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A survey of growth and development issues of the Pacific islands

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Research Paper No. 2007/34

A Survey of Growth and Development Issues of the Pacific Islands

B. Bhaskara Rao, Kanhaiya Lal Sharma,
Rup Singh and Nalini Lata*

June 2007

Abstract

This paper is a survey of some key variables with an international dimension and implications for growth and development policies in selected Pacific island countries. Results from a simple growth accounting exercise show that factor accumulation is the most dominant growth factor and that the contribution of total factor productivity is negligible. Therefore, increasing the investment rate to improve growth rate is a pragmatic medium-term policy option. Further, econometric analysis shows that foreign aid has a negligible effect on output and growth in Fiji, Solomon Islands and Papua New Guinea.

Keywords: macroeconomic analyses, economic growth, development issues, Pacific islands

JEL classification: O11, O40, O56

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Acronyms

APMRN	Asia Pacific Migration Research Network
FDI	foreign direct investment
HIPCs	heavily indebted poor countries
MIRAB	migration, remittances, aid and bureaucracy system
PACER	Pacific Agreement on Closer Economic Relations
PICs	Pacific island countries
PICTA	Pacific Island Countries Trade Agreement
PNG	Papua New Guinea
TFP	total factor productivity

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1 Introduction

The Pacific island countries (PICs) share common problems with many developing countries, but there are some special economic problems that are unique to the PICs. These include diseconomies of scale in production and exchange of goods and services, high vulnerability to natural disasters and remoteness from major ports and export markets. Further, these countries concentrate on the production of a few primary commodities due to narrow resource bases and limited production facilities. The PICs are highly dependent on imports of both intermediate and finished goods, while diversification in exports is limited. Most of the PICs have experienced, on average, low growth in output over the past decade and their growth rates have shown large variations. Trade deficits have been increasing due to declining exports and increasing imports, causing an increase in external debt. Following an integration into the global economy, these now face new challenges due to limited resources, poor management skills and technology. Therefore, aid and migrant remittances have become important to fill the increasing trade deficits. Direct foreign investment (FDI) also plays an important role, especially if such investments reduce imports and increase exports through capacity-building.

In this paper, we first survey some factors that are generally believed to be growth improving and to create an environment for growth. These are foreign aid, foreign direct investment, trade, migration, remittances and external debt. Our sample of countries consists of the Fiji Islands, Papua New Guinea (PNG), Solomon Islands, Samoa, Tonga, and Vanuatu. A growth accounting exercise is conducted to determine the relative importance of factor accumulation versus factor productivity in these PICs which, we believe, has implications for policies based on the aforesaid growth factors. It is observed that growth in these countries is dominated by factor accumulation. Therefore, we conduct a simulation study with the Sato (1963) closed form solution for output in the Solow (1956) model to show that increasing the investment ratio is a pragmatic medium-term growth policy option in countries like Fiji, Solomon Islands and PNG, because its growth effects persist for well over a decade. Finally, some econometric tests on the significance of aid for output and/or growth are conducted on a selective basis due to data limitations and the scope of this paper. Our econometric results show that aggregate aid has either insignificant or negative growth effects in Fiji, Solomon Islands and PNG.

The paper is structured as follows: in section 2, we summarize the basic characteristics and trends in the performance of the selected PICs. Section 3 surveys the key developments in the aforesaid growth factors. Section 4 presents our findings based on the growth accounting exercise. Conclusions and policy recommendations, together with limitations, are in the final section 5. Our sample period for most countries is 1975-2003 and the major sources of data are the *International Financial Statistics* of the International Monetary Fund, World Bank's *World Development Indicators*, the United Nations' and the Asian Development Bank's databases.

2 Performance in the selected PICs

2.1 A brief background of the Pacific islands

The entire group of PICs is spread over 30 million km² of the Pacific Ocean but less than 2 per cent of the land area is inhabited. These islands differ widely in size, population, economic activities and resource endowments. Table 1 shows some of the key indicators. The Melanesian group of countries (namely, Fiji, PNG, Solomon and Vanuatu) are larger in size in comparison to the Polynesians (Cook Islands, Samoa and Tonga), where land sizes vary from 200 km² to 3,000 km². Accordingly, population density is higher in Polynesia which is more urbanized and has a higher literacy rate than the Melanesians. The PICs can be categorized as the middle-income group of countries. Per capita GDP ranges from a low of US\$513 in the Solomon to a high of US\$7,500 in the Cook Islands. However, of the Melanesians, Fiji ranks the highest, at around US\$3,000. Fiji, PNG and Vanuatu have experienced average annual growth rates of 2.6 per cent to 3.6 per cent while the Cook Islands, Samoa and Tonga grew at around 2.5 per cent per annum. However, the Solomon Islands recorded an annual growth of less than 1 per cent due to political upheaval in the 1990s. Nonetheless, these growth rates are less than the average rate of growth of 3.8 per cent achieved by countries in the middle income group. However, the Commonwealth of Australia (2006) report on the Pacific shows that during the years 2002-05, there has been an improvement in the economic performance of the PICs, particularly in Samoa and the Cook Islands.

Table 1
Basic characteristics of Pacific island countries, 2004

Country	Land area (000 km ²)	Population (000)	Population growth (%)	Urban population (% of total)	Literacy rate (% of adult pop)	GDP per capita (US\$)	Growth of per capita GDP (%)
Fiji	18.3	840	1.0	52	93	3098	1.6
PNG	462.2	5800	2.5	13	57	695	1.0
Solomon Islands	28.4	521	2.8	17	30	513	-1.9
Vanuatu	12.2	213	2.7	23	34	1472	0.0
Cook Islands	0.2	20	0.6*	70*	94	7549**	1.8*
Samoa	2.9	181	0.8	22	99	2030	1.6
Tonga	0.6	102	0.4	34	99	2087	2.2
Low income	—	—	2.0	31	61	536	2.6
Middle income	—	—	1.1	53	91	2305	2.7
Upper middle income	—	—	0.9	72	94	5189	1.4

Notes: Growth rates are annual averages and * indicates figures in 2001 and ** in 2003.

Source: Rappaport, Muteba and Therattil (1971) for land area data; all other data obtained from Commonwealth of Australia (2006: 18).

3 Developments in growth factors

In this section, we survey developments in the major growth factors which are thought to have an international dimension.

3.1 Foreign aid

The effectiveness of foreign aid on economic growth is controversial in spite of a large number of empirical studies. White (1992) and Hansen and Tarp (2000) provide good surveys of aid literature and explain the macroeconomic impact of foreign aid. While White (1992) selects dual gap models, Hansen and Tarp (2000) extensively examine the literature based on the controversial findings of Burnside and Dollar (2000).

The World Bank report (1998) concludes that aid is important for two reasons, first that there is a role for financial transfers from the rich to poor countries and second, effective aid supports institutional development and policy reforms. Burnside and Dollar (2000) examine the relationships between foreign aid, economic policies and the rate of per capita output growth using a panel of 56 countries over the period 1970 to 1993. They find that aid has a positive effect on growth in developing countries that have credible macroeconomic and trade policies but has little effect in countries with poor policies. Subsequently Easterly, Levine and Roodman (2003) examine the robustness of the Burnside and Dollar (2000) results with alternative definitions of aid and good policies and with sample period extended to 1996. They find that the Burnside and Dollar conclusion that aid promotes growth in a good policy environment is not robust to the inclusion of new data or alternative definitions of 'aid', 'policy' or 'growth'. However, they emphasize that their findings do not imply that aid is ineffective but that adding additional data to the Burnside and Dollar study raises new doubts about the effectiveness of aid and policymakers should be less optimistic about Burnside-Dollar findings.

