserve space, these results are not shown but they can be obtained from the author.
Deriving the Composite Corruption Index

Having identified the key public finance variables (outcome variables) that constitute the study’s proposed corruption index, the next step is to show how this index is constructed using the principal component analysis (PCA) methodology. Applying the PCA approach, the composite corruption index \( CRRPT \) can be derived by finding the best linear combination of these outcome variables. As already explained, the best linear combination is the one that has the highest variance and that maximizes the prediction of the original outcome variable set. Since there are seven corruption variables in the set, the corruption index \( CRRPT \) is a linear function of the variables as follows:

\[
CRRPT = a_1 \text{ECGDP} + a_2 \text{GOVT} + a_3 \text{ECONTE} + a_4 \text{DEBT} + a_5 \text{SUBGDP} + a_6 \text{SUBTE}
\]

As already explained, the \( a \)'s are chosen so that the variance of the corruption index \( CRRPT \) is maximized, subject to the normalization condition being satisfied. \( CRRPT \) is the first principal component. It is the linear function of the right-hand-side variables that has the highest variance. This is the corruption index that is used in the empirical part of this study. The second principal component could also be derived and called \( CRRPT_2 \), but for the purpose of the present study the first principal component \( CRRPT \) suffices. Although it is not difficult to compute these principal components manually, the availability of specialized econometric packages has made this task relatively easy.

Before closing this section, it is important to recognize the potential criticism that both the determinant and outcome approaches may incur from drawing too much from rather simple and perhaps spurious correlations between the variables. The two approaches may be defended from this criticism as follows. First, such criticism is
equally applicable to the perception measures of corruption that have been used in the empirical studies referred to above. That is, the latter measures are also based on the "correlates" of corruption as perceived by the rating firms or the people being surveyed, which include most, if not all, of the variables considered under the two approaches. Second, since the variables used in the two approaches are only proxies for corruption, the results of the estimations based on these proxy variables reflect only suggestive, rather than definitive, evidence of the existence of corruption. In the absence of direct and observable measures of corruption, however, the use of proxy measures continues to play an important role in the study of the economic effects of corruption.

IV SUMMARY AND CONCLUDING REMARKS

Research on the role of institutions in economic growth and development has always been constrained by difficulties in finding appropriate and objective measures for the level and quality of institutions. While a plethora of qualitative measures/indicators has been developed by various risk-rating and multilateral organizations, the usefulness of these indices in empirical research has been found wanting. The two main criticisms of these indices from an empirical perspective are their fragmented nature and the fact that they cover only a limited number of countries. A search for an operational framework to develop aggregate or composite institutional measures based on hard data may provide solutions to the inherent shortcomings of these individual indicators. Firstly, aggregation can iron out the potential biases and multicollinearity problems due to the high degree of correlation
amongst these individual indicators. Secondly, aggregation can span a number of countries, thus enabling cross-country analyses and estimations. The indexation approaches discussed above are good candidates for efforts to construct composite institutional measures.

Because both the unobserved components and HS models rely heavily on the perception measures referred to above, which did not cover the PICs, their applicability for the analysis of the institution-growth relationships in the PICs is of limited value. In this context, the study develops its own institutional measure based on hard data, employing Principal Components Analysis methodology.\footnote{It would be of interest to see how both the unobserved components and the Hufter and Shah models perform if they were to be developed on the basis of the PCA framework.} Using the selected public finance variables assumed to be prone to corrupt and rent-seeking behavior, a composite corruption index was constructed. This corruption index is an important variable component of the regressions carried out in the main empirical part of the study (Chapter 8). Because corruption is only one, albeit an important, indicator of institutional quality, it is necessary for empirical purposes to apply this index in conjunction with the other indicators of institutional effectiveness, in particular the CIM index described in Section II, i.e., to support the notion that corruption and property rights security are the two most important indicators of institutional quality in the PICs. This is done in the next chapter.
CHAPTER 8

THE EMPIRICAL INVESTIGATION

Introduction

In the preceding chapters the focus was on the theoretical construct of the symbiosis between the quality of institutions and economic growth. In Chapter 6 a model was developed that captured the dynamics of the impact of corruption on the quality and productivity of public investment. Based on the predictions of this model, testable hypotheses were proposed that highlighted the adverse impacts of corruption and the possible channels through which corruption affects growth. As already explained (and further amplified below), the key proposition of this study is that corruption, poor property rights security, and constrained civil liberties, are the outcomes of institutional weaknesses. Thus, an attempt to test the effects of these variables on growth is essentially a test on the impact of institutional effectiveness.

The objective of the present chapter is to subject those hypotheses to empirical tests using data from the selected island economies of the South Pacific. This is a formidable task, given the difficulties in determining measures of institutional effectiveness that are appropriate for the PICs. The problem is compounded by the lack of generally accepted indicators or proxies for these institutional variables based on hard data that could be used for those countries not covered by the assessment of the risk-rating organizations already referred to. In light of these hindrances, the results reported in this chapter represent an important breakthrough in terms of providing concrete evidence of the significance of corruption and other institutional factors in the growth performances of these island economies.
The chapter is organized as follows. The next section, Section II, outlines the econometric and estimating models that are applied in the empirical analysis to estimate the magnitude of the impact of institutional factors, in particular corruption and security of property and contractual rights, on economic growth and development. As explained later, the analysis focuses almost exclusively on corruption and property (and contractual) rights, including civil liberty, as the main indicators of institutional quality. Section III provides an exposition of the nature and sources of the data collected on the variables used in the estimating equations and the problems associated with this data in terms of reliability and availability. Section IV constitutes the core part of the chapter, laying out and interpreting the results of the tests on the research questions or hypotheses outlined in section II. The final section, Section V, summarizes the key findings of the study.

II THE HYPOTHESES, ECONOMETRIC MODELS AND ESTIMATING METHODS

Hypotheses

In essence, the core idea of the study can be summarised by the following expression:

\[
Growth = Economic\ Activities \times \frac{1}{Corruption}
\]

This says that, other things being equal, the effects of economic activities on growth, whether it be in the form of increased public investment or exports, is larger the lower
the level of corruption, or the stronger are public institutions. From the standpoint of empirical analysis, the main difficulty is to operationalize the denominator on the right-hand side – the corruption variable. As explained below, while the focus is on corruption and its impact on the economic performances of the island countries of the South Pacific, an attempt is made to incorporate other institutional measures, notably property rights security and the presence of civil/political liberty, in the analysis. This is necessary since corruption is only one indicator of the level and quality of public institutions.

To fix ideas and assist in the development of an econometric framework underlying this empirical analysis, it is necessary to restate the research questions or hypotheses that this study seeks to address. The central hypothesis motivating the overall study is as follows:

- **Hypothesis 1**: The economic performance of the South Pacific countries is fundamentally determined by the level and quality of public institutions operating in these countries.

The critical empirical question relating to this main hypothesis is the issue of how to measure the level and quality of public institutions. As briefly outlined above, the study uses the level of corruption, property rights security and civil liberty as indicators of the effectiveness of public institutions. That is, the basic argument is that where public institutions are weak, corruption is likely to be prevalent, property rights security is poor, and civil liberty is constrained. This is not to say that all issues of governance and institutions boil down to these three variables/factors. Indeed, institutional quality encompasses a broad set of concerns including the rule of law, risks of expropriation, bureaucratic quality and effectiveness. The focus on these three
factors, in particular corruption, underlines their relative importance and pervasiveness in these island economies, as well as the lack of data on those other variables.

To deepen insights on the implications of the results from testing this hypothesis, it is necessary to extend the analysis and explore the different channels through which corruption affects economic growth. The two channels that the study identifies are public investment and the size of the public sector, as measured by the level of government expenditure on public administration. That is, it is argued that, because of their susceptibility to corrupt and rent-seeking practices, public investment in most of the Pacific islands is prone to corrupt practices, hindering its quality and productivity. Likewise, because of corrupt motives, the public sector in these countries tends to be over-sized either because of improper recruitment policies or because of the excessive intervention of government in what would otherwise be private sector activities. The following two subsidiary hypotheses therefore warrant investigation and testing in conjunction with the main hypothesis above.\(^4\)

- **Hypothesis 2:** Other things being equal, public investment is tied to the level of corruption. The corollary is that, because of the low productivity of public investment due to the presence of corruption, private investment tends to be negatively correlated with the level of public investment;

- **Hypothesis 3:** Other things being equal, the size of the public sector tends to be closely related to the level of corruption within the public sector.

\(^4\) These are not the only channels through which corruption affects growth but they are the two most relevant channels in the case of the Pacific island countries.
As explained below, the focus on public administration is a valid choice given the preponderance of the public sector in virtually all the Pacific island countries.

The Econometric Models

Because of the need to test these hypotheses separately, it is not appropriate to formulate one single econometric model that could capture all of them. Accordingly, separate econometric models, and the estimating equations, are formulated. The key econometric model, which applies to hypothesis 1, is as follows:

\[ GDPL_{it} = \alpha + \beta_1 I_{it} + \beta_2 M_{it} + \varepsilon_{it} \]  

where \( GDPL \) is the real growth rate of per capita GDP, \( I \) represents a set of standard conditioning variables as described in more detail in Section III below, and \( M \) represents a vector of variables of interest (i.e., the institutional variables – meaning the corruption, property rights and civil liberty variables). Specifically, for the purpose of the present analysis, the conditioning variables used include the population growth rate \( (POPG) \) to represent growth in the labor force, exports as a ratio of GDP \( (EXPO) \), and gross domestic investment \( (GDI) \) – all of which play an important part in the growth processes of the South Pacific economies. Although exports play a limited role in the growth performance of most of the Pacific countries (except for Fiji and Papua New Guinea), they have assumed an increasingly important role in the long-term economic development strategies of these economies - hence their inclusion in the equation (R.1). All variables are subscripted with \( i \) and \( t \), denoting the \( ith \)
cross-sectional unit (a country) and the \( nth \) observation, respectively, since the estimation is carried out using pooled data as already explained.

Hypothesis 2 seeks to capture the relationships between corruption and public investment to confirm the thesis that public investment is motivated more by corrupt and rent-seeking motives than by economic considerations (e.g., Tanzi and Davoodi, 1997). It also seeks to investigate the relationship between public investment and private investment to confirm the results of a study by Jayaraman (1996) on the same countries (except for PNG) which found a significant and negative relationship between these two variables. The relevant econometric model is as follows:

\[
GI_{it} = \alpha + \beta_1 POPG_{it} + \beta_2 PI_{it} + \beta_3 EXPO_{it} + \beta_4 CRRPT_{it} + \varepsilon_{it} \tag{R.2}
\]

where \( GI \) represents public investment as a ratio of current GDP, \( POPG \) is the rate of population growth, \( PI \) is private investment’s share in current GDP, \( EXPO \) is the share of total exports in GDP, and \( CRRPT \) is the composite corruption index, derived using the principal component analysis methodology. For the sake of consistency, this specification closely follows the format of equation R.1 above in terms of the right-hand-side variables. The \( POPG \) variable is included on the premise that the population growth rate has a direct influence on the level of public investment that the government would undertake, such as the number of hospitals, schools and roads to be built. Private investment \( (PI) \) is expected to have a negative relationship with public investment. That is, the higher the level of private investment, the lesser the role that the government would play in the economy, and hence the lower the level of public investment. Finally, exports are included as these could also influence the level of public investment, especially given the export-led growth strategies of most of the
South Pacific countries. As long as public investment is conducive to export-led development, it is expected that the export variable (*EXPO*) will be positively related to the level of public investment. The main focus in estimating this equation is on the relationship between the corruption variable (*CRRPT*) and public investment (*GI*) which is expected to be positive given the possible corrupt decision-making processes connected with the design and allocation of public investment.

As a further test of the relationship between corruption and public investment, the following alternative econometric model is proposed:

\[
CRRPT_{it} = \alpha + \beta_1 GI_{it} + \beta_2 GDPL_{it} + \beta_3 OPEN_{it} + \beta_4 FREE_{it} + \epsilon_{it} \quad (R.3)
\]

The major difference here is that corruption is now the dependent variable with public investment, per capita real GDP growth rate (*GDPL*) and the openness (*OPEN*) and the civil liberty (*FREE*) indices as the controlling variables. *GDPL* is included as this has been found to be a robust determinant, albeit negatively, of corruption (Treisman, 2000). The same justification holds for the openness index, *OPEN*, following a study by Wei (2000). Wei finds that the level of corruption is negatively related to the country’s degree of openness to international trade. The argument is that openness has the potential to limit arbitrary and discretionary decisions by officials connected with the granting of import/export licenses or tariff concessions, and hence minimizes the chances for corrupt or rent-seeking practices. Thus, the more open is an economy, the less prevalent are the regulatory measures governing international trade, and hence the less are the chances for the bureaucrats to exercise discretion in the application of those rules and regulations. The *FREE* variable is included on the ground that corruption tends to be rampant in countries
where civic and political liberty are suppressed, since this prevents disclosure and publicity of corrupt practices and hence provides little deterrence to the commission of corrupt acts.

As for the test of the relationship between private investment \((PI)\) and public investment, together with the level of corruption, the following specification is adopted:

\[
PI_t = \alpha + \beta_1 \text{POPG}_t + \beta_2 \text{GDPL}_t + \beta_3 \text{GI}_t + \beta_4 \text{CIM}_t + \beta_5 \text{CRRPT}_t + \epsilon_t \quad (R.4)
\]

This specification differs slightly from the specification adopted by Jayaraman (1996) in that the \(\text{POPG}, \text{CIM}\) and \(\text{CRRPT}\) variables are included as additional explanatory variables. The \(\text{POPG}\) variable is included since, among other factors, demographic characteristics of a country play quite an important part in the decisions of private investors. For instance, where the population growth rate is high, excess labor supply has the potential to drive down wage rates and hence makes it attractive for private investment. This condition only holds if the age structure of the population is of young and working age, which is a common characteristic of the population make-up of the Pacific islands. An indicator for property rights security \((\text{CIM})\) is included as one of the key explanatory variables to highlight the importance of this factor to private investment decisions (Clague et al, 1999). Both the \(\text{CIM}\) and \(\text{CRRPT}\) variables are included to underline the fact that, although property (and contractual) rights security and corruption are both indicators of the quality of public institutions, they are quite distinct in terms of their impact on private investment and hence economic growth.\(^4\)

\(^4\) Based on the data collected, there are no multicollinearity problems between these variables.
With respect to hypothesis 3, the test focuses on the extent to which corruption influences the size of the public service as measured by the total expenditure on public administration. The focus on public administration may be justified on the grounds that in most of the South Pacific countries, the public sector plays a dominant role, accounting for between 60 percent and 80 percent of GDP as in Kiribati and the Cook Islands, respectively. The intriguing question that will be investigated here is whether this phenomenon is related to corrupt or rent-seeking objectives on the part of politicians or government officials. The econometric specification for this hypothesis is as follows:

\[
\text{PUBADMIN}_\mu = \alpha + \beta_1 \text{POPG}_\mu + \beta_2 \text{PI}_\mu + \beta_3 \text{CIM}_\mu + \beta_4 \text{CRRPT}_\mu + \varepsilon_\mu \quad (R.5)
\]

where \( \text{PUBADMIN} \) is the share of total expenditure on public administration in current GDP, and all the other explanatory variables are as explained already. The primary focus of the test is on the validity of the proposition that the size of the public service in most of the developing countries, including the South Pacific countries under review, is positively associated with the level of corruption in the public sector. The \( \text{POPG} \) variable is included because of its direct effect on the size of the public service and hence the cost of public administration. That is, with the government being the major employer and supplier of goods and services in the Pacific Islands, the size of the population is likely to have a direct, positive relationship with the size of the public sector. Private investment (\( \text{PI} \)) is included on the assumption that the higher the level of private investment in the economy, the lesser is the role that the government plays and, hence the smaller is the size of the public sector. The \( \text{CIM} \) variable is included to highlight the importance of strong and effective public
institutions in determining the overall size of the public sector. That is, with strong public institutions, there will be proper checks and balances in place to prevent arbitrary policies, especially in relation to recruitment of personnel into the public service, thereby preventing a costly and over-sized public service. Thus, it is expected that $CIM$ be negatively correlated with $PUBADMIN$.