Rajan and Subramanian (2005) apply a panel approach and find little evidence between aid and growth. Their findings support the conclusions of Easterly, Levine and Roodman (2003). They further argue that aid does not work in more favourable geographical environments, nor are certain forms of aid better than others. Therefore, they seem to indicate that aid-growth relationship is weak. However, in a recent study, Karras (2006) using annual data from 1960 to 1997 for a sample of 71 aid-receiving developing economies shows that the effect of aid on economic growth is significantly positive and permanent. Similarly, Radelet, Clemens and Bhavnani (2005) examine the aid-growth nexus using aid flows into 67 countries between 1974 and 2001 and conclude that what matters for growth is the type of aid. Their results show that aid for disaster management, emergencies and humanitarian relief efforts, including food, has a negative relationship with growth, while aid for environmental conservation, democratic reforms, strengthening health and education status affects growth positively.¹

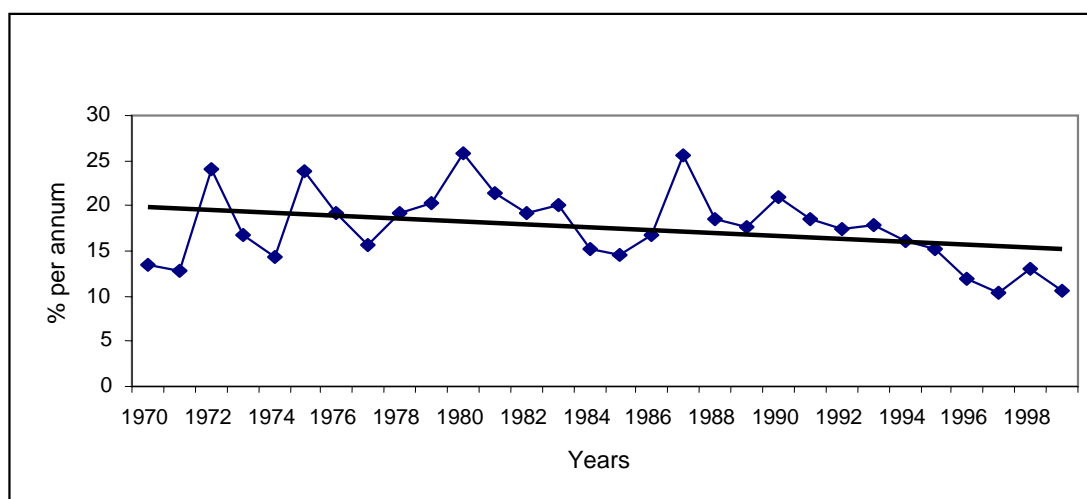
One of the weaknesses in the aforesaid studies based on cross-section data is that they have limitations for country-specific policies. It is also hard to provide any rationale for the numerous specifications used in these empirical works which are essentially based on the reduced form equations. Easterly, Levine and Roodman (2003: 2) observe that: 'This literature has the usual limitations of how to choose the appropriate specification without clear guidance from theory, which often means there are more plausible specifications than there are data points in the sample'.

¹ According to Radelet, Clemens and Bhavnani (2005) aid for building infrastructure (roads, irrigation systems, electricity generators and ports) tends to affect growth rates fairly quickly. They also argue that in countries with better institutions, aid shows a stronger relationship.

There are a limited number of studies available on aid and growth for the PICs. We briefly describe their conclusions here but shall examine the details later in this paper. Gounder (2001) estimates a relationship between the various forms of foreign aid (grant aid, loans and technical cooperation) and economic growth for Fiji for the period 1968 to 1996. She shows that total aid as well as its components has a significant impact on growth in Fiji. Similar observations are made by Jayaraman and Choong (2006) who argue that aid seems to have a significant long-run effect on Fiji's output. However, Feeny (2005) finds little evidence that total aid has contributed to economic growth in PNG although there is weak evidence that project aid has an effect on growth. Rao and Takuria (2006) find that aid seems to have a negative growth effect in Kiribati because (i) aid seems to have created a dependence culture and (ii) aid money is spent mostly on consumption goods which consequently creates little capacity in the economy. Hughes (2003) identifies inappropriate economic policies, aid spending on consumption rather than investment and misused funds, as the main reasons for the failing impact of aid on growth. In light of these observations, it can be concluded that the relationship between aid and growth is controversial and in our view the transmission mechanism of aid seems to be a secondary issue.

The average aid as a proportion of income in our sample of countries is given in Figure 1. Clearly, the aid ratio indicates a downward trend, and over the sample period, the average aid ratio has declined by 0.1 percentage point annually. On average, while it was around 19 per cent until the end of 1980s, it declined sharply to around 15 per cent in the 1990s. This may have some implications for the PICs since they are in their initial stages of development and are mostly fragile economies.²

Figure 1
Aid as a proportion of GNI (sample average)



Source: Authors' computations based on data from the World Development Indicators and the UN website. The linear trend line is plotted using the available data.

² GNI instead of GDP figures are used due to the lack of consistent data on the aid-to-GDP ratio for all the sample countries.

3.2 Foreign direct investment

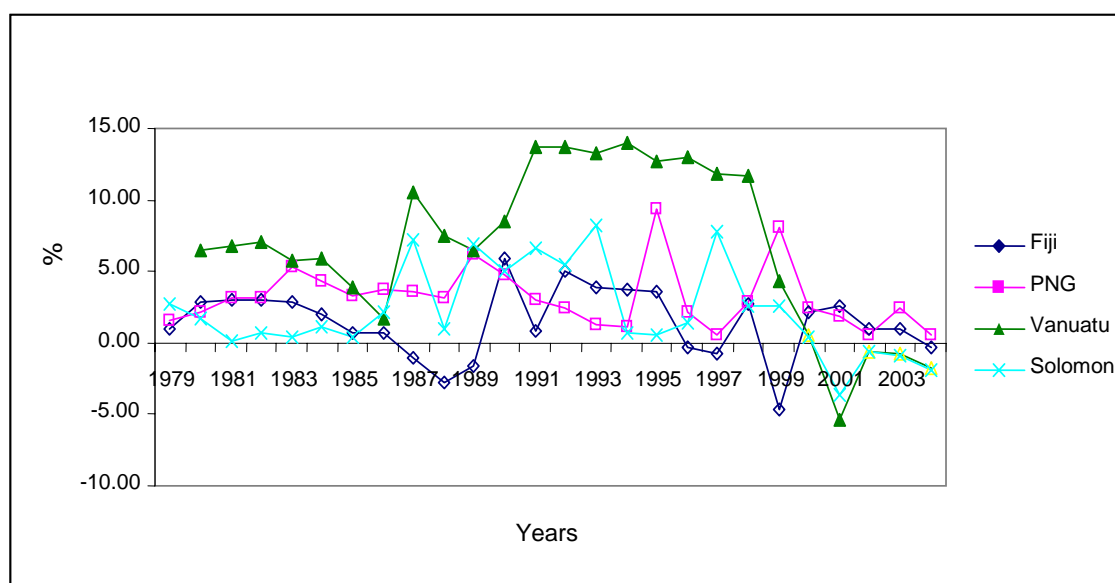
Foreign direct investment (FDI) is considered as a catalyst for growth, capital accumulation and technological progress. De Mello (1997) surveys FDI in developing countries and notes that its effects on output depend on the FDI spillovers, increasing returns and value-addition by the domestic firms. Further, FDI is considered as growth enhancing in the long run through knowledge transfer and improved management skills. In a similar study for the East Asian region, Hill and Athukorala (1998) survey foreign investment focusing on three key issues: (i) impact of the economic crisis of the 1990s; (ii) the links between FDI and trade, and (iii) technology transfer and adaptation. They conclude that FDI continues to play a pivotal role in economic transformation in the region. Schneider and Frey (1985), using a sample of 80 developing countries, conclude that FDI is simultaneously determined by both economic and political factors—the two most important economic factors are the level of development (as measured by per capita real GNP) and the balance of payments. The crucial political variables are foreign aid (bilateral and multilateral) and political instability. Factors like GDP growth, level of worker skills, inflation and wage costs are found to be less important. Parry (1988) examines the role of foreign investment in the South Pacific nations. He argues that FDI has been the main driver in the development of mining, forestry and timber processing, fisheries, tourism, financial and retailing services in the region. Jayaraman (1998) suggests that FDI may be considered as an alternative to foreign aid in the PICs and argues that PICs have already initiated several economic reforms to increase the efficiency of FDI. However, some sensitive issues related to land tenure and property rights are yet to be resolved in order to see the full effect of FDI in these countries.