The Estimating Methods

Because of the lack of data on most of the South Pacific countries, as explained in Section III below, estimation of the above econometric models is severely constrained by the limited number of observations. This renders impractical the derivation of an efficient and consistent estimation of the relationships implied in the models. As a remedy for this data deficiency problem, the analysis resorts to some form of data pooling technique that is capable of dealing effectively with the inevitably complex structure of pooled data, and that could also ensure efficient and consistent estimates of the parameters. The estimating method applied in this analysis is that developed by Parks (1967) and which has been further elaborated by Kmenta (1986) (hereafter called the PK pooling method). Jarayaman (1996) uses this pooling method in his empirical work relating to the South Pacific countries. The chief advantage of pooling is that it could provide more efficient estimation, inference, and possibly prediction, provided the model is properly specified (Vinod and Ullah, 1981).

Because of its rather involved nature, a brief explanation of the PK pooling method is warranted. The PK pooling technique is essentially a special case of the

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42 For a detailed discussion of the advantages and disadvantages of pooling data, refer to Koutsoyiannis (1977).
generalized least square (GLS) estimating method which is well covered in most econometric text books. However, pooling data exposes the analyst to two major statistical problems. That is, since in this case time series and cross-sectional data are combined, the data is likely to be contaminated by both heteroscedasticity and autocorrelation problems. The objective of the PK pooling technique then is to find a way of estimating the parameters of a model that will take care of both these major problems and therefore yield efficient results.

The PK pooling method proceeds as follows. Suppose there are \( N \) cross-sectional units observed over \( T \) time periods to give a total of \( NT \) observations. The regression equation can be written as follows:

\[
Y_{it} = X_{it} \beta + \varepsilon_{it} \quad \text{For } i = 1, \ldots, N \quad t = 1, \ldots, T
\]

where \( \beta \) is a \( K \times 1 \) vector of unknown parameters and \( \varepsilon_{it} \) is a random error. In applying the PK estimation technique, there are two approaches to consider in relation to the behavior of the disturbance term \( \varepsilon_{it} \). One approach is to combine the usual assumptions about cross-sectional observations with those that are usually made when dealing with time series. For example, as for the cross-sectional observations, observations on individual countries at a point (or period) of time, it is frequently assumed that the regression disturbances are mutually independent but heteroskedastic. As for the time series, one usually suspects that the disturbances are autoregressive though not necessarily heteroskedastic. When dealing with pooled cross-section and time-series observations, these two assumptions may be combined.

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43 For instance, refer to Chapter 12 of Kmenta (1986).
and a *cross-sectionally heteroskedastic and time-wise autoregressive* (CHTA) model adopted. The assumptions of this specific model are as follows:

\[
E(\varepsilon_i^2) = \sigma_i^2 \quad \text{heteroskedasticity}
\]

\[
E(\varepsilon_i \varepsilon_j) = \sigma_i^2 \quad \text{For } i \neq j, \text{ cross-section independence}
\]

\[
\varepsilon_u = \rho_i \varepsilon_{i,t-1} + \nu_u \quad \text{autoregression}
\]

And \( E(\nu_u) = 0, \ E(\nu_u^2) = \phi_u, \ E(\nu_u \nu_j) = 0 \) for \( i \neq j, \ E(\nu_u \nu_{js}) = 0 \) for \( t \neq s \), and \( E(\varepsilon_{i,t-1} \varepsilon_j) = 0 \).

The second approach is to assume that the cross-sectional units are mutually dependent. The most questionable assumption of the preceding model is that the cross-sectional units are mutually independent. In most cases, especially when the cross-sectional units are geographical regions wherein the constituent countries have very close economic and political ties (as is the case of the South Pacific countries), this assumption is highly unrealistic. It would be more appropriate in this case, therefore, to generalize the preceding model by dropping the assumption of mutual independence and arriving at what is termed a *cross-sectionally correlated and time-wise autoregressive model*. Under this model specification, the assumptions of the CHTA model above can be extended to allow for cross-section correlation so that \( E(\varepsilon_u \varepsilon_j) = \sigma_{ij}, \ E(\nu_u \nu_{js}) = 0 \) for \( t \neq s \). An estimate of \( \beta \) is then obtained by a generalized least squares (GLS) procedure. Because of its relevance to the circumstances of the subject countries of this study, the latter model is applied in the empirical part of this chapter.
In a nutshell, the estimation proceeds by subjecting the observations to a double transformation – one transformation is designed to remove the autoregression and the other to remove heteroskedasticity – and then apply the ordinary least squares method on the transformed data. This procedure is necessary since the behavior of the disturbances (error term) over the cross-sectional unit is likely to be different from the behavior of the disturbances of a given cross-sectional unit over time. The resultant estimator is the GLS estimator which has, under fairly general conditions, the desirable properties of consistency, asymptotic efficiency, and asymptotic normality. (Refer to the *Shazam User Manual Version 8* for a detailed outline of the steps involved in estimating from pooled data).

**Indices and Variables Construction**

The methods for the construction of composite indices for the focal variables namely, corruption, property rights security and civil liberty, which are used in the study as indicators of institutional quality, are described in detail in Chapter 7. In a nutshell, the composite corruption index was constructed using the Principal Component Analysis methodology. The constituent variables of this corruption index include the following public finance variables: the ratio of government consumption to GDP (*GOVTC*), the ratio of subsidy to GDP (*SUBGDP*) (and also the ratio of expenditure on subsidies to total government expenditure (*SUBTE*)), the ratio of government GDP to private GDP (*ECSGDP*) (and also the ratio of government expenditure on economic services to GDP (*ECOLTE*)), the ratio of external debt to GDP (*DEBT*), and the variability of public capital expenditure as measured by its coefficient of variation (*CAPCV*).
The measures for property rights security and civil liberty were based on the contract-intensive-money (CIM) approach and ratings from Freedom House, respectively.

III THE DATA

Data Constraints

The major constraint facing the present research is the availability and reliability of data relating to the South Pacific islands selected for the purpose of this study, namely, Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu. Of these seven Pacific islands, only Fiji, and to some extent Papua New Guinea, have a long enough time series that could allow useful empirical analysis. The other countries are mostly devoid of such long and uninterrupted economic data series.

Given the paucity of data, the only effective way of obtaining reliable statistical estimation is to pool the data (cross-section/time series) for the countries for a given period in order to boost sample size. Because pooled cross-section time series analysis requires balanced data for the countries selected, a choice has to be made on the years in which the countries have the most complete data on the variables specified in the models outlined in section 2. For this reason, the present analysis is confined to the 10-year period 1983-92, since it is the most complete period, at least for the majority of the countries. This means that altogether the total number of observations is 70. The missing observations on some variables for a few of the
countries (Kiribati, Samoa and Solomon Islands) have to be estimated using accepted estimation techniques such as the zero-order regression method as in Maddala (1977).

Data Sources and their Nature

The bulk of the data was obtained from the World Bank, IMF, United Nations and the ADB published and online sources. For some of the countries, such as Kiribati, whose data cannot be accessed online or through the records available, data for these countries had to be collected in-country.

Apart from the population growth rate ($POPG$) and the $FREE$ variable, all explanatory variables are expressed as ratios of current GDP. Real GDP is derived by converting current GDP into US dollar equivalents first and then using the 1995 prices for the purpose of expressing current GDP in constant terms. The 1995 prices, obtained from World Outlook 2000, are used because this is the only CPI for which data is available for all countries. It is important to note that measurement of national income in these island economies of the South Pacific is likely to involve error, in particular because the subsistence economy is quite a dominant sector in most of these countries and this sector’s contribution to consumption is poorly measured.

With the exception of the corruption index ($CRRPT$), $CAPCV$ and $FREE$ variables, all the variables are in logarithmic form. This is necessary as one possible means of mitigating the distorting effects of outlier influences and possible measurement error problems. As already mentioned, the $CAPCV$ variable is derived by calculating the coefficient of variation of capital expenditure using a 3-year interval. The data for the $FREE$ variable was obtained from Freedom House. To avoid ambiguity in interpretation, the original score values which range from 1 (most free) to 7 (least free) were re-scaled so that the grading was from high to low, i.e., 7 stands
for most free and 1 for the least free. As already mentioned, the corruption index (CRRPT) was derived using the PCA methodology.

IV THE EMPIRICAL RESULTS

This section reports on the results of the estimations conducted on the regression equations outlined in section 2 above. The analysis proceeds first with the basic model (Equation R.1) which contains the study's key hypothesis relating corruption and other institutional factors to economic growth in the context of the seven countries of the South Pacific. Then, it proceeds to testing the subsidiary hypotheses in equations R.2 and R.3. Note that all estimations are carried out on the basis of pooled cross-section, time series data.

In estimating equation R.1, the analysis proceeds in two stages. First, it uses OLS to estimate the model. Then, it estimates the regression equation using the PK pooling method. The estimations are carried out in both levels and logarithmic values as part of the tests on the robustness of the results. Also, to gain further insight on how the individual variables comprising the corruption index correlate with the dependent variable (growth rate of real GDP per capita), these variables are regressed individually as well as aggregatively. As a means of testing the robustness of the estimated coefficient of the corruption index, different combinations of the constituent variables are tried, including the one derived via the PCA method. The latter is the preferred corruption index (CRRPT).
To conserve space, the results from the OLS estimate are not reported here, and only those from the PK pooling estimate are reported as summarized in Tables 8.1 and 8.2 below, and Tables 8.2.1 and 8.3.1 in Appendix 3. Table 8.1 below reports the results of the regressions in level forms, based on the constructed corruption indices.

### TABLE 8.1: POOLED REGRESSIONS (IN LEVELS) – CORRUPTION INDICES

(Independent Variable: Per Capita Real GDP Growth Rate in Percentage)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONST</td>
<td>-14.390** (-2.663)</td>
<td>-14.516*** (-2.740)</td>
<td>-15.764*** (-3.05)</td>
<td>-14.966*** (-2.910)</td>
<td>-11.811*** (-2.915)</td>
</tr>
<tr>
<td>POPG</td>
<td>1.160 (1.291)</td>
<td>0.972 (1.100)</td>
<td>0.397 (0.470)</td>
<td>0.378 (0.424)</td>
<td>2.237** (2.486)</td>
</tr>
<tr>
<td>GDI</td>
<td>0.045 (0.461)</td>
<td>0.019 (0.195)</td>
<td>0.084 (0.828)</td>
<td>0.067 (0.673)</td>
<td>-0.0554 (0.783)</td>
</tr>
<tr>
<td>EXPO</td>
<td>0.226** (2.355)</td>
<td>0.238** (2.533)</td>
<td>0.235** (2.639)</td>
<td>0.227** (2.513)</td>
<td>0.104 (1.418)</td>
</tr>
<tr>
<td>CRRPT1</td>
<td>-0.3E-04 *** (-5.948)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRRPT2</td>
<td></td>
<td>-0.12E-04*** (-5.469)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRRPT3</td>
<td></td>
<td></td>
<td>-0.56E-06*** (-5.684)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRRPT4</td>
<td></td>
<td></td>
<td></td>
<td>-0.23E-06*** (-5.030)</td>
<td></td>
</tr>
<tr>
<td>CRRPT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-23.395*** (-6.927)</td>
</tr>
<tr>
<td>R-SQUARED</td>
<td>0.403</td>
<td>0.332</td>
<td>0.385</td>
<td>0.315</td>
<td>0.441</td>
</tr>
<tr>
<td>F-Statistics</td>
<td>10.988***</td>
<td>8.095***</td>
<td>10.155***</td>
<td>7.486***</td>
<td>12.606***</td>
</tr>
<tr>
<td>SER</td>
<td>0.723</td>
<td>0.723</td>
<td>0.728</td>
<td>0.727</td>
<td>0.719</td>
</tr>
</tbody>
</table>

The t-statistics are in parenthesis. (***) , (**) , and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

As can be seen, the constructed corruption indices, which are derived from different combinations of the presumed corruption variables discussed in Section II and in the Data Appendix, are all of the expected sign and significant at all levels of the test. Note that the CRRPT variable is the corruption composite index derived via the PCA methodology. (Refer to Appendix 2 for the derivation of the other corruption indices – CRRPT1, CRRPT2, CRRPT3, and CRRPT4).45

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44 These results are available from the author. As expected, the estimated results from the OLS regressions are mostly statistically insignificant due largely to the likely presence of both the autocorrelation and heteroskedasticity problems inherent in such cross-sectional time series data.

45 The objective of applying these different combinations of the variables is to test the robustness and efficacy of those variables as indicators of corruption. As can be seen from the tables, the same result
Table 8.2.1 of Appendix 3 reports on the result of the regressions in level forms also, but focusing on the individual components that make up the corruption indices. It can be seen from that table that most of the presumed corruption variables (i.e., ECGDP, GOVTC, SUBGDP, etc) carry the expected negative signs and are statistically significant at the 1 percent significance level. Another interesting result is the estimated coefficients on the other institutional variables, in particular the CIM variable which yields the expected positive sign and is highly significant. This result is consistent with the finding of Clague et al (1999). However, the estimated parameters for the OPEN variable as an indicator of good policy, and the FREE variable as further evidence of the quality of public institutions, are both statistically insignificant under this model specification.

As one of the means used to test the robustness of the results reported in Tables 8.1 and 8.2.1 (Appendix 3), the regressions were re-run using the logarithmic values of the variables, i.e., using the logarithmic form of equation R.1. These results are reported in Table 8.2 below.

Again, the corruption indices are all statistically significant at all levels of the test and are of the expected signs. Interpreted literally, the point estimate of the CRRPT variable implies that, ceteris paribus, an increase in the level of corruption of one standard deviation will result in an expected decrease in the per capita GDP growth rate of 0.339 of its standard deviation (0.101), which is approximately 3 percentage points.

holds regardless of what index (permutation) is used in the analysis. This tends to confirm the proposition that these public finance variables are prone to corrupt and/or rent-seeking manipulations.
### Table 8.2: Pooled Regression (using log values): Corruption Indices

(Dependent Variable: Per Capita Real GDP Growth Rate)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONST</td>
<td>0.082</td>
<td>0.068</td>
<td>0.0745</td>
<td>0.061</td>
<td>0.0075</td>
</tr>
<tr>
<td></td>
<td>(1.610)</td>
<td>(1.319)</td>
<td>(1.392)</td>
<td>(1.165)</td>
<td>(0.1775)</td>
</tr>
<tr>
<td>POPG</td>
<td>-0.019***</td>
<td>-0.018***</td>
<td>-0.0179***</td>
<td>-0.0186***</td>
<td>-0.018***</td>
</tr>
<tr>
<td></td>
<td>(-3.792)</td>
<td>(-3.305)</td>
<td>(-3.081)</td>
<td>(-3.122)</td>
<td>(-3.994)</td>
</tr>
<tr>
<td>GDI</td>
<td>0.049**</td>
<td>-0.0384</td>
<td>0.0515**</td>
<td>0.0462**</td>
<td>0.0247</td>
</tr>
<tr>
<td></td>
<td>(2.058)</td>
<td>(1.582)</td>
<td>(2.024)</td>
<td>(1.853)</td>
<td>(1.190)</td>
</tr>
<tr>
<td>EXPO</td>
<td>0.120***</td>
<td>0.124***</td>
<td>0.114***</td>
<td>0.111***</td>
<td>0.102***</td>
</tr>
<tr>
<td></td>
<td>(3.922)</td>
<td>(3.924)</td>
<td>(3.711)</td>
<td>(3.540)</td>
<td>(4.064)</td>
</tr>
<tr>
<td>CRRPT1</td>
<td>-0.27E-06***</td>
<td>-0.11E-06***</td>
<td>-0.11E-06***</td>
<td>-0.23E-08***</td>
<td>-0.195***</td>
</tr>
<tr>
<td></td>
<td>(-6.324)</td>
<td>(-5.362)</td>
<td>(-6.115)</td>
<td>(-5.073)</td>
<td>(-5.844)</td>
</tr>
<tr>
<td>CRRPT2</td>
<td>0.120***</td>
<td>0.124***</td>
<td>0.114***</td>
<td>0.111***</td>
<td>0.102***</td>
</tr>
<tr>
<td></td>
<td>(3.922)</td>
<td>(3.924)</td>
<td>(3.711)</td>
<td>(3.540)</td>
<td>(4.064)</td>
</tr>
<tr>
<td>CRRPT3</td>
<td>-0.56E-08***</td>
<td>-0.56E-08***</td>
<td>-0.23E-08***</td>
<td>-0.195***</td>
<td>-0.551</td>
</tr>
<tr>
<td></td>
<td>(-6.115)</td>
<td>(-6.115)</td>
<td>(-5.073)</td>
<td>(-5.844)</td>
<td>(-5.844)</td>
</tr>
<tr>
<td>CRRPT4</td>
<td>-0.27E-06***</td>
<td>-0.11E-06***</td>
<td>-0.11E-06***</td>
<td>-0.23E-08***</td>
<td>-0.195***</td>
</tr>
<tr>
<td></td>
<td>(-6.324)</td>
<td>(-5.362)</td>
<td>(-6.115)</td>
<td>(-5.073)</td>
<td>(-5.844)</td>
</tr>
<tr>
<td>R-SQUARED</td>
<td>0.606</td>
<td>0.564</td>
<td>0.576</td>
<td>0.524</td>
<td>0.551</td>
</tr>
<tr>
<td>F-Statistics</td>
<td>17.584***</td>
<td>14.16E***</td>
<td>14.579***</td>
<td>11.675***</td>
<td>15.977***</td>
</tr>
<tr>
<td>SER</td>
<td>0.727</td>
<td>0.726</td>
<td>0.731</td>
<td>0.729</td>
<td>0.726</td>
</tr>
</tbody>
</table>

The t-statistics are in parenthesis. (* * *), (**), and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

The results of the regressions based on the logarithmic values of the individual components of the corruption index are reported in Table 8.3.1 of Appendix 3. Again, the corruption variables are mostly significant at the 1 percent level of the test and carry the expected negative signs.