Gani (1999), using data from 1976 to 1995, examines the contributions of FDI on Fiji's growth rate. His empirical tests show that there is a positive relationship between FDI and growth in Fiji and therefore policies to increase the flow of FDI should be considered seriously. He argues that market size, openness policy and real exchange rate are crucial determinants of FDI inflows into Fiji. Undertaking a study on improving growth prospects in the Pacific, the ADB (1998) finds that the contributing factors for the region's low FDI are: (i) law and order problems, (ii) insecurity of property rights, (iii) highly regulated investment regimes, (iv) high transportation costs and (v) uncompetitive unit labour costs.

Against this background, some important issues in FDI can be noted. These are: (i) FDI does not seem to have a direct link with growth; this actually depends on whether it builds capacity in the receipt economy; (ii) the impact of FDI is realized through an increase in productivity of sectors like agriculture, forestry, fisheries and tourism in the PICs and (iii) FDI flows may remain low in light of the significant hindrances such as law and order problems, insecurity of property rights, lack of infrastructure and high costs of doing business in the PICs.

Due to the unavailability of data for all countries under review, the ratio of FDI to GDP for selected sample counties is shown in Figure 2. The trends indicate that FDI flows have declined sharply in the recent years relative to the late 1980s and 1990s period. On average, it was around 3.5 per cent in the early 1980s, but increased to around 5 per cent in the mid 1980 to the end of 1990s. However, it again declined almost to negligible rates after 2000. In the case of Vanuatu and Solomon, it showed negative rates for this period, indicating a net outflow. Similar observations were made for Fiji following the 1987 political crisis and the devaluation of the currency in 1998.

Figure 2
FDI/GDP ratio



Source: Authors' computations using data from the *World Development Indicators*, ADB (2006a), and the UN website.

3.3 Migration

Studies of the impact of migration on economic growth are limited. However, Moody (2006) argues that migration has a significant impact on labour productivity and utilization, although she does not formally test its effects on growth. The World Bank (2006) indicates that international migration poses both opportunities and challenges and may therefore have either negative or positive effects on growth. It argues that while migrant remittances are generally beneficial, the migration of skill can retard economic and social development in small and isolated countries. Athukorala (2006) examines emerging patterns of labour migration in the East Asian region from the perspective of labour-importing countries. He finds evidence that migration is becoming an important factor in economic growth and the structural transformation of the high performing Asian countries. The study argues that there is a strong case for including migration on the agenda of regional trading agreements or other regional cooperation initiatives in order to devise regional and country specific solutions to political opposition of foreign workers because labour flows impinge much more directly on national sovereignty and identity than foreign trade or investment.

Some specific issues in the PICs can be noted from the limited number of studies that are available. Bertram and Watters (1985) and Bertram (1997) evaluate the emergence of the system of migration, remittances, aid and bureaucracy (MIRAB) in five small PICs, namely, the Cook Islands, Niue, Tokelau, Tuvalu and Kiribati, where remittances are seen as a major source of income. This follows the opening of the New Zealand labour market to some of these countries since the 1950s. Appleyard and Stahl (1995) survey migration in the PICs and note that there has been an increase in the disparity of earnings and employment opportunities in the PICs relative to industrial countries such as New Zealand, the USA and Australia. The authors argue that Australia could assist counties like Tonga, Western Samoa, Kiribati and Tuvalu by granting limited temporary

access to its labour market. Recently, New Zealand has responded favourably to temporary employment in the horticulture sector from some of the PICs.

The Asia Pacific Migration Research Network (APMRN) report (1997) analyses the trends in migration from Fiji and its contributing factors over the period 1962-94. It shows that during the review period, nearly 141,000 people (around 30 per cent of Fiji's population in 1966 or 15 per cent in 2005) had left Fiji mainly for Australia, New Zealand, the USA and Canada.³ It notes that emigrants from Fiji are mostly Indo-Fijians but in the recent years, a noticeable number of indigenous Fijians are also migrating. Factors leading to migration are political uncertainties, lack of security on land issues as well as pull factors such as better education for children and higher incomes and standards of living abroad. Connell (2002) argues that apart from those mentioned in the APMRN report, natural hazards and radical changes in expectations over what constitutes a satisfactory standard of living, a desirable occupation or a suitable mix of accessible services and amenities determine migration from the PICs.

Mohanty (2006) argues that while migration leads to brain-drain and loss of productivity, it also represents an opportunity to ease the pressure of the surplus labour in developing countries. However, he states that while this may reduce unemployment to some extent, it also leads to additional costs in terms of training and replacing the loss of skilled labour. He labels Kiribati and Tuvalu as the few countries in the world where local population is trained for working overseas, especially in New Zealand. Firth (2005) states that while migration is significant in Fiji, it is low in Papua New Guinea, Solomon Islands and Vanuatu because the standards of education and skills required by recipient countries are not adequately matched by migrants from these countries. He notes, however, that there is significant inter-island migration as well.

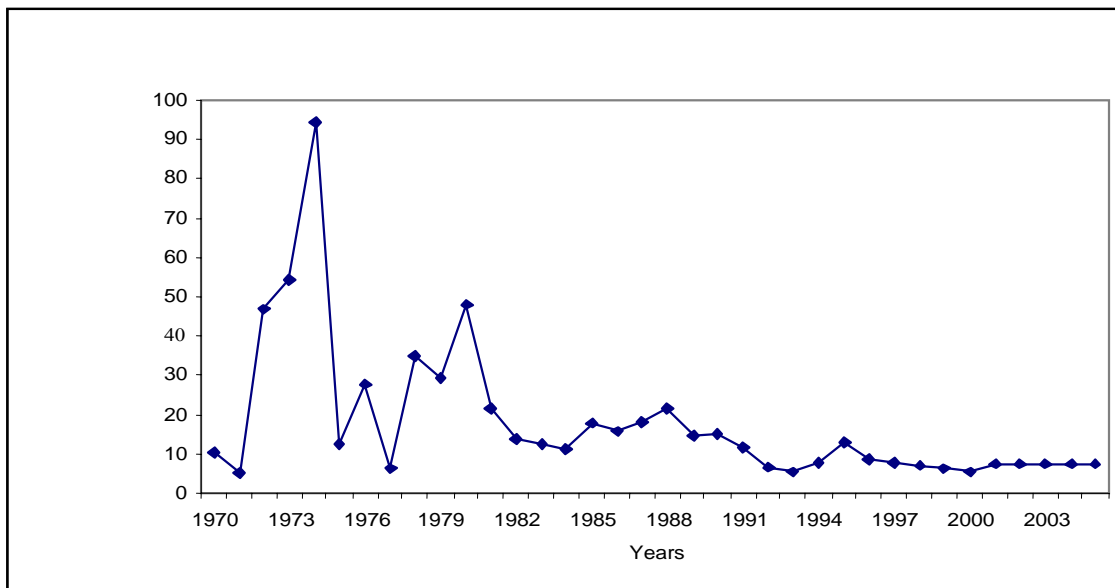
Some important issues pertaining to migration from the PICs can be noted:

- i) The persistent pull and push factors that drive migration are political problems, higher earning opportunities, better standards of living and education in the destination countries.
- ii) Migration benefits the counties through remittances and absorption of excess labour; and
- iii) Migration tends to be harmful especially in smaller countries because it is difficult to replace human capital.

Thus in general, we can say that migration is seen as a hindrance to growth in the countries of origin. Figure 3 shows the trends in net migration from four PICs. It may be noted that migration has declined sharply since the early 1970s, when in 1974 it reached a record high at around 100 per 1,000 people, after which it started its downward trend. Although there was another peak in 1980, it has declined by around 0.16 per cent per annum since then. However, in the recent years, net average migration seems to have stabilized.

³ According to Firth (2005), most of the migrants left Fiji following the 1987 political crisis. Tapuaiga and Chand (2004) argue that Fiji lost one-fifth of its labourforce over the period 1990-99. Tonga, Cook Islands and Samoa had also experienced massive migration in the 1990s.

Figure 3
Average migration



Notes: Data for Fiji, Cook Islands, Tonga and Samoa are available but for different time intervals. Therefore, the above graph represents average figures for these four countries. Migration is measured as per 1,000 population using data from the *World Development Indicators* and the UN website.

3.4 Remittances

Remittances are flow of incomes from migrants to families back home. Generally, it is agreed that these remittances help reduce poverty in the income-recipient countries. The officially recorded remittances received by developing countries in 2003 amounted to US\$93 billion, second to the FDI which was close to US\$133 billion.⁴ Studies indicate that there seems to be a weak positive relationship between remittances and economic growth. This is because, generally, remittances tend to be used for consumption and to some extent for investment, see Hertlein and Vadean (2006). Solimano (2004) states that remittances bring foreign exchange and can provide finance for capital formation to support growth in the recipient countries (also see Ratha 2004). In a report on Bangladesh, the ADB (2006a) observes that following an increase in remittances, there was a turnaround in the current account balance from a deficit in 2005 to surplus in 2006.

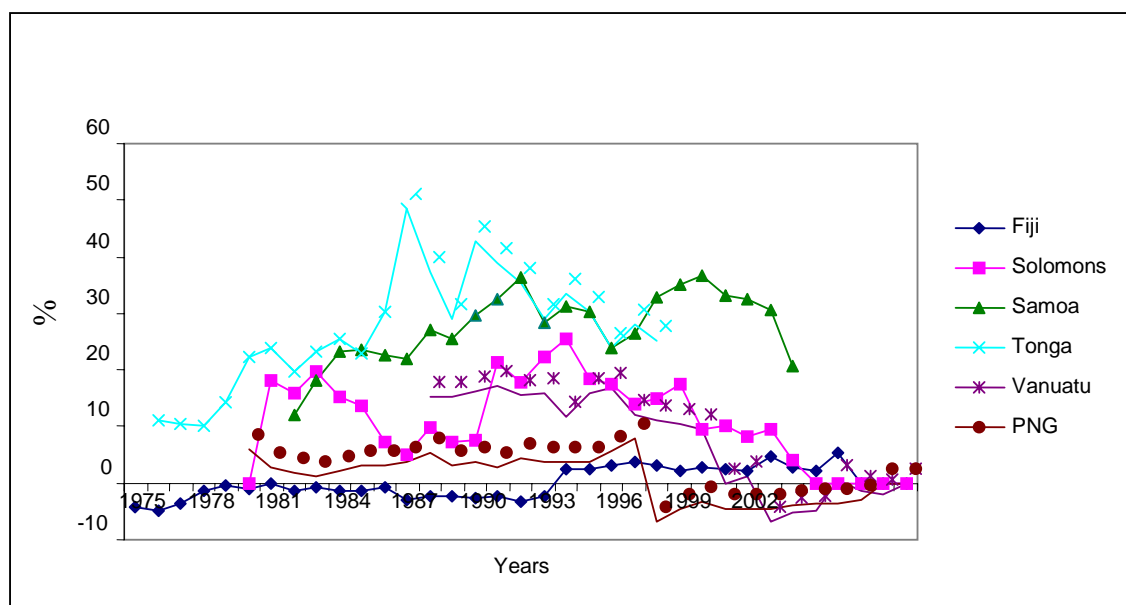
Studies on the PICs highlight a mixed importance of remittance. Bertram and Watters (1985) find that the impact of remittances is small on the average per capita incomes. However, in its recent assessment of the Fiji economy, ADB (2005) argues that activity in Fiji is mostly stimulated by private consumption which in turn is underpinned by private remittance inflows. This effect, however, may be short-lived as Fraenkel (2006) finds evidence of ‘remittance decay’ in Tonga, Samoa, Marshalls and in the Cook Islands. In addition to these inconclusive findings, there are some problems in recording remittance data as well. Brown (1995) suggests that remittances can be classified as official and unofficial transfers and there are reasons why estimates of remittances tend

⁴ Ratha’s (2004) observation, based on Solimano (2004), is that in per capita terms, developing countries received 65 per cent of the world’s remittances in 2001.

to be both inaccurate and inconsistent. He argues that these anomalies are due to definition problems,⁵ noting that remittances are a major source of foreign exchange and incomes for households in the PICs. He argues that remittances are greater for Tonga and Western Samoa than their total export earnings. In these economies, domestic consumption expenditure is significantly greater than GDP, hence a negative domestic savings rate. However, savings tends to be positive and the savings-investment gap appears much smaller when GNP figures are considered. This is possibly due to large amount of remittances inflow. His survey of Tonga also reveals that a significant part of remittances is used for investment purposes, such as housing or in agriculture. Moreover, remittances in kind are usually found to be in the form of investment goods including building materials, light machinery and vehicles. However, for the PICs as a whole, remittances make only a scant contribution to savings and investment because they are primarily a source for immediate consumption. As Connell and Brown (2005) point out, remittances are mainly used to purchase food items, goods such as outboard motors, housing, airfares, education and even investment in some of the PICs.

In a recent article, Brown and Connell (2006) survey the migration status of doctors and nurses from Fiji, Tonga and Samoa and show that overall, remittance levels appear to be higher among these households. However, they observe that the propensity to remit tends to decline faster in the medical professionals compared to other remitters. Taomia (2006), in examining the impact of remittance on the development of Tuvalu, argues that remittances together with foreign aid have been useful in maintaining the balance of payments. He finds that both GDP and remittances follow similar increasing trends and thus concludes that remittances have an effect on Tuvalu's economy. Therefore, migration and remittances are considered to be vital elements of Tuvalu's development.

Figure 4
Ratio of remittances to GDP



Source: Authors' calculations based on data from ADB (2006a) and the UN website.

⁵ The UN (2005) report also observes that there is no international framework for collecting data on remittances from household surveys. Therefore, the concepts and methodologies applied to data are not uniform across all countries.

Some issues arising from the above survey are noteworthy:

- While remittances are one important advantage of migration, it seems that they create inefficiencies and dependence in most island economies. Further, remittances have also been seen as a disincentive to work, leading to low productivity.
- While the effects of remittances on economic growth and other variables are difficult to test formally, obtaining reliable data on remittances is a problem.

The flows of remittances as a proportion to GDP in our sample of the PICs are given in Figure 4. As can be seen, while the ratio of remittances to GDP is high in Tonga and Samoa, it is low in the others, especially in Fiji and PNG. In all countries, excluding Samoa, remittances have declined since 1995 by about 1.3 per cent per annum. In the recent years, on average, remittances as a ratio of GDP are fairly low.