Focusing on the key institutional variables – CRRPT, CIM, and FREE - the results reported above suggest that in countries where the level of corruption is high, economic growth rates are lower vis-à-vis those countries that keep the level of corruption under control. This is consistent with the findings of earlier studies (e.g., Mauro 1995, and Poirson 1998).

With respect to the CIM variable, the estimated parameter remains intact, reflecting its resilience to changes in functional form. This result implies that those countries in the South Pacific with a government system that underpins the protection of property rights and enforceability of contracts tend to grow faster than those that do not. Interpreting the point estimate on the CIM variable literally, an increase in the level of property and contractual rights securities of one of its standard deviation will lead to an expected increase in growth rate of 0.318 of its standard deviation, i.e., an
increase of approximately 3 percentage points. This compares reasonably well with
the 2 percentage points reported by Clague et al (1999). (It compares also with the
results on the same variable reported below).

Before moving on to other tests, it is important to point out a rather unusual
result concerning the coefficient of the population growth rate \((POPG)\) in all the
regressions. As can be seen, all regressions carry a negative, albeit significant,
coefficient of this variable, contradicting the neoclassical theory which postulates a
positive relationship between the rate of economic growth and the growth rate of the
labor force. As explained in section 2, due to the lack of data on labor force for most
if not all of the countries, the annual mean of the population growth rate is used in lieu
of the growth rate in the labor force. To the extent that the burgeoning population
growth rate has been proved to be one of the major bottlenecks to the long-term
economic growth of the developing countries (the PICs included), the negative
coefficient of the \(POPG\) variable reported here should not be a surprise.

**Alternative Specification**

The foregoing analysis uses the standard conditioning variables in the
regression equations to estimate the magnitude of the impact of the corruption and
other institutional variables on the dependent variable – the per capita real GDP
growth rate, \(GDPL\). Since the prime objective of this study is to investigate
empirically the role of institutions (as proxied by corruption, property rights security
and the presence of political/civil freedom) in the growth processes of these island
economies, it may be more appropriate to consider an alternative specification of the
basic model that is more closely aligned with this objective. In this connection, the
following alternative specification is proposed:
where the variables are as already described. This is a parsimonious specification focusing specifically on the relationship between the institutional variables and the economic growth rate, where the institutional variables are represented by the CIM, FREE and CRRPT variables. This parsimonious equation, which is the preferred model of analysis for the remainder of this chapter, has the advantage of simplicity and of being institutionally-oriented and focusing on the primary, fundamental determinants of economic growth (Hall and Jones 1999). An argument for leaving out the standard controlling variables of capital and labor is that, given the right policies and institutions, a country can get all the capital and labor that it needs.

In testing this alternative model, the analysis proceeds by considering first the very basic version of this model, regressing the per capita GDP growth rate on each of the corruption indexes, before estimating the complete model which includes the other institutional variables: the CIM and FREE variables. The estimation results on this alternative model are summarized in Table 8.3 below.\textsuperscript{46}

\begin{equation}
GDPL_{it} = \beta_0 + \beta_1 CIM_{it} + \beta_2 FREE_{it} + \beta_4 CRRPT_{it} + \epsilon_{it} \tag{R.6}
\end{equation}

\textsuperscript{46} Although the POPG variable is included in the Alternative model, the results are not affected after re-running the regressions without this variable.
Table 8.3: POOLED REGRESSIONS (IN LOGS) – THE GROWTH EQUATION – ALTERNATIVE SPECIFICATION
(Dependent variable is Log of real GDP per capita growth rate)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Hausman Test@</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONST</td>
<td>-0.011</td>
<td>-0.0123</td>
<td>-0.018</td>
<td>-0.017</td>
<td>-0.04**</td>
<td>-0.086***</td>
<td>-0.085***</td>
<td>-0.08***</td>
<td>-0.08***</td>
<td>-0.06**</td>
</tr>
<tr>
<td></td>
<td>(-0.942)</td>
<td>(-1.150)</td>
<td>(-1.574)</td>
<td>(-1.589)</td>
<td>(-2.689)</td>
<td>(-3.506)</td>
<td>(-3.503)</td>
<td>(-3.305)</td>
<td>(-3.315)</td>
<td>(-2.620)</td>
</tr>
<tr>
<td>POPG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.017***</td>
<td>-0.017***</td>
<td>-0.02***</td>
<td>-0.02***</td>
<td>-0.01***</td>
<td>-0.012***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-3.596)</td>
<td>(-3.561)</td>
<td>(-3.568)</td>
<td>(-3.727)</td>
<td>(-3.01)</td>
<td>(-3.324)</td>
</tr>
<tr>
<td>CIM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.116**</td>
<td>0.134***</td>
<td>0.13***</td>
<td>0.15***</td>
<td>0.22***</td>
<td>0.23***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2.845)</td>
<td>(3.659)</td>
<td>(3.670)</td>
<td>(4.119)</td>
<td>(7.873)</td>
<td>(7.534)</td>
</tr>
<tr>
<td>FREE</td>
<td>0.0145**</td>
<td>0.017**</td>
<td>0.013**</td>
<td>0.014**</td>
<td>0.02***</td>
<td>0.03***</td>
<td>0.044**</td>
<td>0.02***</td>
<td>0.03***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.481)</td>
<td>(2.276)</td>
<td>(2.403)</td>
<td>(2.379)</td>
<td>(3.122)</td>
<td>(3.342)</td>
<td>(3.122)</td>
<td>(3.342)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRRPT1</td>
<td>-0.21E-06**</td>
<td>-0.13E-07</td>
<td></td>
<td>-0.01**</td>
<td>-0.50E-07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-7.098)</td>
<td>(-2.453)**</td>
<td></td>
<td>(-3.46)</td>
<td>(-2.346)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRRPT2</td>
<td></td>
<td>-0.85E-07</td>
<td></td>
<td></td>
<td>-0.50E-07</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td>(-5.674)</td>
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<td>(-2.346)**</td>
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</tr>
<tr>
<td>CRRPT3</td>
<td></td>
<td></td>
<td></td>
<td>-0.19E-08</td>
<td>-0.27E-08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-7.035)**</td>
<td>(-3.253)</td>
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<td></td>
</tr>
<tr>
<td>CRRPT4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.21E-08</td>
<td>-0.99E-09</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-5.551)</td>
<td>(-3.538)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>CRRPT</td>
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<td>-10***</td>
<td>-0.12***</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-3.025)</td>
<td>(-4.39)</td>
<td>(-3.799)</td>
<td></td>
<td></td>
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<tr>
<td>RESCPT</td>
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<td></td>
<td></td>
<td></td>
<td>0.00429</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>(0.455)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>R-SQD</td>
<td>0.458</td>
<td>0.360</td>
<td>0.479</td>
<td>0.368</td>
<td>0.135</td>
<td>0.658</td>
<td>0.653</td>
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<td>0.653</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.663)</td>
</tr>
<tr>
<td>F-Stat</td>
<td>50.4**</td>
<td>32.2***</td>
<td>49.495***</td>
<td>30.8***</td>
<td>22.032***</td>
<td>22.317***</td>
<td>21.8***</td>
<td>20.1***</td>
<td>21.7**</td>
<td>17.6***</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>SER</td>
<td>0.901</td>
<td>0.896</td>
<td>0.903</td>
<td>0.899</td>
<td>0.898</td>
<td>0.721</td>
<td>0.718</td>
<td>0.718</td>
<td>0.713</td>
<td>0.720</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.633</td>
</tr>
</tbody>
</table>

@The instruments used to carry out the Hausman test include all the right-hand side variables (exogenous) in the model plus the Open variable following Wei (2000). RESCPT is the residual obtained after regressing the corrupt index (CRRPT), as derived using the Principal Component Analysis methodology, on these instruments. The t-statistics are in parenthesis. (***) , (**) , and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

As can be seen from the regression models 1 to 5 in this table, the coefficients on the corruption variables have the expected negative signs and are highly significant. In the context of regression 5 which uses the corruption index derived via the PCA methodology, corruption explains about 14 percentage points of the per capita GDP variation in growth rates. The estimation of the complete model (regressions 6 to 10) also yields good results. The estimated coefficients on all the corruption indices still carry the expected signs and are highly significant. Likewise, the coefficients on the other institutional variables – the CIM and FREE variables – carry the expected signs (positive) and are highly significant. In the context of 47 The exclusion of the population growth rate variable (POPG) from regression 10 did not affect the significance and signs of the estimated parameters for the institutional variables (CIM, FREE, and CRRPT).

47 The exclusion of the population growth rate variable (POPG) from regression 10 did not affect the significance and signs of the estimated parameters for the institutional variables (CIM, FREE, and CRRPT).
regression 10 (the preferred model), the model explains about 65 percentage of the total variation in per capita GDP growth rates. All the variables are significant at the 1 percent significance level of the test, implying the highly significant role that institutional factors play in the economic performance of these island countries.48

Taking the point estimates literally, a one standard deviation increase in the level of security over property and contractual rights produces an increase in income growth rates of 0.363 of its standard deviation (0.101), i.e., an increase of approximately 3 percentage points, holding the other variables constant. Likewise, holding the other variables constant, a one standard deviation increase in the amount of freedom that the citizens enjoy is expected to cause an increase in economic growth rate of 0.211 of its standard deviation, which is approximately 2 percentage points. Finally, other things being equal, an increase of one standard deviation of the level of corruption produces a reduction in the per capita GDP growth rate of 0.212 of its standard deviation, which is approximately 2 percentage points.

Note that the results obtained under the alternative specification above are not very different from those obtained under the standard model (Equation R.1). They are not also very different from the results of the earlier works on the same subject (e.g., Mauro 1994, Tanzi and Davoodi, 1997, and Clague et al 1999). Save for the reliability of the data used in this empirical work, these results provide, for the first time, empirical evidence of the important role that institutional factors play in the growth processes of these Pacific island economies. The most important feature of these results is the robustness of the estimated parameters of these institutional variables with respect to both data transformation and the change in the specification of the estimated model. This underscores the finding of the basic model (Equation

48 The exclusion of CAPCV as one of the constituent elements of the corruption index (CRRPT) did not materially affect the signs and significance of the estimated parameters for CRRPT and the other institutional the variables (C/M and FREE).
R.1) discussed earlier relating to the important role that institutions play in the growth performances of these island economies.

The remaining issue to be addressed before leaving this section is the question of endogeneity or simultaneity bias with respect to the corruption variable under this alternative specification. That is, it is highly likely that the level of corruption may be influenced to a great degree by the level of income such that it can no longer be regarded as a truly exogenous variable in the model. If this is the case, then the estimated coefficient on the corruption index \( (CRRPT) \) could be biased and inconsistent. To check, therefore, for this possible simultaneity problem, the Hausman test is carried out on the corruption variable using appropriate instruments. The instruments used are all the right-hand side variables in the alternative model in R6 above, which are assumed to be exogenous, but also including the openness variable \( (Open) \) as this has been found to be instrumental to the incidence of corruption (Wei 2000). The result of this test is set out in column 11 of Table 8.3. As can be seen, the residual variable \( (RESCPT) \), which is obtained by regressing the corruption index on these instruments, is not significantly different from zero at the 1 percent test level. This means that the null hypothesis of simultaneity is rejected, implying a lack of association between the level of corruption and income. (Note, however, that in terms of the F-statistics, the null hypothesis cannot be rejected at all levels of the test).

As a further check on this reverse causality question, both the original model (equation R.1) and the alternative model (equation R.5) were re-run using lead values for the dependent variable, \( GDPL \). The regressions could have been re-run using lagged values of the explanatory variables but this proves difficult due to lack of data on the earlier and later years on most of the key variables. The results of this further test are summarized in Tables 8.4 and 8.5 below.
Table 8.4: POOLED REGRESSIONS (IN LOGS) – USING LEAD REAL GDP PER CAPITA GROWTH RATES – THE ORIGINAL MODEL

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONST</td>
<td>-0.0381 (-0.919)</td>
<td>-0.0167 (-0.385)</td>
<td>-0.0861* (-1.938)</td>
</tr>
<tr>
<td>POPG</td>
<td>-0.013** (-2.474)</td>
<td>-0.013** (-2.392)</td>
<td>-0.013** (-2.299)</td>
</tr>
<tr>
<td>GDI</td>
<td>-0.028 (-1.452)</td>
<td>-0.0067 (-0.555)</td>
<td>-0.0084 (-0.434)</td>
</tr>
<tr>
<td>EXPO</td>
<td>0.056** (2.007)</td>
<td>0.0455* (1.883)</td>
<td>0.0145 (0.533)</td>
</tr>
<tr>
<td>CIM</td>
<td>0.14*** (5.087)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREE</td>
<td></td>
<td>-0.019*** (-3.901)</td>
<td>-0.06*** (-3.255)</td>
</tr>
<tr>
<td>CRPT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-SQD</td>
<td>0.358</td>
<td>0.289</td>
<td>0.250</td>
</tr>
<tr>
<td>F-STAT</td>
<td>9.06***</td>
<td>6.44***</td>
<td>5.41***</td>
</tr>
<tr>
<td>SER</td>
<td>0.696</td>
<td>0.697</td>
<td>0.709</td>
</tr>
<tr>
<td>N</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The t-statistics are in parenthesis. (***) , (**) , and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table 8.5: APPLYING LEAD VALUES FOR REAL GDP (THE DEPENDENT VARIABLE) ON THE ALTERNATIVE MODEL

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONST</td>
<td>-0.0696 (-1.438)</td>
<td>-0.0423* (-1.851)</td>
<td>-0.0344*** (-2.748)</td>
<td>-0.0008 (-0.058)</td>
</tr>
<tr>
<td>POPG</td>
<td>-0.0116** (-2.028)</td>
<td>-0.011** (-2.501)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDI</td>
<td>-0.0189 (-0.967)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPO</td>
<td>0.0093 (0.255)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPEN</td>
<td>0.0626 (1.291)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIM</td>
<td>0.120*** (3.855)</td>
<td>0.107*** (3.520)</td>
<td></td>
<td>0.121*** (4.834)</td>
</tr>
<tr>
<td>FREE</td>
<td></td>
<td>-0.00136 (-0.268)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRPT</td>
<td>-0.046*** (-2.688)</td>
<td>-0.0652*** (-3.883)</td>
<td>-0.0690*** (-4.622)</td>
<td>-0.0735*** (-6.815)</td>
</tr>
<tr>
<td>R-SQD</td>
<td>0.472</td>
<td>0.601</td>
<td>0.241</td>
<td>0.642</td>
</tr>
<tr>
<td>SER</td>
<td>0.562</td>
<td>0.716</td>
<td>0.893</td>
<td>0.844</td>
</tr>
<tr>
<td>N</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The t-statistics are in parenthesis. (***) , (**) , and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Again, the results on the key variables stand firm, confirming the result of the test above regarding the irrelevance of the reverse causality problem as a major issue,

49 It is assumed here that CIM and FREE are both exogenous variables.
at least in the context of the present data. As can be seen from Table 8.4, the corruption variable (CRRPT) is still of the expected sign and is highly significant. The standardized coefficient of this variable implies that a one-standard deviation increase in the level of corruption is expected to cause a decrease in the income growth rate by 0.122 of the latter’s standard deviation (0.101), which is approximately 1 percentage point. About the same marginal effect of corruption on growth is noticed in the alternative model as in regression 2 of Table 8.5.

As for the property rights variable (CIM), the standardized coefficient suggests that a one-standard deviation increase in the security of property rights produces an increase in income growth rate of 0.181 of its standard deviation, which is approximately 2 percentage points.

Concerns that may be raised about the above results are that they may be driven disproportionately by the few “outlier” countries in the group, or that the data used for the analysis are of dubious value and that the results produced are therefore suspect. In order to address both these concerns, the estimating models were re-run (using again lead values for the dependent variable) excluding countries that could be considered “outliers” in terms of their effects on the data for the group. For this purpose, Fiji and Kiribati are singled out – Fiji, because of its dominant role in the economy of the South Pacific region (apart from PNG) plus the fact that it is a country with the most unstable political environment; and Kiribati because it is a country with the least developed statistical bureau and hence with the most unreliable data. The results on this test are summarized in Table 8.6 below. Note that, for Fiji, regressions 1, 2, and 3 represent the standard model (R.1), the extended version of R.1, and the

50 The only exception is the FREE variable which is still statistically significant but of the wrong, negative sign.
alternative model (R.6), respectively. Regressions 4, 5, and 6 for Kiribati are the counterparts of regressions 1, 2, and 3.

Table 8.6: POOLED REGRESSIONS (IN LOGS) – EXCLUDING FIJI AND KIRIBATI

<table>
<thead>
<tr>
<th></th>
<th>FIJI EXCLUDED</th>
<th>KIRIBATI EXCLUDED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>CONST</td>
<td>-0.0804</td>
<td>-0.0737**</td>
</tr>
<tr>
<td></td>
<td>(-1.379)</td>
<td>(-2.425)</td>
</tr>
<tr>
<td>POPG</td>
<td>-0.015**</td>
<td>-0.0123**</td>
</tr>
<tr>
<td></td>
<td>(-2.175)</td>
<td>(-2.375)</td>
</tr>
<tr>
<td>GDI</td>
<td>0.00149</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0481)</td>
<td></td>
</tr>
<tr>
<td>EXPO</td>
<td>0.0035</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIM</td>
<td>0.157***</td>
<td>0.0133</td>
</tr>
<tr>
<td></td>
<td>(4.602)</td>
<td>(1.819)</td>
</tr>
<tr>
<td>FREE</td>
<td>0.0133</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.819)</td>
<td></td>
</tr>
<tr>
<td>CRRPT</td>
<td>-0.0518**</td>
<td>-0.102***</td>
</tr>
<tr>
<td></td>
<td>(-2.349)</td>
<td>(-4.650)</td>
</tr>
<tr>
<td>R-SQD</td>
<td>0.209</td>
<td>0.618</td>
</tr>
<tr>
<td>F-Statistics</td>
<td>3.341***</td>
<td>18.90***</td>
</tr>
<tr>
<td>SER</td>
<td>0.696</td>
<td>0.721</td>
</tr>
</tbody>
</table>

The t-statistics are in parenthesis. (***) , (**) , and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively. The dependent variable is Lead Real GDP per capita growth rate.

The results are interesting. With Fiji excluded from the Base Model (Regression 1), both the gross domestic investment (GDI) and the export (EXPO) variables lack statistical significance and hence explanatory powers on the dependent variable GDPL. However, the significance and magnitude of the corruption variable (CRRPT) remain intact. The same is true for the Alternative Model (Regression 2). That is, the corruption variable (CRRPT) and the property rights variable (CIM) still carry the expected signs and both are highly significant. However, the FREE variable is now significant at the 10 percent significance level only.

With Kiribati excluded from the dataset, the results are mixed. Under the Base Model (Regression 3), the results are qualitatively similar to those for Fiji, especially in relation to the corruption index (CRRPT). However, under the Alternative Model (Regression 4), none of the explanatory variables, including the institutional variables, are significant, although they still carry the expected signs.
All in all, the results of the test are mixed, depending on which regression model is used. When the Base Model is used, there are no “outlier” effects under either scenario (i.e., when either Fiji or Kiribati is excluded). However, this is not the case when the Alternative Model is used, with Kiribati being the suspect country. Given this ambivalent situation, it is not conclusive that Kiribati is an outlier in the dataset. It is advisable, therefore, that one interprets these results with caution.  

The Subsidiary Hypotheses

In this subsection, public corruption is further investigated by examining two of the main channels through which the effects of such corruption operate. These two channels are summed up in hypotheses 2 and 3. Hypothesis 2 stipulates that public investment in the small developing countries, including the South Pacific countries covered in the present study, is motivated more by corrupt and rent-seeking motives than by genuine social and economic concerns. As such, the quality and productivity of these capital projects are likely to be diminished and greatly distorted. This hypothesis is counter to the findings of Ashauer (1989) and others which support the proposition that public investment could, on average, be productive to growth.

Table 8.7 below summarizes the results of the test on these subsidiary hypotheses.

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51 One way of overcoming this problem is to re-run the regressions using data from different time periods for the seven countries, but this is a luxury that the study lacks given the severe paucity of data for most of the PICs.
### Table 8.7: Pooled Regressions (In Logs) – The Private Investment (1), Public Investment (2), Corruption (3) and Public Administration (4) Regressions (Using Lead Real GDP Per Capita Growth Rate)

<table>
<thead>
<tr>
<th>DEPENDENT VARIABLES</th>
<th>1: PUBLIC INVESTMENT</th>
<th>2: PRIVATE INVESTMENT</th>
<th>3: CORRUPTION</th>
<th>4: PUBADMIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONST</td>
<td>-2.481*** (-12.31)</td>
<td>2.008*** (15.29)</td>
<td>0.0883*** (2.677)</td>
<td>-0.225*** (-14.45)</td>
</tr>
<tr>
<td>POPG</td>
<td>0.0325* (1.665)</td>
<td>0.5871*** (7.288)</td>
<td></td>
<td>0.186*** (28.99)</td>
</tr>
<tr>
<td>GDI</td>
<td>-0.108*** (-4.297)</td>
<td>0.0325* (1.665)</td>
<td></td>
<td>0.201*** (16.19)</td>
</tr>
<tr>
<td>PI</td>
<td>-0.108*** (-4.297)</td>
<td>-0.0457 (-1.298)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>-7.165*** (-32.53)</td>
<td>0.0557*** (4.090)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPO</td>
<td>-0.479*** (-2.747)</td>
<td>-0.170*** (-4.391)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDPL</td>
<td></td>
<td>-0.0457 (-1.298)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPEN</td>
<td></td>
<td>-0.170*** (-4.391)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIM</td>
<td>8.941*** (9.067)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREE</td>
<td></td>
<td>0.0031 (0.315)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFRA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRRPT</td>
<td>0.784*** (3.355)</td>
<td>-8.369*** (-15.45)</td>
<td>0.916*** (14.98)</td>
<td></td>
</tr>
<tr>
<td>R-SQD</td>
<td>0.916</td>
<td>0.99</td>
<td>0.384</td>
<td>0.999</td>
</tr>
<tr>
<td>F-Statistics</td>
<td>11.602***</td>
<td>5502.789***</td>
<td>10.133***</td>
<td>8027.832***</td>
</tr>
<tr>
<td>SER</td>
<td>0.718</td>
<td>0.6111</td>
<td>0.724</td>
<td>0.693</td>
</tr>
</tbody>
</table>

The t-statistics are in parenthesis. (***) , (**) , and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

As can be seen from regression 1 in the above table, the South Pacific data support the proposition that public investment is positively and significantly associated with the level of corruption and/or rent-seeking practices. The point estimate (standardized coefficient) suggests that a one-standard deviation increase in the level of corruption is expected to cause an increase of 0.254 of the standard deviation of public investment (0.644), which is approximately 16 percentage points. This is a rather large figure but not necessarily suspect given the preponderance of the government sector in the economies of these countries. This result may help explain why public investment in most of the countries in the South Pacific tends to have a neutral, if not negative, effect on growth. That is, the corrupt and rent-seeking elements tend to distort the composition and quality of public investment.

Another notable feature of regression 1 above is the relationship between public investment and private investment. As argued by Aschauer and others, not all
public investment is inimical to private investment and hence to economic growth. That is, while higher public investment can raise the national rate of capital accumulation above the optimal level and crowd out private investment, some forms of public capital – such as highways, communications, water systems, sewers and airports – are likely to bear a complementary relationship with private investment. In this latter case, higher public investment may raise the marginal productivity of private capital and, thereby, crowd-in private investment. Depending on their relative potency, the interaction of these two forces could result in either a decrease or increase in private investment and hence in the income growth rate. For the South Pacific countries, at least for the seven countries selected for this study, the data tends to support the former scenario. This result may probably reflect the fact that, in the aggregate, public investments in these Pacific countries during the period 19983/92 has been in low-return areas such as buildings and much may have been managed ineffectively and had low returns. The investments of public enterprises engaged in loss-making commercial activities have also contributed much to this outcome (The World Bank, 1995).

Regression 2 in Table 8.7 shows the result of the estimation carried out on the private investment equation (Equation 3). Note that, except for the dependent variable $PI$ and the corruption index $CRRPT$, all variables are in logarithmic form. The important feature of this result is the relationship between private investment and the focal variables – public investment ($GI$), contracts and property rights ($CIM$) and corruption ($CRRPT$). All the estimated coefficients of these variables are statistically significant at the 1 percent significance level and carry the expected signs. The highly significant and negative relationship between the level of private investment and public investment points to the lack of complementarity between these forms of investment but, more importantly, to the crowding-out effects of
public investment on private investment. The point estimate (non-standardized) implies that a 10 percent increase in the level of (unproductive) public investment is expected to reduce private investment by 0.72 percent. On the other hand, the point estimate (non-standardized) on the property rights variable suggests that a 10 percent increase in the level of property rights security is likely to increase private investment by 0.9 percent. Finally, the point estimate on the corruption variable suggests that a unit increase in the level of corruption is expected to cause a fall in the level of private investment by approximately 8 percent.

To further test the relationship between corruption and public investment, a corruption equation is estimated while controlling for the real growth rate $GDPL$, the openness of the economy $OPEN$, and the freedom of expression variable $FREE$. The results of this test are shown in regression 3 in Table 8.7 above. As can be seen, public investment is still positively and significantly related to the level of corruption. The $FREE$ variable appears to have a neutral effect on the level of corruption. The most interesting result coming out of this regression is the relationship between corruption and the openness of the economy, which is negative and highly significant at all levels of the test. This result is consistent with the findings of Wei (2000). Taken literally, the point estimate (standardized coefficient) implies that a one standard deviation increase in the degree of openness of a country lowers the level of corruption by 0.124 of its standard deviation (0.209), which is approximately 3 percentage points.

The final hypothesis to be tested is Hypothesis 3 which states that corruption tends to distort the allocation of government expenditure, with a tendency to allocate more resources to those areas over which government officials and politicians have direct control. Because of data constraints, the test on this hypothesis is focused on the relationship between the level of corruption and the size of the
public administration (civil service). This emphasis on the relationship between public administration, as a dependent variable, and corruption is well justified given the preponderance of the public sector in these island economies, as already explained in Section II. This particular feature of these island economies has been the subject of continuing criticisms by the aid donors including the World Bank and the IMF. The interesting question that may be raised in relation to this issue is whether corruption or rent-seeking practices play a major part in this allocation. The proposition advanced in this study is that corruption plays a major part in the design and allocation of resources to this sector, and hence is considered as one of the key factors accounting for the bloated cost of public administration in these economies.

Regression 4 in Table 8.7 summarizes the results of the estimation of the public administration regression. As can be seen, there is a very strong and positive relationship between the size of public administration and the level of corruption. Taken literally, the point estimate on the corruption variable suggests that a one standard deviation increase in the level of corruption is likely to lead to an increase in the size of the public service of 0.268 of its standard deviation (0.244), which is approximately 6 percentage points. This is a rather large figure, but if it is realistic it would go to show how much corrupt or rent-seeking practices contribute to the poor performance of these countries. Also, it would underpin the earlier hypothesis about the unrelenting grip of the government on those activities that could be more effectively handled by the private sector. The privatization or corporatization of those activities that could be more effectively carried out by the private sector, such as transportation, manufacturing, and public works, could greatly reduce the size of and hence expenditure on public administration. This could in turn effectively reduce the scope for corruption by public officials and politicians. But the results also show
that without effective property and contractual rights, there would not be much benefit from trying to privatize what are now public enterprises.

V SUMMARY AND CONCLUDING REMARKS

The foregoing analysis attempts to investigate empirically the extent to which the quality of public institutions affects the level of economic performance, as measured by per capita real GDP growth rate, in the context of the South Pacific island economies. The key indicators used as a measure of the quality of public institutions are corruption, property rights, and political freedom or freedom of expression. While it would be desirable to include other hard-data based measures of institutional quality such as revenue arrears, level of expenditure on regulations, the differentials in the wage rates between the public and private sectors, or expenditure on infrastructural maintenance, the lack of data on these variables has made this impossible.

The greatest challenge facing the present analysis was the task of developing a measure for corruption in the context of the South Pacific countries. This is because none of the countries in the South Pacific are included in the worldwide survey-based rankings carried out by the various risk-rating international organizations relating to corruption and other institutional indicators. Therefore, the study developed its own measure for corruption based on hard data and using an outcome-based approach. It identifies those public finance variables that are most likely to be the outcome of corrupt and/or rent-seeking policies on the part of politicians and bureaucrats, and uses these variables to construct a composite index for corruption.
The public finance variables selected for this purpose are government consumption expenditure, the level of government intervention in the private sector economy, the level of subsidy provided to corporations and companies, public debt, and the variability of capital expenditure as measured by its coefficient of variation. The strong presumption of the study is that: a corrupt government is one that: (a) spends more on unproductive activities as characterized by the ratio of government consumption expenditure to GDP; (b) suppresses private sector activities or the operation of efficient market forces; (c) has a tendency to transfer public resources towards unproductive ends; (d) has a greater degree of discretionary powers in the design and allocation of public investment; and (e) carries high levels of public debt.

The measure for the security of property and contractual rights that the study uses is the one developed by Clague et al (1999), based also on hard data, which is the contract intensive money (CIM) ratio. Finally, as a measure for political freedom or freedom of expression, the study uses scores derived by Freedom House as re-scaled to avoid ambiguity of interpretation.

The data for the seven Pacific island countries lends significant support to the proposition that the quality of public institutions plays a crucial role in the growth performances of these countries. This is evident not only in the high statistical significance of the estimated parameters for the above institutional variables but also in their resilience and robustness to data transformation and changes in model specifications. The most important findings of the study based on the data for the 10-year period 1983-1992, can be summarized as follows:

- Corruption has a deleterious effect on the per capita real GDP growth performance of these economies, with the potential to reduce the growth rate
by approximately between 2 and 3 percentage points for a one standard deviation increase in corruption.

- On the other hand, protection of property and contractual rights and freedom of expression contributes positively to income growth performance. Their contributions are estimated to be around 3 and 2 percentage points, respectively, for a one standard deviation improvement in these variables.

- Corruption also adversely affects the level of private investment, reducing it by 8 percentage points. On the other hand, security of property and contractual rights boosts private investment by approximately 0.72 percentage.

- Public investment in these countries tends to be highly associated with the level of corruption. It is estimated that a one-standard deviation increase in the level of corruption is expected to increase public investment by 16 percentage points.

- Private investment is inversely related to the level of public investment, due to the unproductive nature of the latter, although the magnitude of this relationship is not very significant.

- Finally, there appears to be a close association between the level of corruption and the size of the public sector. It is estimated that a one standard deviation increase in the level of corruption is likely to cause an increase in the size of the public sector by 6 percentage points.

It must be emphasized, however, that these results provide only preliminary and suggestive evidence of the role of corruption and other institutional factors in the growth processes of the South Pacific island economies. Definitive conclusions about the validity of these results depend to a great extent on the efficacy of the
corruption measures employed by the study and how those public finance variables chosen as indicators for corruption actually relate to corruption within the public sector. Also, the nature and reliability of the data, together with the estimating method used in the analysis, must be taken into account when drawing inferences from these results. Notwithstanding these possible shortcomings, one thing is beyond doubt: corruption and other institutional weaknesses do play a major part in the overall economic performance of these island economies. This conclusion poses a major challenge to the authorities of these countries, calling for the need to identify appropriate reform measures that they should undertake in order to strengthen their institutions and thereby reduce the level of corruption and its corrosive effects on their economic performance.