3.5 External debt

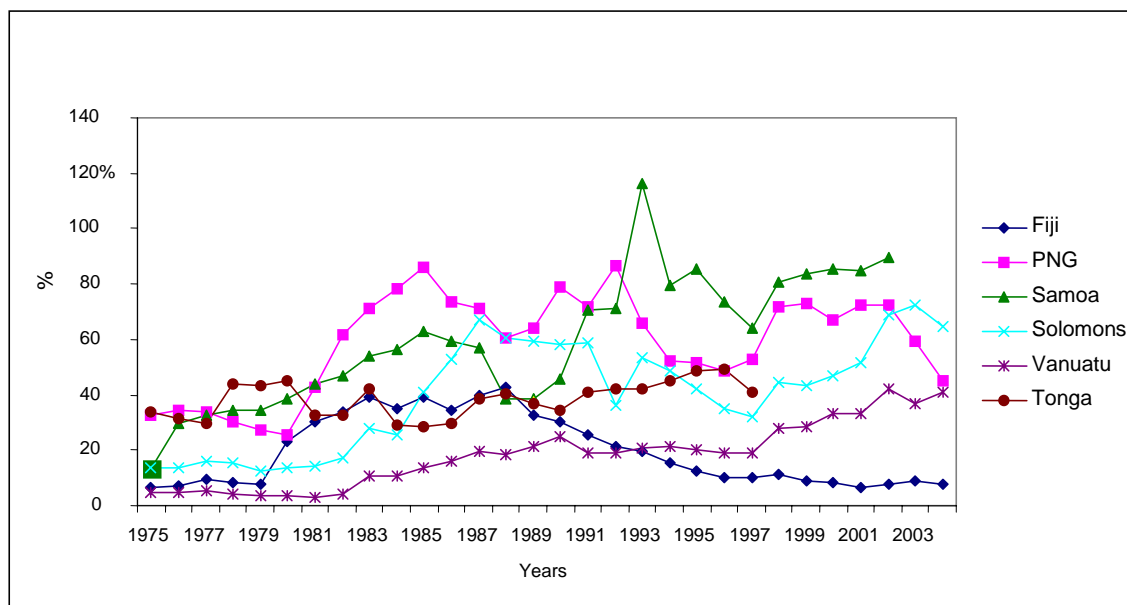
It is well-known that excessive indebtedness tends to be a major impediment to economic growth and stability in developing countries. Sachs (1998) analyses economic growth in countries classified by the World Bank as those suffering from debt service difficulties and notes that they have fallen far short of the growth in countries without debt service problems. According to the World Bank (2001), high levels of external debt are increasingly recognized as a serious constraint on the ability of poor countries in pursuing sustainable development and reducing poverty.

Presbitero (2005) applies an econometric analysis for 152 developing countries over the period of 1977 to 2002 and finds a negative relationship between external debt and economic growth as well as debt service and investment. The effects are also noted to be stronger in the low-income countries. He concludes that for these countries, a debt reduction from a debt-to-exports ratio of 200 to 150 adds more than 1 per cent to the growth rate of per capita outputs in the heavily indebted poor countries (HIPCs). Further, according to Presbitero, a reduction in the debt service ratio can be twice as effective as an equal increase in foreign aid. Clements, Bhattacharya and Ngu Yen (2005), using data for the period 1977-99 for 55 low-income countries, attempt to determine whether debt relief can boost growth in poor countries. They note that while high levels of debt can depress economic growth in these countries, external debt slows growth only after its face value reaches a threshold level estimated to be around 50 per cent of GDP or net present value of 20-25 per cent of GDP. They claim that a substantial reduction in external debt projected for HIPCs can directly add 0.8 per cent to 1.1 per cent to their per capita growth rates. They also find that external debt affects growth indirectly through its impact on public investment resulting from the cost of debt serving. Their results indicate that on average, a 1 per cent debt-service increase as a share of GDP reduces public investment by about 2 per cent. Schclarek (2004) explores the relationship between debt and growth for 59 developing and 24 industrial countries. The results show a negative and significant relationship between total external debt and economic growth for developing countries. For industrial countries, high debt levels are not necessarily associated with lower GDP growth rates.

Unfortunately, studies on external debt and growth focussing on the PICs are unavailable to us for review. However, from our survey above, we can conclude that

(i) there exists a negative and significant relationship between foreign debt and economic growth and (ii) that debt service reduces the availability of funds for public investment, hence indirectly affects growth. Debt ratios of the selected PICs are given in Figure 5 and it can be seen that in general, debt ratios have increased by twofold since 1975. It was significantly high in Samoa in 1992 but has declined since then. A notable trend is found in Fiji where the debt ratio was 5 per cent of GDP in the 1970s, but increased to around 38 per cent in the 1980s. However, since 1987, it has been declining by around 1.4 percentage points annually.

Figure 5
Debt ratio



Source: Authors' calculations based on data from the *World Development Indicators*.

3.6 Trade

Until the 1970s, import substitution and industrialization strategies were dominant in developing countries. However, since the late 1980s and 1990s, trade liberalization or outward orientation has been advocated as the engine of growth and development. The links between trade and growth have been the subject of many empirical studies. Michalopoulos and Jay (1973) use the aggregate production function approach for 39 countries, together with exports as an auxiliary variable and find that GNP growth was significantly correlated to the growth rate of exports. Similar observations are made by Michaely (1977) for 41 countries over the period 1950-73. Saggi (2002) surveys the recent trade literature on international technology transfers, paying particular attention to the role of FDI and argues that trade encourages growth only if knowledge spillovers are international in scope. However, empirical evidence on the scope of knowledge spillovers (national versus international) is ambiguous.

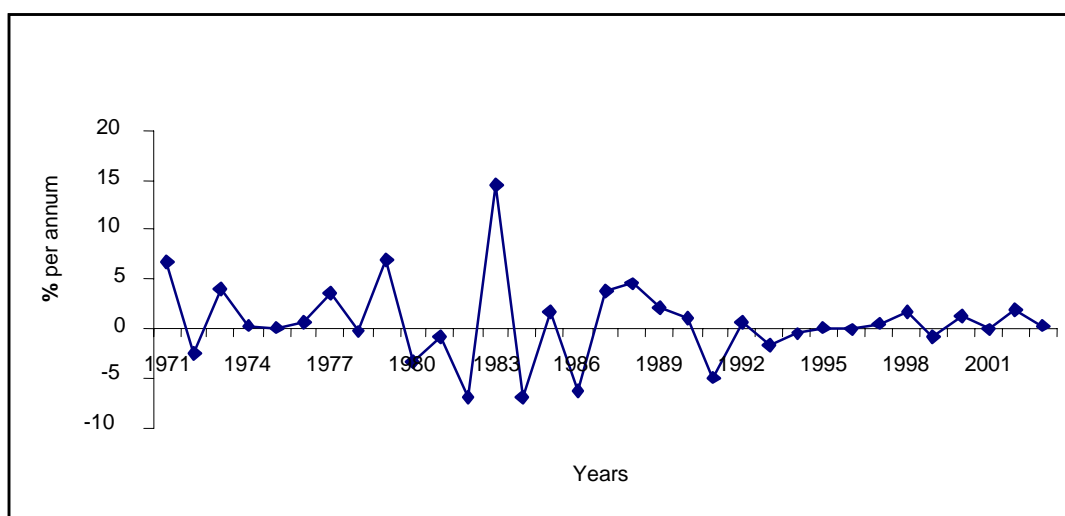
Frankel and Romer (1999) examine the correlation between trade and income but cannot identify the direction of causation between the two, as trade volumes are not determined exogenously. As a result, the correlation between trade and income cannot identify the effect of trade. The paper addresses this problem by focusing on the component of trade that is due to geographical factors. The results are consistent across

the samples and specifications, to confirm that a rise of 1 percentage point in the ratio of trade to GDP increases income per person by at least half a per cent. This is due to the accumulation of physical and human capital, and by increasing output for given levels of capital. The results also suggest that within-country trade raises income. There are two important caveats to these conclusions. First, the effects are not estimated with great precision and second, they cannot be applied without qualification to the effects of trade policies.