52 These results were based on the 10-year period 1983-92. The fact that the PICs still performed poorly in the subsequent years (1993-99), with an average real GDP growth rate of 1.8 percent per annum, may suggest that the institutional environment operating in these countries was still inadequate.
CHAPTER 9

POLICY IMPLICATIONS

Introduction

The empirical analysis carried out in the preceding chapter on the seven Pacific Island countries (PICs) yields very interesting results concerning the relationship between the quality of institutions and economic growth. Using the measures of the level of corruption, property rights security and civil liberty as indicators of the effectiveness of institutions, the results of the tests underscore the proposition that the quality of institutions is positively related to economic growth. More precisely, the results show that, in the context of the PICs, a one-standard deviation increase in the level of corruption has the potential to reduce the GDP growth rate of these countries by 2 to 3 percentage points per annum on a permanent basis. They also show that protection of property and contractual rights and civil liberty contributes positively to income growth performance - their contributions, in the case of the PICs, are estimated at 3 and 2 percentage points, respectively, for a one-standard deviation improvement in these variables. These results are consistent with the findings of the earlier researches on the subject (e.g., Mauro 1995, Clague et al. 1999), and underpin the policy stance of the World Bank and the major donor agencies in relation to the growth strategies that the PICs should pursue.

In light of the continued dismal economic performance of the PICs, the biggest challenge confronting the governments of these island nations is the task of putting in place the conditions necessary for the development of workable and effective institutions that would support a broad-based and sustained economic
growth. Unless the PICs can push through the necessary reforms, they risk becoming trapped in a vicious circle in which pervasive corruption and an insecure property rights regime undermine public trust and incentives, weaken the credibility of the state, and retard economic growth.

It is the objective of this chapter, therefore, to consider and evaluate the policy measures that the PICs need to take in order to improve and strengthen the level and quality of institutions, and hence their growth performance. This is a difficult task as it presupposes the ability to identify, and hence target, those components of institutions that are crucial to development and economic growth. The approach adopted in this chapter is to focus on the three indicators of the effectiveness of institutions referred to above. That is, to strengthen the effectiveness of institutions is tantamount to adopting policies aimed at eradicating corruption, enhancing the protection of property and contractual rights, and promoting civil liberty. Because civil liberty is not a major problem in most of the PICs, the emphasis is on policy measures targeted at controlling corruption and ensuring a secure property rights regime.53

The structure of the chapter is as follows. The next section, Section II, proposes an anti-corruption program that the PICs should consider adopting in their fight against corruption. This program includes the establishment of a ‘national integrity system’ (NIS), and the promotion of an atmosphere conducive to the development of a corrupt-free society. Section III considers the policy measures necessary for the establishment of a strong property rights regime. This discussion covers land issues and the effectiveness of the regulatory framework operating in these countries. Section IV evaluates the policy measures proposed in sections II and

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53 According to the latest ratings of Freedom House on civil liberty, the PICs obtain, on average, a score of 2 – implying that the citizenry of these countries enjoy a high level of civil and political freedom.
III, and makes recommendations on the policy actions that the PICs should take, considering the unique problems and the constraints that these countries face. Finally, Section V contains a summary and concluding remarks.

II DESIGNING AN EFFECTIVE ANTI-CORRUPTION PROGRAM

In designing an effective anti-corruption program and the strategies necessary for its successful implementation, there are two points that need to be stressed. First, there is no universally applicable model or strategy for combating corruption. The multifaceted nature of the causes of corruption and the fact that its pattern and outcomes vary across countries renders difficult the development of a uniform anti-corruption strategy that can be applied in all contexts. This is particularly true in the case of the PICs where there is a great diversity in the pattern and level of corruption and the extent to which it is embedded within the system. However, as discussed below, although the typology of corruption differs across countries, there are a number of cross-cutting principles essential in operationalizing an effective anti-corruption strategy that are universally applicable.

Second, corruption is a multipronged phenomenon requiring a multipronged approach in order to combat it. To be effective, therefore, efforts to control corruption must move beyond a narrow response to its immediate manifestations to a broader and holistic approach of addressing its underlying causes. The approach for combating corruption in the public sector has traditionally focused on reforming public administration and the management of public finances. However, with increasing recognition that the root causes of corruption extend far beyond
weaknesses in the capacity of government, the repertoire has been gradually expanding to target broader structural relationships among core institutions, the interaction between the state and firms, and the relationship between the state and civil society.

A schematic representation of the multipronged approach to combating corruption referred to above may help put things in perspective. This is provided in Figure 9.1 below.54

Figure 9.1: A Multipronged Strategy: Addressing Corruption

Most of the anti-corruption programs that have been carried out in the recent past failed because of their over-emphasis on a uniform approach that does not take into account important differences in the pattern and underlying causes of corruption,
and their failures to adopt a holistic approach to tackling corruption. It is important, therefore, that recognition is made of these differences with a view to providing a stronger foundation for devising more appropriate and finely tuned anti-corruption strategies in different contexts.

Though the methods of addressing corruption may differ across countries, the goals are the same: enhancing state capacity and public sector management, strengthening political accountability, enabling civil society, and increasing economic competition. These goals determine the specific policy actions to be implemented in the context of the country’s comprehensive anti-corruption program.

Establishing a National Integrity System (NIS)

The ‘National Integrity System’ (NIS) represents an example of the comprehensive and multipronged approach to fighting corruption referred to above. It comprises six main pillars – public sector reform, strengthening institutional restraints, coalition building and strengthening civil society participation, promoting a free and independent media, creating a competitive private sector, and international cooperation – which are interdependent and mutually reinforcing. The establishment of a NIS is predicated on the premise that corruption is a systemic problem, and thus the primary emphasis should be on changing the systems rather than blaming the individuals. The ultimate goal is to make corruption a “high risk” and “low return” undertaking. As such, NIS purports to prevent corruption from occurring in the first place.

54 Adapted from the World Bank’s report on combating corruption in Transition economies (World Bank 2000a).
55 Discussion of Political Accountability (as in Fig 9.1) is included under Institutional Restraint and Public Sector Reform.
What follows is an overview of the various components/building blocks of a NIS, focusing on their potential contributions towards policies designed to eradicate or at least reduce the level of corruption. Discussion of the applicability of the NIS in the context of the PICs is the subject of Section IV below.

Public Sector Reforms

A comprehensive reform of the public sector is one of the most crucial building blocks of NIS. It helps countries effect changes that will make corrupt behavior more difficult to engage in and more readily detected once it occurs. The key elements of a comprehensive public sector reform program includes: instilling meritocracy and adequate pay in public administration; the establishment of ethical codes of behavior in the public sector; clarifying governance structures; enhancing predictability, transparency and accountability in fiscal management; improved procurement procedures; and policy and program rationalization.

The first step in reforming public sector management is to eliminate patronage by instituting meritocratic systems for appointment, promotion, and performance evaluation and, where feasible, establishing an independent civil service oversight body. In parallel, it is important to review the incentive and salary structures, relate them to skill and responsibility, and regularize the extensive non-salary benefits that provide broad scope for discretion and corruption. The inadequacy of public sector salaries has been shown to contribute greatly to corrupt activities in the public service (van Rijckeghem and Weder 1997). Ensuring a living wage is, therefore, crucial to public sector efficiency and effectiveness, and to containing the incentives for corruption in the public sector.\(^{56}\)

\(^{56}\) Singapore has been conspicuously successful in this endeavor.
The “monetization of benefits” is another incentive mechanism through which civil servants are allowed to decide whether they wish to receive their benefits or have them replaced with their monetary equivalent. This may enhance the value civil servants attach to their posts, reduce temptations to accept bribes, and leads to higher standards of service delivery.

The second important element of a comprehensive public sector reform program is the establishment of ethical codes of behavior in the public sector. Fighting corruption requires a clear ethical commitment by political leaders and senior public officials. The codes of conducts set out the ethos which should guide those in managerial/leadership positions, reminding them of their responsibilities to the public. The success of this “ethical codes” approach depends critically on the acceptability of such codes to the public sector, effective enforcement, and political commitment, as well as the support of civil society.

The third element is the need to review governance and functional structures within the public service. In particular, regulatory and economic functions should be separated.

The promotion of predictability, transparency, and accountability in public administration and fiscal management is the fourth element of comprehensive public sector reform. The emphasis should be on ensuring that the fundamental building blocks for transparent, predictable and accountable public administration are in place. These building blocks include: an appropriate legal framework and effective enforcement mechanisms; a professional, competent, motivated, and meritocratic civil service; effective internal control systems; and a well-functioning independent audit office.

57 A complementary requirement to the establishment of ethical codes is the need for those in positions of influence to make an official declaration of their income and assets on a periodic basis.
The procurement of supplies by the public service is one of the areas that is highly susceptible to corrupt and rent-seeking practices, and hence its control constitutes one of the essential pillars of public sector reform. Public service procurement procedures can be improved in the following ways:

- Procurement should be economical, i.e., it should result in the best quality of goods/services for the price paid, or the lowest price for the stipulated quality of goods and services.
- Contract award decisions should be fair and impartial.
- The process should be transparent, i.e., procurement requirements, rules and decision-making criteria should be readily accessible to all potential suppliers/contractors, preferably announced as part of the invitation to bid; opening bids should be public, and all decisions should be fully recorded.
- Accountability is essential, i.e., procedures should be systematic and dependable, and records should be maintained that could explain and justify all decisions and actions.

The final element of public sector reform is policy and program rationalization. This encompasses the discontinuation of rules and regulations that serve no useful public purpose; redesignation of each program’s purpose to make it simpler and easier to monitor; and privatization of state-run enterprises and services. Related to this reform is the decentralization of service delivery, which can make the state more responsive to the needs of the people and improve service delivery. However, in countries where the accountability and capacity of sub-national governments is weak and there are few safeguards against manipulation of municipal assets and enterprises for the private gain of local officials, decentralization can
actually increase corruption, bias resource allocation, and adversely affect access to and the quality of basic social services.

*Strengthening Institutional Restraints*

The second pillar of NIS relates to the strengthening of institutional restraints. The institutional design of the state can be an important mechanism in checking corruption. The three most important institutions that can provide effective restraints on corrupt and rent-seeking practices are the judiciary, supreme audit offices, and the office of the ombudsman. The last two institutions are also known as “watchdog” agencies.

An effective judiciary is often the most important restraint, as the existence of genuine legal recourse underpins the credibility of other institutions of the state and allows these institutions to be credibly challenged when needed. The effectiveness of the judiciary depends critically on the fulfillment of the following core conditions: independence, the power to enforce the rulings, and efficient organization.

Independence from the executive arm of government is the most important of these conditions. Whatever the precise character of the judicial relations with the legislature and executive, all countries rely on the judiciary to hold the executive accountable under the law and to interpret and enforce the terms of the constitutions. It should be noted however that while judicial independence is important, it must not be allowed to come at the expense of accountability. In this context, efforts must be made to undertake reforms aimed at raising judicial accountability. These include: setting and monitoring judicial performance standards and ethical behavior, introducing greater transparency in relations between judges and litigants, publishing trial records and judicial decisions, and introducing transparent methods of case assignment.
The effectiveness of the judiciary also depends on its decisions being enforced. In practice, this means that other branches of the government must consent to provide the resources needed for enforcement, including personnel authorized by law to serve court documents, to seize and dispose of property, and to turn the proceeds over to the winning party.

The third component of judicial effectiveness is organizational efficiency, which is needed to avoid long delays in clearing cases. This requires that the judiciary be adequately endowed with both the financial and personnel resources. Also, it may require the adoption of rules and laws that are procedurally efficient, i.e., rules that are simpler to administer and apply and therefore are likely to reduce the cost or increase the accuracy of using the legal system (Posner, 1998 – see Box 9.1). Although this internal efficiency requirement of the judiciary is less critical than its independence and enforcement authority, a state beginning from weak institutional base should consider building this aspect of judicial performance its first priority.

**BOX 9.1: THE POSNER MODEL**

The essence of the Posner model is the adoption of simple rules (and laws) that the judiciary administers and implements. This approach has two advantages. The first is that the application of simple rules places fewer demands on the time and the competence of the judges and is, therefore, both cheaper and more likely to be accurate. Second, simple rules facilitate monitoring of judges and so reduce the likelihood of bribery and the influence of politics in the judicial process. The less discretion a judge has in making decisions, the easier it will be to determine whether a case has been decided contrary to law or whether there is a pattern of favoring one class or group of litigants over another. The trade-off therefore is between making a modest investment in better rules and making a big investment in the judiciary. The latter involves having judicial salaries that are high enough and tenure of office that are sufficiently secure in order to attract competent and honest lawyers. Where it is more costly to create a high-quality independent judiciary, there would be more benefits to focus legal reform on the adoption of substantively and procedurally efficient rules. This is not to say that the task of improving the legal
system should be completely abandoned. Indeed, if the legal infrastructure is completely weak, even good rules may simply be ignored.

Adapted from Posner (1998)

Audit organizations also play a crucial role in strengthening institutional restraints. They act as a watchdog over the financial integrity of the state in the management of public resources, and ensure the credibility of reported information. For full effectiveness, state audit offices should be independent and guaranteed the rights under the constitution to carry out their investigations without restrictions or hindrances. These rights should be backed by parliamentary committees that review and follow up on their reports.

The ombudsman is an office that independently receives and investigates allegations of maladministration in the civil service. In most of the developing countries, maladministration in the way of nepotism in recruitment and/or promotion and abuse of public offices is a common form of corruption. The Ombudsman office, therefore, provides a very useful role in overseeing and restraining such arbitrary behaviors and practices within the civil service.

It must be emphasized that the effectiveness of these three institutions depends critically on the prior establishment of a core of strong, independent, and credible professionals in the judicial, prosecutorial, and police arms of the state. Also, it requires that these institutions are provided with adequate budgetary resources and expertise to support their operations. The inadequacy of these resources has often placed severe limits on the ability of these institutions to deliver their services effectively, efficiently and honestly.
Coalition Building and Strengthening Civil Society Participation

Anti-corruption campaigns cannot succeed without public support. Building coalitions between civil society and government is, therefore, an important step in fighting corruption, and constitutes a critical pillar of NIS.\textsuperscript{58} As stakeholders in the quality of governance and institutions mediating between the state and the public, the organizations that comprise “civil society” – citizens groups, NGOs, trade unions, business associations, think tanks, and religious organizations – can have an important role in constraining corruption. Civil society organizations’ ability to monitor, detect and reverse the activities of public officials is enhanced by their proximity and familiarity with local issues. Thus, if the reform process is to prove credible and sustainable, civil stakeholders need to be involved from the outset.

An important element of this coalition approach is the raising of public awareness. Some countries have engendered public understanding through public awareness programs focused on: the harm done by corruption; the fact that the corrupt are stealing the public’s money; the public’s rights to quality services; and the public duty to complain when officials behave corruptly. Social marketing – the design, implementation, and control of programs intended to influence the acceptability of social ideas - is one of the effective methods of promoting public awareness and attitudinal change.\textsuperscript{59}

Promoting a Free and Independent Media

Informed appraisal of government by the public is a difficult task if government activities are obscured from public scrutiny. A critical element of the

\textsuperscript{58} Coalition building is the process of involving different stakeholders from government and civil society to design institutional reforms.

\textsuperscript{59} Social marketing is fairly new and although there have been some interesting stories, it is far more difficult to get people to alter their behavior than to get consumers to change their favorite brand of soap or toothpaste (Kindra and Stapenhurst 1998).
country's anti-corruption program (NIS), therefore, is an effective media. A free and open media can help check the level of corruption by uncovering and shedding light on abuses. The media has a dual role to play in the fight against corruption: it not only raises public awareness about corruption, its causes, consequences and possible remedies but also investigates and reports incidences of corruption.

A prerequisite for building an effective media is a legal system that is independent of political influence and has firm constitutional support for a free press. In most countries, particularly the PICs, the government itself is the largest media owner and operator, which can undermine the independence of the media. Government monopolies on printing, supply of paper distribution, and television signal transmission continue in many countries, creating pressure for self-censorship. Where these happen, efforts should be undertaken to strengthen the independence of the media, possibly through the privatization of state-controlled media.

Creating a Competitive Private Sector

Promoting a vibrant and competitive private sector should be an integral part of a public sector reform program and of NIS. Experience has shown that where the state is a major player in the economy, it has the tendency to pursue policies through production activities and neglect the development of its regulatory functions that can support the evolutions of market institutions. Government involvement in business activity has been through joint ventures with domestic or overseas investors, or indirectly through the provision of tariffs and subsidies. Because of the ready exercise of administrative discretion in the allocation of resources, corrupt and rent-seeking activities are likely to flourish in these state-dominated economies.

Developing a competitive private sector, therefore, could provide an effective mechanism for reducing the scope for corruption in the public sector. This calls for
the privatization of state-owned enterprises and the adoption of policy measures that ensure competition in the private sector. Such policy measures include the lifting of restrictions on market entry and capital controls, access to bank and equity finance, and streamlining procedures for the issue of licences and permits for business operations.

While privatization may help to lower the level of corruption, it could also be a source of corrupt activities. Reports abound about the privatization process being fraught with embezzlement, theft and bribery (e.g., ADB 1998, World Bank 2000a). To avoid this problem, it is critical that transparent, unbiased, and fully contestable procedures be utilized in the sale of state assets. When the sale involves a natural monopoly such as a utility company, it is important that capable, independent regulatory agencies be established to provide adequate oversight prior to privatization.

International Cooperation

The promotion of international cooperation and coalitions amongst countries to combat corruption could prove very effective, and must be included as an essential component of NIS. International cooperation can help national leaders develop political resolve. The exchange and sharing of experience, resources and methods for detecting and controlling corruption between countries could be productive in terms of filling the gaps and providing the solutions that individual countries on their own could not obtain otherwise.

The industrial countries, the donor community, and the multilateral institutions must take the lead in fostering international cooperation in this respect, and provide the necessary resources to the developing countries to buttress their efforts for reform. This may involve providing specialized technical assistance – for example, by organizing high level anti-corruption workshops or strategic consulting, or hiring
international investigators to track down ill-gotten deposits overseas. Specifically for the donor community, this may necessitate the adaptation of their aid programs from being largely project-based to being policy-based, and to include corruption as part of their broader work on institutional strengthening and capacity building.

**Implementing NIS**

Taken together, the six building blocks of NIS discussed above appear overwhelming as they entail significant changes in the structure of existing economic and political institutions, in the nexus of relationships within the state and between the state and society, and in the existing policies and practices of governments. No government, in particular the PIC governments, has the capacity to simultaneously pursue reforms in all these areas. In this context, the successful implementation of NIS would depend critically on the following three requirements: proper sequencing of reforms; credible leadership; and sustainability of the anti-corruption program.

With respect to the first requirement, it should be noted that there is no simple formula for the proper sequencing of reforms. Because of the differences in the pattern and level of corruption between countries, the priority focus of NIS is likely to vary between countries and so will be the strategies and order of reform activities to be undertaken. As a guide, however, sequencing should be developed in response to the particular constraints identified in each country. It should be designed to tackle the incentives and institutions that favor corruption most and that have a cross-cutting impact on other activities.

A credible leadership is critical to the successful implementation of NIS. A serious anti-corruption program cannot be imposed from outside but requires committed leadership from within, ideally from the highest levels. Related to this is
the need to assess the political culture in order to evaluate the incentives and disincentives for change that will condition the feasibility of particular instruments of reform and the way they can realistically be carried out.

Finally, sustainability of the program hinges on three key conditions. First, there must be a “critical mass of mutually reinforcing reforms” that ultimately build into a comprehensive program. In order to be mutually reinforcing, the strategy must also be balanced. This suggests a mix of corruption prevention and enforcement measures, combined with substantial public involvement and education to strengthen the constituencies for reform. Second, sustainability requires the eventual development of a broad coalition in support of the strategy. This broad coalition is likely to come about if there is strong “local ownership” of the reform process. Finally, sustainability requires the resources and expertise to see often complicated reforms through to completion over the long haul, as well as deliver the results on a timely basis. In this context, it is necessary that governments assign adequate budgetary resources as well as competent administrators to underpin the implementation of anti-corruption programs.

III INSTITUTING A SECURE PROPERTY RIGHTS REGIME

The second most crucial component of institutional reform that has a direct bearing on the PIC economies is the establishment of secure and enforceable property/contractual rights. As discussed in the previous chapters, countries with insecure property rights regime have generally experienced difficulty in attracting foreign investment and have not been able to achieve or at least sustain high economic
growth rate. That is, the lack of well-defined and secure property rights increases investors’ risk and thus hinders the flow of domestic and foreign investment and capital formation. Because of their relevance to the PICs, the policy measures discussed below focus on property rights issues relating to land and institutional reforms within the judiciary.

**Securing Property Rights over Land**

Given the essential role that land plays in the broader process of economic development, as already discussed in previous chapters, it is critical that the state undertakes policy measures that underpin the development of secure property rights over land. This requires the instituting of a coherent system of property rights that guarantees security of tenure and transferability of title and ownership of land. A coherent system comprises land registration and titling systems, improved land leasing mechanisms, and a legal system that will guarantee the enforceability of such rights, as well as the commitment of the state to protect and sanction those rights.

Land registration and titling systems are perceived as an important element in a policy seeking to promote tenure security and development of an effective land market. In addition to establishing unambiguous ownership rights, written records allow verification of the ownership status of land at low cost, thus reducing the scope for asymmetric information about ownership and quality of land. It also makes land sales and rentals cheaper to implement. This reduction of transaction costs would increase the liquidity of the land market and should bring the number of efficiency-enhancing transactions closer to the optimum, i.e., helping to transfer land from less productive to more productive individuals.
In countries making a transition from communal to more individualized forms of land tenure, such as the PICs, there is a need for a flexible, stepwise, and decentralized approach that acknowledges differences in demand for tenure security based on diversity across countries. This implies the need for a legal framework that permits evolution of land rights towards individual tenure as the needs emerges with commercialization and land scarcity.

The existence of an independent and impartial judiciary that guarantees the enforceability of property and contractual rights is indispensable to the effective operation of a property rights regime. Without this, the property rights regime will be in shambles, even if the laws that purport to protect it are well designed (because the courts will not be effective in enforcing them anyway). Property owners/buyers and parties to contracts would not have the necessary legal recourse in the event of disputes or breaches of contracts. It is critically important, therefore, that an effective and independent court system is in place to provide legal sanctity to property rights, and hence ensures their credibility and enforceability. The policy options highlighted in Section II relating to combating corruption, in particular the existence of a competent, honest, and an adequately resourced bureaucracy, have direct applicability to controlling corruption within the court systems.

It has been argued that increased demand for land enhances the economic value of land and raises the demand for secure property rights (ADB, 1998a). In this context, it is advisable that the state undertakes policies that contribute to the enhancement of the value of land. One such policy is to remove impediments to market activity—liberalize trade, remove capital restrictions, simplify access to foreign investors, and deregulate the labor market. Such policies will, for a while, promote higher economic growth, and the growth will increase both the opportunity cost of land and the pressure for institutional change with respect to property rights.
The foregoing sections presented a comprehensive set of instruments that can be applied in the design of strategies or programs for combating corruption and developing an effective property rights regime. As already highlighted, the design of a program for institutional reform is country-specific, and its effective implementation requires a proper mix, prioritizing and sequencing of the reform activities within the program. In this section, an attempt is made to evaluate the applicability of the national integrity system (NIS) proposed above in the context of the PICs, and examine the efforts that the PICs have undertaken to date with respect to implementing the six pillars of NIS. It also outlines the policy measures that the PICs need to take in relation to the development of an appropriate property rights regime, taking into account the unique socio-economic features of these countries.

Measures to Control Corruption in the PICs

The national integrity system (NIS) discussed in Section II provides a useful operational framework for the development of an anti-corruption program for the PICs. However, given the marked differences in the level and pattern of corruption that exist amongst the PICs, it is important to recognize that the six pillars of NIS may not apply with equal force across countries. For instance, the levels of corruption in the smaller PICs, such as Kiribati and Tuvalu, are relatively modest, and are largely administrative (petty) in nature. On the other hand, corruption in the bigger island nations, such as Papua New Guinea and Fiji, is systemic, involving both petty and grand corruption as well as state capture. The challenge, therefore, for the design of an effective anti-corruption strategy for the PICs is how to prioritize, sequence, and
combine the six pillars of NIS with a view to developing the most effective strategy that recognizes the different contours of the corruption problem in each country.

With respect to the first pillar of NIS – comprehensive public sector reform (CPSR) – most of the PICs have undertaken far-reaching public sector reforms, mostly funded by the Asian Development Bank (Knapman et al 1999). However, in most cases, these reforms were triggered more by macroeconomic considerations rather than by the desire to address the underlying governance and corruption issues. The initial emphasis of the reform programs has been on addressing macroeconomic stability, beginning with bringing the fiscal situation under control. Given the crisis that triggered the initiation of the reform process, analysis of how governments worked has been generally inadequate, and therefore the specific constraints to greater efficiencies and effectiveness of the public sector have not been clearly identified. Moreover, there has also been inadequate inquiry into the capacities of the private sector to provide the assumed responses to public sector downsizing and the liberalization of policy frameworks.

In light of the limited scope of the public sector reforms that have been carried out in the PICs, there is a need for the PICs to make these reforms more comprehensive and to incorporate corruption as an integral part of the reform process. This implies instituting, where appropriate, the building blocks of a comprehensive public sector reform discussed in Section II. The building blocks of CPSR that are most relevant to the PICs include: instilling a meritocratic civil service; introducing ethical codes in the public sector; enhancing predictability, transparency and accountability in fiscal management; improving procurement procedures; and policy and program rationalization.60 Within these building blocks, the relevant policy

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60 A detailed discussion of the specific policy actions that need to be taken for each of these building blocks of PSR is beyond the scope of this study.
actions that need to be undertaken include: strengthening information systems, particularly those relating to financial management to enhance transparency and accountability; strengthening internal and external audit functions; strengthening establishment management and control for civil service positions; decompressing pay scales and improving employment conditions throughout the civil service; reducing the number of exemptions and allowances to make remuneration more transparent; improving procedures for recruitment and promotion; and drafting and enforcing a code of ethics that should bind civil servants, especially those in positions of influence.

In parallel, the efficiency and effectiveness of the public sector can be improved while simultaneously reducing opportunities for corruption by narrowing its scope for intervention. That is, as the sphere of state activities decreases the opportunities for soliciting bribes will also decrease, and hence the level of corruption. While most of the PICs have initiated comprehensive privatization programs, little headway has been achieved to date in implementing those programs due to policy changes and the reluctance of private entrepreneurs to take over unprofitable enterprises, particularly given the typical constraints facing private sector activities in these economies.

Turning to the second pillar of NIS – strengthening institutional restraints – there is a need to address this issue more vigorously in the PICs. While the basic framework for institutional restraints is already in place in most of the PICs, the key institutions (the judiciary, audit office, and the office of ombudsman) tasked with this role have not been as effective as they should be. Political interventions, inadequate allocation of financial and human resources, and the absence of a competent, professional and honest bureaucracy have been cited as key factors inhibiting the effective functioning of these institutions in the PICs (ADB, 1998)
It is incumbent upon the governments of the PICs, therefore, to undertake policy and legislative reforms that would strengthen institutional restraints by protecting the independence of the three institutions referred to above and enhancing the effectiveness of their restraining roles. Some policy initiatives that can contribute towards this end include strengthening the parliament’s oversight functions and improving the capacity of parliamentary institutions, such as supreme audit agencies and the office of the ombudsman,\(^{61}\) to function effectively. The latter presupposes the provision of the requisite resources, financial and human, and the necessary legal infrastructure that will facilitate the effective execution of the responsibilities of these institutions. Measures for legal and judicial reform, such as efforts to reduce judicial backlogs, or to improve courtroom management to ensure that cases can be heard on a timely basis, or to enhance the independence and professionalism of the judiciary – will all have positive externalities in the fight against corruption.

The PICs need also to consider a rule-based approach proposed by Posner (1998), referred to in Section II, as part of their strategies for judicial reform. Given their limited resources, the PICs may benefit more by focusing judicial reforms on creating procedurally simple rules (and laws) rather than on creating first-class judiciaries.\(^{62}\)

The third pillar of NIS – coalition building and strengthening civil society participation – is quite novel to the PICs, and something that they need to seriously consider as part of their anti-corruption strategies. By opening channels through which civil society and government stakeholders can demand greater accountability from each other, this approach can generate and sustain a citizen-government dynamic

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\(^{61}\) Some of the PICs, e.g. Kiribati and Tuvalu, do not have an ombudsman within their civil service. 

\(^{62}\) This may be easier said than done in the case of the PICs. Given that most, if not all, of the PICs inherited the laws/statutes from their colonial masters, the task of simplifying those laws would be onerous. It requires highly competent and well-motivated lawyers to do this job well. Thus, the trade-off between investing in simple rules and in having a first-class judiciary is blurred in the case of the PICs.
that will substantially buttress anti-corruption programs. The raising of public awareness is an important component of this approach, and the PICs should be able to implement this through public seminars, conferences and the media, which the donors can support and fund.

With respect to the fourth pillar of NIS - promoting a free and independent media - the experience of the PICs in this respect is mixed. Though most countries in the region have a free and open press, many factors continue to weaken the media's potentially powerful contribution to limiting corruption, including: lingering state controls; conflicts of interests generated by ownership arrangements; and corruption in the media. In Kiribati and Tuvalu, for example, the government is the sole media owner and operator, and monopolizes printing and the supply of paper - which can undermine the media’s independence. As mentioned in Section II, a prerequisite for building a free media is a legal system that is independent of political influence and has firm constitutional support for a free press. The PICs need, therefore, to take more stringent measures to strengthen the independence of the media, possibly through privatization and the passing of appropriate legislation that explicitly protects freedom of expression.

Turning to the fifth pillar of NIS, the role that the private sector plays in the PIC economies is very limited. As already mentioned, the level of corruption within the public sector decreases as the scope for state intervention decreases. The development of a vibrant and competitive private sector could, therefore, provide an effective mechanism for reducing the scope of corruption in the public sector. In this context, it is recommended that the PICs continue to support policies that strengthen the role of the private sector in the economy, and promote greater competition within the private sector. The policy initiatives that the PICs may take in this respect include privatization and the promotion of foreign investment. The latter can be achieved by
limiting the role of public investment; providing a secure environment, including law and order, and secure access to land; providing good infrastructure; ensuring that contracts are enforceable; and maintaining consistency, transparency and automaticity of rules.

Finally, on the sixth pillar of NIS – international cooperation - it is in the interest of the PICs to avail themselves of the experience and support of the international community in their fight against corruption. The increasing integration of the PICs into the global economy means that the PICs are increasingly vulnerable to corrupt activities from abroad in the form of illegal transfers of funds to and from the countries, either through money laundering or embezzlement. For countries like Kiribati with a substantial amount of investment abroad, corruption in the management of those funds not only by the fund managers but also by the politicians, is a big worry. The assistance of the international community in supporting an anti-corruption program towards this end is, therefore, of critical importance.

**Measures to Promote Secure Property Rights in the PICs**

As explained in Chapter 5, gaining secure title to land presents difficulties in most of the PICs because of widespread customary ownership and the lack of development of effective leasehold regimes. Recall that this traditional form of ownership does not provide a formal form of ownership but only ensures that all family and clan members have access to land. The increasing uncertainty over security of tenure and rights of ownership to land associated with communal ownership imposes severe constraints on both domestic and foreign investments, and hence on the growth prospects of these economies. It is important, therefore, to consider what role the states can play in promoting and enforcing institutional change
that will foster more secure and exclusive individual rights to land? In dealing with this question, it should be recognized that introducing individual property rights in land in the PICs is not easy, given the strong cultural affinity with common ownership and the high values that the PIC communities attach to communal sharing. Given this constraint, it would be prudent for the PICs to create the conditions for a market-based economy to flourish and allow the property rights regime to evolve, rather than attempting to take a stronger line in changing the property rights system.

Despite the inherent social constraints associated with communal ownership as outlined above, there is scope for selective reforms or arrangements that can facilitate access to land and at the same time create conditions for a move towards a more formal and well defined system of individual tenure. The first such approach is for the PICs to undertake policy reforms that may contribute, albeit indirectly, to the enhancement of the implicit value of land. The premise is that such reforms may result in an increase in the demand for secure access to land, thus driving up land rents and the demand for institutional change with respect to property rights. Such reforms include the removal of impediments to market activity through trade liberalization, removal of capital controls, streamlining of investment procedures, and the deregulation of the labor market. Improved infrastructure (roads, telecommunications, and utilities) can also increase the demand for improved property rights and contract enforcement. Improved transport access raises the implicit value of land by lowering the cost of delivering inputs and outputs. Access to technology that increases the productivity of land will also raise the implicit rental value of land, and hence the demand for an effective property rights regime.

The second approach is the establishment of appropriate administrative and legal infrastructure that would facilitate the efficient operation of markets for land. This entails the development of a sound land registration and leasing system and
effective mechanisms for resolving disputes. It also requires the provision of technical assistance and training to support the development of land titling. In particular, assistance should be given in designing contracts that will minimize disputes where customary landowners are involved. Problems that need to be dealt with involve intergenerational sharing of the payment from the use of land, resolving conflicts between different claimants to the land, and dealing with biodiversity and environmental issues.