Baldwin (2003) surveys the relationship between openness and growth, highlighting an important study by Rodriguez and Rodrik (2001). Their study criticizes the conclusions of a number of multi-country statistical studies that openness is associated with higher growth rates. Rodriguez and Rodrik conclude that openness simply in the sense of liberal trade policies do not guarantee faster growth. Baldwin argues that a key reason for the disagreement among economists seems to relate to differences in what is meant by the concept of openness. Harrison (1996) uses a variety of openness measures to test the association between openness and growth. Although the correlation across different types of openness is not strong, there is generally a positive association between growth and different measures of openness.

During the past ten years, the PICs have also adopted trade liberalization policies as the appropriate strategy for economic growth. Most of them are now signatories to several overlapping regional and international agreements, encompassing trade, aid and investment. These agreements are seen as instruments for accelerating their economic development, create employment, increase incomes as well as the standard of living (Narsey 2004). The regional trade agreements are: the Pacific Island Countries Trade Agreement (PICTA), the Pacific Agreement on Closer Economic Relations (PACER), which includes Australia and New Zealand. The trade aspects of Cotonou Agreement are in the process of being negotiated with the European Union, in the form of economic partnership agreements which are expected to come into effect after 2007. Narsey expresses his concerns about the liberalization of trade within the Pacific countries, as well as for what he terms the 'weak bargaining positions' of PICs. He adds that the monopolies (rather than consumers) will be the main beneficiaries of trade liberalization. According to Narsey, Pacific governments had not analysed the long-term viability of industries affected by PICTA and had not really examined the implications of PACER and WTO compliance and how these would affect Pacific communities. Prasad (2002) points out that trade liberalization must accompany other reforms so that the benefits of trade liberalization are not lost in the process. He adds that the constraints for most of the Pacific Islands are institutional such as uncertainty of land rights, lack of good governance, lack of infrastructure, lack of appropriate legislation and efficient judicial system. Tapuaiga and Chand (2004) explain that in the short term, there are likely to be some adverse effects from liberalization created in the process of reallocating of resources from less productive to more productive sectors in the PICs. These are likely to be in the form of dismantling of some industries, job losses and loss of tariff revenue. They argue that PICs have the potential to promote industries such as ICT where geographical barrier is not a disadvantage. The average growth in trade ratios (ratio of the sum of exports and imports to GDP) of our sample of PICs is given in Figure 6. While trade picked up sharply in 1983, it has been quite volatile until 1987. Since then, there has been a slow growth in trade in the PICs averaging less than 1 per cent per annum.

Figure 6
Growth in trade



Source: Authors' calculations using data from *International Financial Statistics* and the World Bank database.

4 Empirical findings

4.1 Introduction

Country-specific econometric studies on the determinants of growth with implications for policy are relatively few or nonexistent for many PICs. The few studies that do exist for PNG and Fiji seem to have several limitations and are in need of further attention. In this section, we shall use a methodological approach which we believe is useful for formulating policies to improve the growth rate of the PICs. From a policy perspective we think that it is desirable to distinguish between factors that have only level effects from those with permanent growth effects. In between these two, there are factors (e.g., investment ratio), which have not only permanent level effect but also growth effects for a number of periods.⁶ However, depending on whether the endogenous or exogenous growth model is used, their effects may differ. Variables like the investment ratio will have permanent growth effects in the endogenous growth models but such effects eventually converge to zero in the exogenous growth models. The balance of evidence with timeseries data seems to favour the exogenous growth models; see Jones (1995). The aforesaid threefold distinction is especially useful for formulating policies for growth in the PICs and similar countries where nearly 100 per cent of output growth is due to factor accumulation. In such countries, it is difficult to implement institutional reforms fairly quickly for improving their long-run growth rates. In contrast some policies, like improvements in health, education, investment and export ratios, seem to be relatively less difficult to implement. Although their growth effects seem to be small, these effects can be quickly realized.

⁶ Some factors, like capital per worker, generally have both long-run permanent level effects as well as short-run growth effects. The latter effects can last only few years while the long-run growth effects of investment seem to spread over a number of decades.

In what follows we first perform a standard growth accounting exercise to understand the relative importance of factor accumulation and technical progress for the growth rate of output. This is useful for selecting appropriate growth policies from available options and also for identifying policies that need attention by the international agencies and aid-giving countries.⁷ For example, if about 90 per cent of growth is due to factor accumulation and policymakers target higher growth rates, say for the next 5 or 10 years, perhaps it is pragmatic to improve the investment ratio rather than contemplate institutional reforms which need considerable political will to implement and may take over a decade to produce any significant effects. This does not mean that such reforms should be postponed. Policymakers should consider policies that have a quick effect on growth as well as those that are difficult to implement immediately and need longer periods to have significant effects. The fact that growth rates can be improved in the short and medium terms may induce the PICs to become more interested in institutional reforms in an improved economic environment. Therefore, we take the view that in the developing countries—and especially in the PICs—policies that have quick growth effects deserve attention. The growth accounting exercise will give some insights into such policy choices.

4.2 Growth accounting

We now conduct a standard growth accounting exercise for each of the six countries with the stylized values for the factor shares of 0.3 for capital and 0.7 for labour. The capital stock series are estimated with the perpetual inventory method, with the assumption that the depreciation rate is 4 per cent and the initial stock of capital is 1.25 times the level of GDP. The results of our growth accounting exercise are summarized in Table 2.⁸ Except in Fiji where total factor productivity (TFP) growth is positive and small, the entire growth in output in the other countries seems to be due to factor accumulation.⁹ The average growth rate in Fiji is about 2.3 per cent and in Solomon Islands it is 1 per cent higher. However, the coefficients of variation indicate that fluctuations in the growth rates in all the island countries are much higher than in Fiji. Such large fluctuations indicate predominance of the primary sector in the economy and

⁷ Hoover and Perez (2004) note that there are more than 80 such potential growth factors which have been used in various studies with cross-section data. However, for country-specific timeseries studies, such growth factors may be limited because of the lack of data on most of these variables. Furthermore, it is difficult to get any meaningful results on the effects of even a few growth factors when data are available on an annual basis for 30 or 40 years because of co-linearity between these variables.

⁸ An alternative to the growth accounting exercise is to estimate a standard Cobb-Douglas production function based on the standard assumptions that there are constant returns, technology is Hicks neutral and the stock of knowledge grows over time at a constant rate. This method of getting an insight into the issues is a stochastic approach to the standard non-stochastic growth accounting exercise.

⁹ These findings are not surprising. Young (1995), for example, finds that much of the growth in the East Asian economies was due to factor accumulation. Factor accumulation during 1966-90 contributed 105 per cent to growth in Singapore, 88 per cent in South Korea, 80 per cent in Taiwan and 70 per cent in Hong Kong.

various large and significant positive and negative shocks. In this respect, Fiji seems to have coped with various shocks better than the other countries.¹⁰

Nevertheless, it is possible to improve the growth rates in the medium term of 5 to 10 years and in the long run of over 10 years and beyond. For example, Fiji is already targeting a 5 per cent growth rate by improving the investment ratio from about 15 per cent to 25 per cent over the next few years. The targeted investment ratio for 2007 is 18 per cent. Given the above growth accounting results that factor accumulation has contributed 95 per cent to Fiji's growth rate, improving investment ratio to achieve a higher growth rate seems to be a pragmatic medium-term policy option. Similar observations are valid for Solomon Islands where 100 per cent of the growth rate is due to factor accumulation. Export promotion policies may help to improve growth rates over shorter periods, but they are unlikely to have large permanent growth effects in countries where the backward and forward linkage effects are small.

Table 2
Growth accounting, 1972-2003/4

Country	Average rate of growth of GDP	Coefficient of variation	Growth due to factor accumulation	TFP	Investment ratio (1999-2003)
PNG	0.010	5.314	0.010 (100%)	0.000 (0%)	0.17
Fiji	0.023	0.343	0.022 (95%)	0.001 (5%)	0.13
Solomon Islands	0.033*	1.060	0.034 (100%)	-0.001 (0%)	0.19
Samoa	0.010	4.109	0.010 (103%)	-0.000 (-3%)	0.40
Tonga	0.054	9.340	0.035 (98%)	0.035 (2%)	0.21
Vanuatu	0.010	5.970	0.011 (104%)	-0.042 (-4%)	0.30

Note: * Although the mean growth rate for the Solomon Islands from 1970 to 2003 was positive and high, from 1995 to 2003 this was -0.014.

4.3 Some dynamic simulations

We now perform simulations with the Sato (1963) closed form solution for output in the Solow (1956) model. This is useful for understanding how the dynamic effects of improved investment ratios would evolve and how long these growth effects can be sustained. The Sato closed form solution for output is given as follows:

¹⁰ A better estimate of such random shocks can be made by estimating the production functions mentioned in the earlier footnote. No doubt, a part of these large variations in the growth rate of output may be due to missing variables and structural breaks in the data, etc. Nevertheless, we expect that the standard errors of these regression equations will be relatively large, even after allowing for missing variables and structural breaks, indicating that the effects of random shocks on the growth rate (or level of output) in these island countries are large.

$$Y_t = A_0 e^{g t} L_0 e^{n t} \left[\frac{s}{n + g + \sigma} (1 - e^{-(1-\lambda)t}) + \left(\frac{Y_0}{A_0} \right)^{[(1-\alpha)/\alpha]} e^{-\lambda t} \right]^{\frac{\alpha}{1-\alpha}}$$

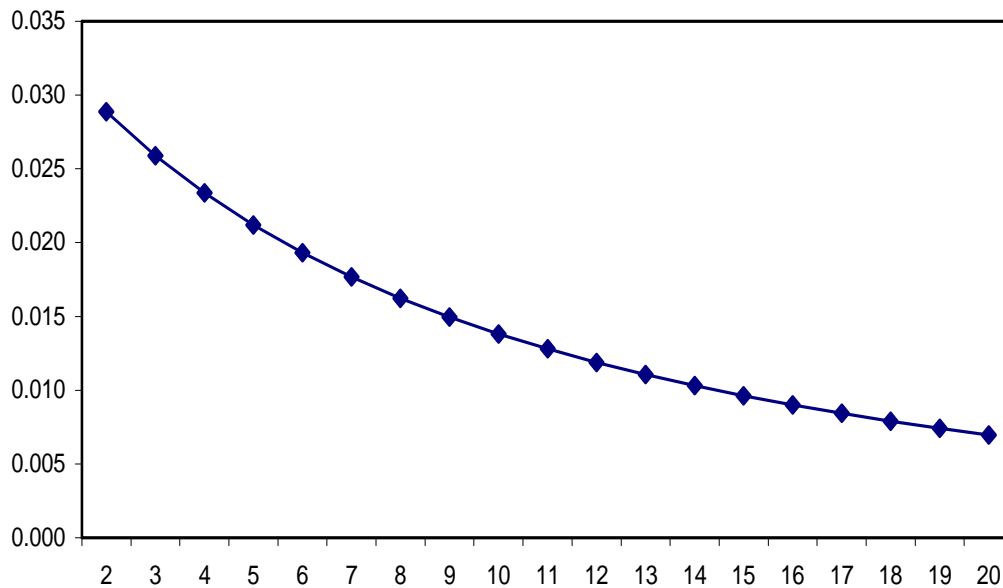
where Y is output, s is investment ratio, A_0 is the stock of knowledge at the beginning of the period, L_0 is employment at the beginning of the period, α is the exponent of capital in the standard Cobb-Douglas production function with constant returns and Hicks neutral technology, $\lambda = (1-\alpha)(n + g + \delta)$, n is the growth of employment, g is the growth rate of technical progress, δ is the rate of depreciation of capital and $t = 0 \cdots T$ is time.

Although this equation looks formidable, the effects of an increase in the investment ratio (s) on the growth rate of output can be simulated with Excel or a symbolic mathematics programme like Maple or Mathematica. The initial stock of knowledge (A_0), labour (L_0) and output (Y_0) are set to unity because our objective is to compute the effects of a change in the investment ratio on the growth rate of output. The share of profits (α) is assumed to be 0.3, the rate of technical progress (g) is set at a slightly higher value of 0.01 and the rate of growth of employment (n) is assumed to be 0.024. These values imply that in the initial period ($t=0$), output in equation (2) is unity, which is the assumed value.

These assumptions about the parameters and variables are close to their values in Fiji although the value for g is set higher at 1 per cent. This latter assumption is not important for the simulation results and only implies a higher steady state growth at 2.5 per cent and in per worker terms growth rate of 1 per cent. No matter what value the investment ratio takes, it does not have any effect on these steady state growth rates. Higher investment rates have significant growth effects only during the transition period of the economy from one steady state to another. It is these transition effects we are interested in because this transition period seems to be pretty long in the calendar terms.

Figure 7 shows the additional growth effects (in excess of the assumed 2.5 per cent equilibrium rate) of an increase in the investment ratio by 3 per cent from 15 per cent to

Figure 7
Growth effects of $s = 0.18$



Source: Based on simulations performed in Maple.

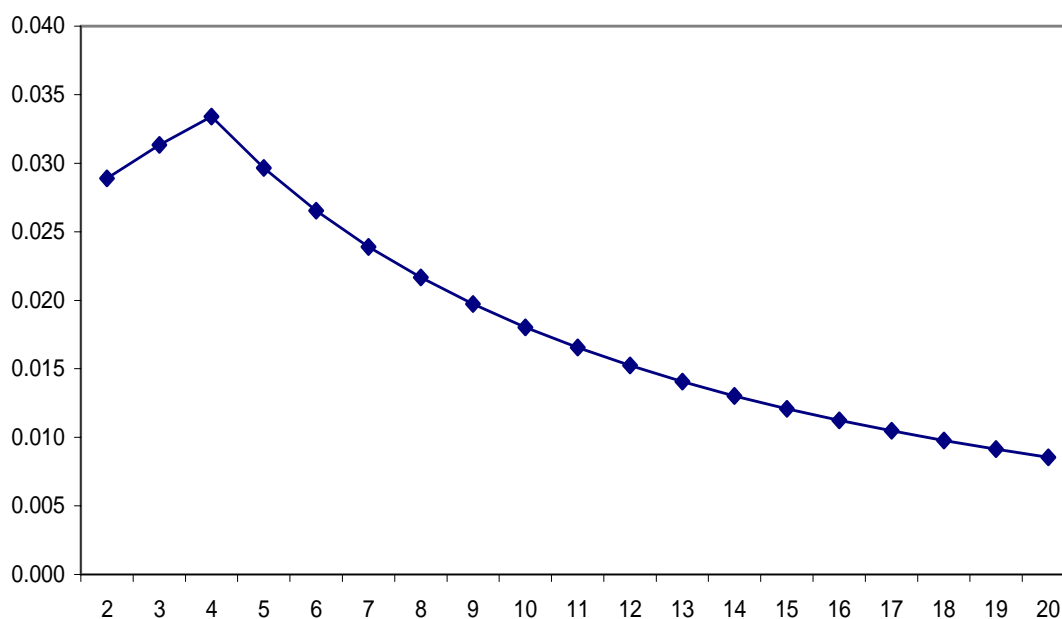
18 per cent for periods 2 to 20. It is assumed that the 18 per cent investment rate is sustained during these years. The average additional growth effect of the 3 per cent increase in the investment ratio in the first five periods is 2.4 per cent, implying that the actual average rate of growth of total output would be almost 5 per cent. These additional growth effects are significantly more than zero even after 20 periods. The average additional growth effect over 15 periods is 1.64 per cent.