As mentioned in Chapter 5, only a small proportion of the land in the PICs has been registered. With the existence of an effective market and/or administrative mechanism through which land transactions and disputes could be carried efficiently and at minimum cost, there is likely to be greater pressure on the land-owners to ask for a more formal and well defined form of ownership. This, in turn, promotes greater security and exclusivity of land tenure - leading to investors having greater confidence to invest.

A system initiated by the government of the Marshall Islands provides a template worthwhile considering throughout the PICs. Under this system, the land registration board was established by law with the authority to accept applications from landowners for registration of land that would be available for investors to lease and make provision for objections, referral of disputes for resolution, and the issuance of certificates of registration. To provide security of contract, the Board would guarantee leases to ensure uninterrupted use. As well, it would provide standardized lease forms and negotiation or mediation between landowners and investors upon request. But once a lease has been registered, the government would ensure that there would be security of title for the leaseholder.

The Marshall Islands model is a smart innovation and has the potential to greatly improve investors’ perception about the possible risks relating to land rights.
security and enforceability of contracts. Other governments in the region may also benefit from the application of this model. The ability of governments to ensure the effective functioning of such an institution (model) will be a test of their capacity to define and enforce property rights and contracts. It must be emphasized that unless such an institution is well protected by law and free from corrupt practices, its role as the enforcer of property rights and contracts may be of little value.

The third and final policy initiative, which is complementary to the second approach, is to encourage the PICs to be members of the International Center for the Settlement of Investment Disputes (ICSID). This would allow foreign investors access to some form of international arbitration mechanism, thus protecting them from breaches of leases, attacks, damage and seizure of assets. Thus far, only a few PICs are members of ICSID. The confidence of foreign investors to invest in the PICs may be boosted if they know that they have some form of legal recourse at the international level that they can refer to for arbitration and recompense.

In summary, the prevalence of customary ownership of land throughout the PICs means that there is limited opportunity for the establishment of individual tenure over land. In this scheme of things, the most logical and feasible approach in promoting a property rights regime is to maintain the status quo. That is, the governments should not seek to change this communal form of ownership, but instead should find ways of putting in place the conditions that would allow the property rights regime to evolve, and that would generate pressure for more formal and well-defined property rights. Thus, the key objective of reforms with respect to the property regime in the PICs is not one of changing land tenure system per se, but of unlocking land tied up in unproductive uses because of inflexible rules governing its ownership and use.
IV Summary and Concluding Remarks

The deleterious effects of corruption and an insecure property rights regime on economic growth and development have long been recognized, and have assumed a place of greater importance in the development agenda of the developing countries. However, efforts by the governments of these countries to address these problems through appropriate policy and institutional reforms have often been found wanting. This is largely because of the lack of proper diagnosis of the underlying causes of these institutional problems, and hence the failure to formulate an operational framework that would inform the development of an appropriate reform strategy.

As highlighted in the foregoing discussions, the pervasive nature of systematic corruption suggests that the strategies needed to combat corruption must be broadly based and involve action on many fronts. This implies that any effort to fight corruption, if it were to succeed, needs to be truly comprehensive in its scope and approach, and underpinned by a host of mutually reinforcing reforms. The development of a national integrity system (NIS) would be a move in this direction, although its design and focus needs to be adapted to reflect the specific pattern and contour of the corruption problem prevailing in each country. It must be recognized, however, that the implementation of comprehensive anti-corruption programs, such as NIS, entails wholesale restructuring in the existing social, economic and political institutions, of which no government has the capacity to implement all at once. In this connection, prioritization is critical. There is a need to determine how the reform activities within NIS may be combined, sequenced and prioritized, taking into account the corruption landscape and the institutional set-up in each country.

Given the resource constraints and differences in the pattern and level of corruption in the PICs, for NIS to be successfully carried out in these economies,
there needs to be a proper assessment of what pillars of NIS are necessary and
sufficient for success and what sequencing of reform is economically, politically and
bureaucratically desirable and feasible. The same goes for programs concerning the
development of institutions for a workable and effective property rights regime in the
PICs, although, in this case, the priority focus and sequencing order is more clear-cut.

As discussed above, the system of communal ownership of land that prevails in most
of the PICs stifles private investment and retards economic growth. It is imperative,
therefore, that the PICs undertake, as a matter of priority, appropriate reform
measures that would ultimately improve access to the use of land for productive
purposes without necessarily disrupting the cultural values of communal ownership.
The adoption of the Marshall Islands model discussed in Section IV could contribute
greatly towards this end.

It is important to note, however, that in applying to the PICs a set of policy
and institutional reforms, such as those recommended above, it is appropriate to
identify the special features of the PICs that might call for a modified design and
implementation of such reform strategies. Care should be taken to avoid taking
specific institutions that work elsewhere only because of the broader context in which
they are embedded, or imposing institutions that are not compatible with local
conditions.
This study set out to critically assess the role that institutions play in the growth performance of the Pacific Island countries. The two key questions addressed in the study were:

1) To what extent do institutions, or the qualities thereof, contribute to the growth performance of the PICs?
2) How may the effectiveness of institutions be measured in the context of the PICs?

While recognizing the contributions of the traditional determinants of economic growth such as capital, labor and technology, as well as policy and the physical, resource and market constraints facing these economies, the study argued that ultimately it is neither the lack of capital nor ineffective policies that constrains the economic growth of the PICs, but rather the lack of incentives to accumulate and deploy these resources well and effectively. This proposition implies the lack of appropriate institutions in the PICs to facilitate the provision of incentives that would make policies and resources effective. It also suggests that smallness and lack of resources need not be a major constraint to the economic growth of the PICs as long as institutions and the right policies are in place. Thus, the central hypothesis of the study is that the constraints to economic growth in the PICs are not so much about the lack of capital, commitment and support (as they are well blessed with all of these); rather they are about content, detail and design. That the PICs continue to perform
poorly, in spite of their being blessed with high levels of foreign aid and favourable trading arrangements, is because of their governments' failure to provide the kinds of institutions and policies needed to internalize such external benefits.

The biggest challenge in testing this key proposition of the study was the task of operationalizing the term 'institution' and how to measure it to allow empirical analysis of its growth effects. For this purpose, the study used three indicators of institutional effectiveness based on the level of corruption, property rights security (and contract enforceability), and civil liberty. This choice of indicators was predicated on the premise that when institutions are weak, corruption is likely to be prevalent, security of property rights is poor and civil liberty is constrained. But the identification of these indicators of the quality of institutions does not completely solve the problem of providing a quantitative measure of institutions. This is because of the abstract nature of these indicators, which leaves unresolved the problems of measurement. Given this difficulty, the study developed measures for these proxy variables, in particular for corruption (since alternative measures for property rights security and civil liberty are available, as discussed in chapters 7 and 8).

While the perception measures/indices for corruption and other institutional variables provided by private rating firms and international organizations, such as Transparency International and the World Bank, have proved useful in empirical research, they do not include the Pacific Islands. This meant that these indices could not be used for the analysis. More importantly, it meant that the study had to carry the formidable task of developing alternative measures for corruption that are relevant to the PICs.

In developing alternative measures for corruption, the study used what it called the output-based approach. Under this approach, those public finance variables perceived to be highly susceptible to corrupt or rent-seeking practices were
selected. These included: the ratio of government consumption to GDP; the ratio of public subsidies to GDP; the ratio of government expenditure on economic services to GDP; the ratio of external debt to GDP; and the variability of public capital expenditure as measured by its coefficient of variation. The selection of these public finance variables was based on the presumption that corrupt governments tend to have high levels of government consumption expenditure, subsidy, and public debt, and experience a high degree of public investment variability and government intervention in private sector activities. To justify the use of these variables as the constituent elements of the study’s corruption index, factor analysis as well as a comparative analysis of the levels of these variables in the seven PICs were carried out – the results of both of which suggest linkages between the levels of these variables and the incidence of corruption.

From this set of public finance variables, a composite corruption index was derived using Principal Component Analysis. The result was the composite corruption index used in the regressions presented in Chapter 8. The construction of this composite corruption index is an important innovation and major contribution of the present study. Unlike the corruption indices developed by Transparency International and other private risk-rating organizations - which are based on perceptions and therefore highly qualitative - the corruption index developed in this study is based on hard data. It has the advantages therefore of being more objective and easier to apply to a country without the need to conduct in-country surveys.

The indicator used for property rights security and contract enforceability is based on the contract-intensive-money (CIM) approach developed by Clague et al (1999). For the civil liberty variable, the index is based on the Freedom House evaluation of the civil and political freedom that the citizenry of countries enjoy.
Using these three indicators for institutional effectiveness, the study proceeded to estimate the impact of the effectiveness of institutions on the economic growth rate of the PICs. The empirical tests carried out were based on data from the seven Pacific Island countries – Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu – covering the 10-year period 1983-92. All in all, the results of the tests lend significant support to the central hypothesis of the study, namely, that the quality of public institutions plays a crucial role in the growth performance of the PICs.

These results represent an important breakthrough in terms of providing empirical evidence of the role that effective institutions play in the growth performance of the PICs. For instance, the point estimate for the property rights variable (CIM) suggests that a one standard deviation increase in the level of security over property and contractual rights produces an increase in income growth rates of approximately 3 percentage points, holding the other variables constant. Likewise, holding the other variables constant, a one standard deviation increase in the amount of freedom that the citizens enjoy is expected to cause an increase in the economic growth rate by approximately 2 percentage points. Finally, other things being equal, an increase of one standard deviation of the level of corruption produces a reduction in the per capita GDP growth rate by approximately 2 percentage points.

The study extended the analysis on corruption and explored the different channels through which corruption affects economic growth. The two channels identified were public investment and the size of the public sector (as measured by the level of government expenditure on public administration). The basic argument is that, because of its susceptibility to corrupt and rent-seeking practices, public investment in most of the Pacific islands countries is vulnerable to distortion, hindering its quality and productivity. Likewise, because of corrupt motives, the public sector in these countries tends to be over-sized either because of improper
recruitment policies or because of the excessive intervention of government in what would otherwise be private sector activities.

With respect to corruption and public investment, a strong, positive relationship between these two variables was found. The point estimate on the corruption variable suggests that a one-standard deviation increase in the level of corruption is expected to cause an increase in the level of public investment by approximately 16 percentage points. This is a rather large figure but not necessarily suspect given the preponderance of the government sector in the economies of these countries. This result may help explain why public investment in most of the countries in the South Pacific tends to have a neutral, if not negative, effect on growth. That is, the corrupt and rent-seeking elements tend to distort the composition and quality of public investment.

With respect to corruption and the size of the public service, there was also a very strong, positive relationship between the size of public administration and the level of corruption. Interpreted literally, the point estimate on the corruption variable suggests that a one standard deviation increase in the level of corruption is likely to lead to an increase in the size of the public service by approximately 6 percentage points. Again, this is a rather large figure, but if it were realistic it would underpin the earlier results about the unrelenting grip of the government on those activities that could be more effectively handled by the private sector.

Qualifications

As in any empirical work of this nature, the findings and the underlying methodology employed by the study are subject to inherent shortcomings. A caveat is, therefore, in order at this juncture. First and foremost, it must be emphasized that
these results provide only preliminary and suggestive evidence of the role of institutions in the growth process of the PICs. Definitive conclusions about the validity of these results depend to a great extent on the efficacy of the measures employed in the study for corruption, property rights security and civil liberty – the three indicators of institutional effectiveness used.

Secondly, the composite corruption index developed by the study, which was based on a set of public finance variables perceived to be highly vulnerable to manipulation and appropriation by the policymakers, must be treated with great caution. While it is generally true that the levels of these public finance variables are not always indicative of the corrupt and rent-seeking motives of the government officials and politicians, especially in countries where the state operates within a framework of good governance – accountability, transparency and predictability – the opposite is true for some countries. The latter refers to most of the developing countries including the PICs, where the government is the major player in the economy with all the monopolistic powers and discretions, and often lacks accountability and transparency in the exercise of its powers pertaining to the management of the country’s resources. In this case, there is a high probability for arbitrary practices on the part of the government officials, leading to arbitrary and overblown public expenditures. Thus, the bottom-line is that if this corruption index is to be used in empirical research, regard should be had to the context and environment from which the constituent elements of this corruption index originate to avoid inappropriate application and interpretation.

One other important and related criticism that may be levied against the outcome approach employed in the study for the construction of the corruption index is the fact that it may be drawing too much from rather simple and perhaps spurious correlations between the variables. This criticism may be counteracted as follows.
First, such criticism is equally applicable to the perception measures of corruption that have been used by Transparency International and others. That is, the latter measures are also based on the "correlates" of corruption as perceived by the rating firms or the people being surveyed, which include most, if not all, of the variables considered under this approach. Second, since the variables used under the outcome-based approach are only proxies for corruption, the results of the estimations based on these proxy variables reflect only suggestive, rather than definitive, evidence of the existence of corruption.

Thirdly, the shortcomings related to the reliability of the data, together with the limitations of the estimating method used in the analysis, must be taken into account when drawing inferences from these results. Of the seven Pacific Island countries under study, only Fiji has a fully developed statistical bureau and hence with reasonably reliable data. These data deficiency problems compelled the analysis to be carried out on the basis of pooled data (cross-section time series), using the pooling method developed by Parks (1967) and Kmenta (1986). The rationale for pooling was to boost sample size and thereby enabling more reliable estimations with the data. However, the adoption of such a pooling technique presupposes that the cross-sectional units in the sample have the same production function. This condition is difficult, if not impossible, to meet in practice and thus the overly simplifying assumption of homogeneous production functions for the seven PICs has to be adopted to make the analysis possible. In any case, this is a reasonably valid assumption for most of the PICs, given the comparatively similar state and level of technology that prevails in these island economies.

Fourthly, it may be argued that the measure for property rights security and contract enforceability based on the contract-intensive-money (CIM) approach is not an accurate measure of the effectiveness of the property/contractual rights regime in
the case of the PICs, given the smallness and rudimentary nature of the financial sector in these island economies. Also, it may be argued that, in the context of the PICs, property rights issues mainly refer to land rights. As such, it may be argued that the *CIM* measure, with its monetary focus, is not an accurate reflection of the level of security over land rights matters in the PICs. However, in the absence of better measures or indicators of property rights security for the PICs, the *CIM* index is the only workable, albeit imperfect, measure at this stage.

Finally, it is important to recognize the limitations of indicators, such as the ones used in this study, in empirical research. Most importantly, indicators are not the ends in themselves; rather they are the means for decision-makers to raise questions and highlight issues for further decision and investigation in light of local, country-specific knowledge. As such, indicators are not precise measures of the variable being measured - they do not tell the full story. Thus, any inferences that may be drawn from the results of this study should bear in mind these limitations.

**Conclusions of the Study**

Save for the possible shortcomings of the study, what do the results imply for the growth prospects of the PICs? More than anything else, the results suggest that corruption, civil liberty and property rights security do play a major part in the growth performance of the PICs. They underscore the point that without an effective institutional environment within which capital and policies could be deployed, the maximum pay-offs from these resources will not be realized. That is, policy reforms and resource utilization can only have positive synergies if they are carried out in conjunction with actions to improve the institutional environment.
Moreover, the results make an important contribution, and possibly answers, to the ongoing debate over the so-called ‘Pacific Paradox’ – the PICs’ continued slow economic growth in spite of favorable levels of natural and human resources, high levels of foreign aid and public investment, and a reasonably prudent economic management. Based on these findings, the study contends that ‘Pacific Paradox’ is largely an institutional problem – implying that any effort to address this paradoxical economic performance of the PICs must begin by addressing the institutional roots of the problem. These conclusions are consistent with the stance propagated by the World Bank, IMF and the Asian Development Bank regarding the growth strategies that the PICs should pursue. They are also shared by Duncan et al (1999) when they argue that per capita income in the PICs could move to levels several times higher if only they could put in place the right policies and institutions.

To sum up, the main conclusions from the study can be summarized as follows:

- The continued poor economic performance of the PICs is fundamentally related to the level and quality of the institutional environment within which these island economies operate. This is evident not only in the high statistical significance of the estimated parameters for the institutional variables, but also in their resilience and robustness to data transformation and changes in model specifications.

- It is not enough to have the right economic policies on the ground *per se* in order to promote growth. Such economic policies will be of limited value unless they are underpinned by a strong and secure institutional environment.
By implication, the so-called 'Pacific Paradox' is largely an institutional problem. Unless the PICs can push through the necessary institutional reforms with a view to putting in place the conditions for broad-based, sustained economic growth, they will continue to live out the 'Pacific Paradox'.