Figure 8 shows the additional growth effects of increasing the investment ratio, from 15 per cent to 18 per cent in the first year, then to 21 per cent in the second year and finally to 25 per cent in the third year. The average additional growth rate in the first five periods is almost 3 per cent, raising the actual growth rate of output to 5.5 per cent. Even after 15 periods, the average additional growth rate is 2.5 per cent.

These simulation results imply that many developing countries, including the PICs, can increase their growth rates for substantial periods of 10-15 years by increasing the investment ratio. However, this does not mean that there is no need to implement policies to raise their long-term growth rates through institutional reforms, learning by doing, human capital formation, improved health, greater openness and a myriad of growth improving factors which are identified as growth enhancing variables in the endogenous growth models. According to our understanding, it takes time and political will to implement some of these policies. However, raising the investment rate is relatively easy and therefore seems to be a pragmatic medium-term policy option. Countries where this is a useful medium-term option include Fiji, Solomon Islands and PNG. In the other four countries, where investment ratio is already high, there is some scope in Tonga to further increase the investment ratio by 3 or 4 percentage points.

Some standard policy measures for increasing the investment rate include tax concessions such as tax holidays, especially for the export oriented industries, double

Figure 8
Staggered increase in s



Source: Based on simulations performed in Maple.

depreciation allowances and low interest rate on loans for rural investments. Such policy measures have been successfully implemented in countries such as India. However, given the special problems of the PICs, e.g., law and order problems, small internal markets, remote location and lack of satisfactory property rights, infrastructure and management skills, etc., it is necessary to consider how investment, especially FDI, can be increased. Tax concessions and low interest rate loans may be effective in the PICs with larger populations and diverse resources like the PNG and Fiji. However, increasing investment rates in the smaller countries needs special attention to identify the industries in which they have significant relative cost advantages. For example while it may not be feasible to establish firms to assemble consumer electronic goods in Kiribati, it may be advantageous to establish small- to medium-sized units to process fish products and more efficient plants to extract coconut oil. Therefore, we take the view that it is important to give attention to the identification of industries in which PICs have comparative cost advantage.

4.4 Further policy implications

We note that the impacts of an increased investment ratio on the rate of output growth are substantial and last over a decade. Against this backdrop, it would be useful to examine the growth effects of a few other factors, e.g., overseas development aid, FDI, trade, foreign debt, remittances and migration. We have already reviewed trends in these variables. Some important issues worthy of further investigation are:

- Through what channels do these factors impinge on the growth rate or the level of output?
- Are their effects transitory or permanent?
- If they have only transitory effects, how long do they last?, and
- Do some of these variables, e.g., aid, have only negligible or even negative growth effects?¹¹

The answers to all these questions are difficult without the use of proper econometric techniques, a task beyond the scope of this paper.

However, we shall briefly review the available empirical works on the effects of aid on the growth of PICs. In a comprehensive study using the bounds test approach, with several exogenous variables and proxies for policy environment but without an aid-policy interactive term, Fenny (2005) finds that aid does not have a significant growth effect in PNG. However, he notes that project aid is effective and its coefficient of about 1.3 is significant at the 10 per cent level. Rao and Takuria (2006) use a modified Solow (1956) output equation and observe that aid actually has a negative growth effect in Kiribati. In contrast, Jayaraman and Choong (2006), using a variant of the Burnside-Dollar specification and an aid-policy interactive term, note that aid has a positive effect on the growth rate in Fiji but this is subject to diminishing returns. The main weakness in their work, as observed in Rao and Takuria (2006), is that because of an algebraic

¹¹ That aid has been counterproductive in the PICs is very convincingly argued by Hughes (2003). There is now some empirical support for her observations.

error they find that a 1 per cent increase in aid causes growth to increase by 300 per cent. Needless to say, this is implausible.

Grounder (2001) estimates an aid-growth relationship for the period 1968 to 1996 using the autoregressive distributed lag (ARDL) approach. Although she uses the Solow (1956) model and shows some awareness that the estimated equation is a production function, she adds a number of other variables, following Khan and Reinhart (1990), by treating them as shift variables. Furthermore, in spite of her elaborate attempt, there seems to be some confusion on the derivation of her long-run determinants of growth because in the Solow model the only long-run determinant of the growth rate of per worker income is the growth rate of technical progress. It is also not clear how her error correction term (ECM) is specified and estimated because no details are given. In spite of these limitations, her results show that aid in total, as well as in its various forms, has a significant impact on the growth rate in Fiji. Because of the aforesaid weaknesses, it is difficult to accept her findings on the effects of aid on growth.

In another interesting but a critical analytical study, Hughes (2003) argues that the main reasons for the failure of aid to improve growth are inappropriate economic policies, misallocation (aid used for consumption rather than investment in infrastructure) and other misuse of funds. Subsequent empirical work by Fenny (2005) and Rao and Takuria (2006), which are more systematic, support Hughes' conclusions.

The conclusion we may draw from this brief review is that there is no evidence to support the assumption that aid has any significant effects on the levels or the rate of growth rates of output in the PICs. However, FDI, trade, foreign debt, remittances and migration may have some short-run effects on the growth rates, when they promote an increase in the investment ratios. Further work is necessary to determine the significance of these effects.

5 Summary and conclusion

In this paper, we have surveyed the major variables affecting output and growth rates in selected PICs and note that aid does not seem to have any significant effect on output and growth. We find that FDI may not have a direct link with growth unless it actually builds capacity in the recipient economy. Second, the impact of FDI in the PICs is more profound in some sectors, but FDI flows may remain low in view of the PICs' law and order problems, insecurity of property rights, lack of infrastructure and high business costs. On the part of migration, we note that the factors that drive migration are partly due to political problems as well as higher earning opportunities and better standards of living and education in the destination countries. Further, migration is beneficial to the PICs through remittances and absorption of excess labour, but tends to be harmful especially in the smaller countries where it is difficult to replace human capital. We also find that remittances seem to create inefficiencies, a dependence culture and disincentive to work, leading in the PICs to low productivity. Further, obtaining reliable data on remittances is a problem. We also note that a negative relationship seems to exist between foreign debt and economic growth, and issues of trade arrangement and the bargaining powers of the PICs are important. From our empirical investigations, we can say that factor accumulation is the most dominant growth factor in these countries and that the contribution of total factor productivity is small. Overseas development aid

has a negligible or a negative growth effect in Fiji, Solomon Islands and Papua New Guinea. Finally, we cannot claim that our conclusions are definitive because of data limitations and because our survey of a limited number of quantitative and regression results on the effects of aid on output and growth indicated that they have some drawbacks. Nevertheless, we hope that our paper has provided a few useful methodological guidelines for further work on the growth of the PICs.

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