These conclusions suggest that while inducing economic growth in the PICs is a formidable task, given the severe resource and structural constraints they face, it should not be a cause for despair. Incomplete though our understanding still is, enough has been learned from the development experience of the more successful small island states elsewhere to justify a hopeful conclusion. It is this: rapid and sustained economic growth and development for the small island states is not a hopeless dream, but an achievable reality provided the right policies and institutions are in place. As demonstrated by the results of this study, the PICs are not exceptions. By undertaking the necessary institutional reforms within the framework of the National Integrity System (NIS) discussed in Chapter 9, the PICs are capable of improving their growth performance. More specifically, by intervening less where they may (e.g., in production), and more where they must (e.g., in environmental protection and education), by strengthening institutions, in particular the property rights regime, and by fostering checks and balances in governments to minimize corrupt practices, the PICs can transform their growth prospects and development outlook.
Suggestions for Future Research

In order to provide further proof on the efficacy of the results reported in this study, there is a need for further work on the development and application of alternative indicators of the effectiveness of institutions. In particular, it would be desirable to consider other hard-data based measures of corruption such as revenue arrears, level of government expenditure on regulations, the differentials in the wage rates between the public and private sectors, aid leakages, or expenditure on infrastructural maintenance – as discussed in Chapter 7. For the property rights security measure, it would be desirable to include alternative measures that are more directly appropriate to the PICs. Since the issue of property rights in the PICs relates mainly to land rights, proxies such as the proportion of court cases relating to land disputes, and court efficiency and effectiveness as measured by the backlog of legal cases and budgetary allocation to the judiciary, respectively, may be more relevant. Data availability could be the main constraint to the use of these other indicators, however.

Secondly, as a further test of the validity and robustness of the empirical results of this study, it would be necessary to re-run the regressions using cross-sectional data covering several countries. Likewise, it would be interesting to see how the measures for institutional effectiveness used in this study compare with the perception measures developed by Transparency International (TI) and other risk-rating agencies in terms of their levels of correlation. A high level of correlation between these measures would imply that the measures are comparable in terms of the amount of information they contain about the variable they seek to measure, and thus it would not matter which measure one uses. This is an exercise that would have been carried out in the present study but for the exclusion of the PICs from the TI country surveys, and hence from their institutional indices.
Finally, it would be interesting to carry out the same analysis using the *Unobserved Components* and the *Hufner & Shah* models discussed in Chapter 7, but reformulated on the basis of a Principal Components Analysis (PCA) framework. This would provide further support for the use of the PCA approach in the construction of aggregate measures.
APPENDICES
APPENDIX 1

Selected Empirical Studies On Institution-Economic Growth Relationship

<table>
<thead>
<tr>
<th>RESEARCHER</th>
<th>DEPENDENT VARIABLE</th>
<th>INDEPENDENT VARIABLES</th>
<th>ESTIMATION TECHNIQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knack and Keefer (1995)</td>
<td>(i) Per Capita GDP Growth rate</td>
<td>Constant, ICRG82, BERI72, Assassination, Revolution and coups, Secondary education enrolment, Primary education enrolment, Government consumption, Deviation of investment price level (relative to US level) from mean</td>
<td>OLS Cross-section, 1974-1989</td>
</tr>
<tr>
<td></td>
<td>(ii) Private investment/GDP</td>
<td>As in (i) above</td>
<td>As above</td>
</tr>
</tbody>
</table>

**Remarks:** ICRG82 is a sum of the 5 institutional variables: Quality of bureaucracy, Corruption, Rule of law, expropriation risk, and Repudiation of contracts by government - obtained from ICRG (Political Risk Group). BERI72 is a sum of the 4 institutional variables: Bureaucratic delays, Nationalization potential, contract enforceability, and Infrastructure quality - produced by BERI. This study does not take account of the endogeneity bias problem.

| Paulo Mauro (1995)          | (i) Total investment/GDP 1980-85 | Constant, Corruption index (B1 Index) | OLS Cross-section, 2SLS |
|                            | (ii) Total investment/GDP; Different components of Total investment | Constant, Corruption Index, Bureaucratic efficiency, and Institutional efficiency | As above |
|                            | (iii) Total investment/GDP 1960-85 | Constant, GDP1960, Secondary education1960, Primary education 1960, Government expenditure/GDP, Revolutions and Coups, Assassinations, Investment deflator (at PPP), and its deviation from the sample mean in 1960, Bureaucratic efficiency, Political stability, Corruption, and country dummies, including dummies for high and low bureaucratic efficiency. | As above |
|                            | (iii) Per capita GDP Growth | As in (ii) above, without dummy variables for high and low bureaucratic efficiency | As above |

**Remarks:** “Bureaucratic efficiency” is an average of the scores on judiciary system, red tape, and corruption. “Political stability” is a composite index incorporating indices for institutional change, social change, opposition take-over, stability of labor, relationship with neighbouring countries, and terrorism. “Institutional Efficiency” combines both the Bureaucratic efficiency and Political stability indices above.

| Rodrik (1997)              | (i) Institutional quality | Constant, Log GDP 1960, Average years of education (1965), Ethnolinguistic fractionalization (ELF), or Gini coefficient | 2SLS |
|                           | (ii) Growth of output per capita | Constant, Log GDP 1960, Average years of education, Institutional quality | 2SLS |
|                           | (iii) Capital accumulation | As in (ii) above | 2SLS |
|                           | (iv) Total factor productivity (TFPG) | As above | 2SLS |

**Remarks:** Regressions are estimated using instrumental variables, with log of income in 1960, years of education in 1965, and ELF in 1960 as instruments for institutional quality. The “Institutional quality” is a composite index incorporating indices for quality of bureaucracy, rule of law, risk of expropriation, and repudiation of contracts by governments.

| Tanzi and Davoodi (1997)   | (i) Public investment/GDP | Constant, Corruption, Real per | OLS Cross-section |

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<p>| Remarks: The corruption index is derived from BI (1980-83) and ICRG (1982-95) as rescaled. The “other goods and services” is used as proxy for expenditure on operations and maintenance. No test for possible endogeneity bias is made. |  |
|---|---|---|
|  | (ii) Expenditure on education/GDP, Expenditure on education/Consumption expenditure, Expenditure on health/GDP | As above, including Population 5-20/Total Population | OLS and IV estimation |
| Remarks: All dependent variables are expressed as ratios to GDP unless otherwise stated. The instruments used in regression (iii) are ELF, the black-market premium, ratio of sum of imports plus exports to GDP, oil dummy, and two colonial dummy variables. The Corruption index is the simple average of the corruption indices produced by Political Risk Services (IRIS). |  |
|  | (ii) Government Performance and Religion: As in (i) above | ELF, Catholic, Muslim, and Other denominations, Latitude, Log GNP per capita | As above. |
|  | (iii) Government Performance, Legal origin and Religion | All the independent variables in (i) and (ii) combined | As above. |
| Remarks: The indicators for “Interference with private sector” include property rights index, business regulation index, and the marginal tax rate in 1994. The “Efficiency indicators” include corruption, bureaucratic delays, tax compliance, and average government wages/GDP per capita. The “Indicators for the quality of output of public goods” include log of infant mortality, log of school attainment, literacy rate, and infrastructure quality index. The “Indicators for the size of public sector include transfers and subsidies as % of GDP, government consumption as % of GDP, state-owned enterprises (SOE) in the economy, and public sector employment/total population. |  |
| Hall and Jones (1999) | (i) Log of output per capita | Constant, Social infrastructure | OLS Cross-section, IV estimation |
|  | (ii) Reduced form: Social Infrastructure, and Log of output per worker | Instruments: Distance from the equator, Log of trade share, Fraction of population speaking English, and fraction speaking other European languages | OLS |
|  | (iii) Log of physical capital per capita, Log of human capital per capita, and Log of productivity (See Table 4) | Constant, Social infrastructure | IV Estimation |
| Remarks: “Social Infrastructure” is a composite measure incorporating the Knack and Keefer (1995) indices and Sachs and Warner trade openness measure. The instruments used in regressions (i) and (iii) are those instruments (regressors) in regression (ii) |  |
| Kaufmann et al (1999) | (i) Log of per capita GDP at | Voice and accountability, Political | 2SLS |</p>
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ii) Infant mortality (per 1000 live births)</td>
<td>As above</td>
</tr>
<tr>
<td>(iii) Adult literacy rate in %</td>
<td>As above</td>
</tr>
</tbody>
</table>

**Remarks:** Separate regressions are run for each of the indicators of governance: Voice and Accountability, Political Instability and Violence, Government Effectiveness, Regulatory Burden, Rule of Law, and Craft.

**Clague et al (1999)**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIM and the financial sector: Insurance/GDP; Finance GDP</td>
<td>Constant, Initial log GDP per capita, CIM, ICRG, and BERI</td>
<td>OLS Cross-section</td>
</tr>
<tr>
<td>CIM and levels of output, factor accumulation and TFP: Log output per worker; Log capital per worker; School per worker; and log TFP</td>
<td>Constant, CIM or ICRG and other regressors as in Hall and Jones (1999): Latitude, % English speaking; % speaking another international language, dummies for capitalist systems, and trade openness index</td>
<td>As above</td>
</tr>
<tr>
<td>Per capita GDP growth</td>
<td>As in (iii) above but excluding the Price level of investment goods and replacing it with Investment/GDP 1969-90</td>
<td>OLS and 2SLS</td>
</tr>
</tbody>
</table>

**Remarks:** CIM stands for contract-intensive money - meaning the ratio of non-currency money to total money supply as described in the text. The instruments used in regression (iv) include the other RHS variables (currency depreciation, initial income, and schooling), the % of a country’s population belonging to the largest ethnic group, and a set of colonial heritage dummies.

**Leites and Weidmann (1999)**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP growth rate per capita</td>
<td>Corruption, initial income, natural resources, trade openness, investment/GDP, terms of trade, rule of law, Africa, commodity price variability in Africa, commodity price variability in non-Africa.</td>
<td>OLS, 2SLS</td>
</tr>
</tbody>
</table>

**Remarks:** Res = the residuals from regressing each of the components of natural resources (e.g. Res-Fuel 1970) on a set of geographical dummy variables.

**Helene Poirson (1998)**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private investment</td>
<td>Real GDP per capita (in % and lagged one period), Log of real GDP per capita (lagged), Population growth (%), Secondary school</td>
<td>Panel Estimation (Random Effect), and OLS Cross-section</td>
</tr>
<tr>
<td>Enrolment (%)</td>
<td>Nominal private fixed investment in % of nominal GDP</td>
<td>Nominal public fixed investment as % of nominal GDP</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>(ii) Real GDP per capita growth (%)</td>
<td>As in (i) above</td>
<td>2SLS</td>
</tr>
</tbody>
</table>

Remarks: Country dummies, lagged values of private and government investment rates plus all other RHS regressors and country and time dummies are used as instruments.
# Definition of Variables and Data Sources

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of countries</th>
<th>Variable Description</th>
<th>Source</th>
<th>Date Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDPL</td>
<td>7</td>
<td>Log of real GDP per capita growth rate calculated by converting current GDP into US dollar equivalent first and then applying the 1995 CPI</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>ECSGDP</td>
<td>7</td>
<td>Log of the ratio of those activities carried out by government but supposed to be carried out by the private sector to private sector GDP. These include manufacturing, mining, electricity and transportation</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>GOVTC</td>
<td>7</td>
<td>Log of the ratio of government consumption expenditure to current GDP</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>SUBGDP</td>
<td>7</td>
<td>Log of ratio of subsidy by government to current GDP</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>CAPCV</td>
<td>7</td>
<td>Coefficient of variation of capital expenditure using a 3-year period</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>ECONTE</td>
<td>7</td>
<td>Log of ratio of government expenditure on economic services to total expenditure</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>SUBTE</td>
<td>7</td>
<td>Log of expenditure on subsidies to total expenditure</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>DEBT</td>
<td>7</td>
<td>Log of public debt to current GDP</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>CRRPT1</td>
<td>7</td>
<td>Geometric mean of the corruption variables: ( ECONTE, SUBGDP, GOVTC, ) and ( DEBT )</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>CRRPT2</td>
<td>7</td>
<td>Geometric mean of the corruption variables: ( ECSGDP, SUBDE, GOVTC, ) and ( DEBT )</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>CRRPT3</td>
<td>7</td>
<td>Geometric mean of the corruption variables: ( CAPCV, ECONTE, SUBGDP, GOVTC, ) and ( DEBT )</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>CRRPT4</td>
<td>7</td>
<td>Geometric mean of the corruption variables: ( CAPCV, ECSGDP, SUBTE, GOVTC, ) and ( DEBT )</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>CRRPT</td>
<td>7</td>
<td>The Corruption Index based on the first principal component of the corruption variables: ( ECSGDP, GOVTC, SUBGDP, CAPCV, SUBTE, ECONTE, ) and ( DEBT ). The standardized values of the variables are used.</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>CIM</td>
<td>7</td>
<td>Log of ratio of non-currency M2 to total M2. [The figures for Kiribati are based on the Kiribati Government (Ministry of Finance) estimate].</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>FREE</td>
<td>7</td>
<td>The average of the scores for political rights and civil liberty as re-scaled. See text.</td>
<td>Freedom House</td>
<td>1983-1992</td>
</tr>
<tr>
<td>POPG</td>
<td>7</td>
<td>Log of annual mean of population growth rate</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>GDI</td>
<td>7</td>
<td>Log of ratio of gross domestic investment to current GDP</td>
<td>IFC/NCDS database/ADB</td>
<td>1983-1992</td>
</tr>
<tr>
<td>PI</td>
<td>7</td>
<td>(Unless otherwise specified), Log of ratio of private investment to current GDP</td>
<td>IFC/NCDS database/ADB</td>
<td>1983-1992</td>
</tr>
<tr>
<td>EXPO</td>
<td>7</td>
<td>Log of ratio of total export to current GDP</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
<tr>
<td>OPEN</td>
<td>7</td>
<td>Log of ratio of export plus import to current GDP</td>
<td>WEO/World Bank/ADB/UN</td>
<td>1983-1992</td>
</tr>
</tbody>
</table>

WEO = World Economic Outlook database accessible online: http://www.imf.org/external/pubs/ft/weo/1999/02/data/index.htm
### TABLE 8.2.1: POOLED REGRESSIONS (IN LEVELS): CORRUPTION COMPONENTS

<table>
<thead>
<tr>
<th>1</th>
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<th>9</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(-0.97)</td>
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| **ECSGDP** | -1.0***|        |        |        |        |        |        |        |        |
|            | (-2.74) |        |        |        |        |        |        |        |         |
| **GOVTC**  | -0.089**|        |        |        |        |        |        |        |         |
|            | (-1.985)|        |        |        |        |        |        |        |         |
| **CAPCV**  | -0.07***|        |        |        |        |        |        |        |         |
|            | (-3.381)|        |        |        |        |        |        |        |         |
| **ECONTE** | -0.23***|        |        |        |        |        |        |        |         |
|            | (-6.008)|        |        |        |        |        |        |        |         |
| **DEBT**   | -0.059**|        |        |        |        |        |        |        |         |
|            | (-1.936)|        |        |        |        |        |        |        |         |
| **SUBGDP** | -1.69***|        |        |        |        |        |        |        |         |
|            | (-4.623)|        |        |        |        |        |        |        |         |
| **SUBTE**  | -0.5*** |        |        |        |        |        |        |        |         |
|            | (-4.16) |        |        |        |        |        |        |        |         |
| **OPEN**   | -0.108**|        |        |        |        |        |        |        |         |
|            | (-2.584)|        |        |        |        |        |        |        |         |
| **CIM**    | 0.23*** |        |        |        |        |        |        |        |         |
|            | (6.836) |        |        |        |        |        |        |        |         |
| **FREE**   |        |        |        |        |        |        |        |        | -0.163 |
|            |        |        |        |        |        |        |        |        | (-0.199)|

| **R-SQD** | 0.165 | 0.146 | 0.268 | 0.416  | 0.116  | 0.286  | 0.248  | 0.171  | 0.4635  | 0.088  |
|           | (6.165)| (-0.199)|        |        |        |        |        |        |         |         |
| **F-STAT** | 3.27**| 2.79**| 5.95***| 11.6***| 2.136*| 6.51***| 5.4***| 14.0***| 14.0***| 1.571  |
|           |        |        |        |        |        |        |        |        |         |         |
| **SER**   | 0.730 | 0.724 | 0.730 | 0.729  | 0.721  | 0.708  | 0.713  | 0.715  | 0.726   | 0.721  |

The t-statistics are in parenthesis. (***), (**), and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
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The t-statistics are in parenthesis. (***), (**), and (*) denotes significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
References


IMF Working Paper, WP/00/182, International Monetary Fund.


Unpublished Manuscript, University of California, August.


