ECONOMIC GROWTH IN A VULNERABLE ISLAND NATION: AN EMPIRICAL STUDY OF THE AID-GROWTH NEXUS IN VANUATU

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Among all the island countries of the world, Vanuatu, a small island nation in the South Pacific with a population of 220,000 was once ranked as the most vulnerable economy on the basis of having the least resilience to withstand the adverse impacts of external and internal shocks. Vanuatu is currently designated, on the basis of quality of life, as one of the five least developed countries among the Pacific island countries, the other four being Kiribati, Samoa, the Solomon Islands and Tuvalu. Recognizing its special circumstances, including its high dependency on strategic imports with unstable export earnings, proneness to natural disasters and inadequate human resource skills, the international community has been assisting the country with generous external aid ever since its independence in 1980. Bilateral development assistance comes especially from the two regional powers. But, in terms of pure grants given on an annual basis, multilateral funding agencies, including the Asian Development Bank, have been assisting the country with concessional loans for projects and reform programmes. Despite these annual aid inflows, Vanuatu has been performing poorly which is reflected in the stagnation of its per capita income. This article seeks to examine the nexus between aid and growth in Vanuatu and investigates causes behind the country's weak performance. Based on the analysis, the article then makes recommendations with some implications for policy.

Keyword(s): *Pacific Islands, Vanuatu, foreign aid, growth, cointegration, error correction model.*

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I. INTRODUCTION

Vanuatu, formerly known as the New Hebrides, is one of the youngest independent countries in the Pacific region, having achieved political independence from the Anglo-French condominium rule in 1980. It comprises an archipelago of about 85 islands located in the Southwest Pacific, approximately 2,300 kilometres off the coast of Australia. The economy of Vanuatu with a total population of 220,000, is dual in nature with subsistence agriculture dominating in all but the two islands of Efate, on which the capital, Port Vila, is situated, as is Santo, which has the major port. The country is prone to natural disasters, which include four to seven cyclones on average each year, affecting parts of the country and about 2000 earth tremors of varying intensity. In addition, Vanuatu's inadequacy in human resources, both in public services and the private sector, has led to near permanent dependency on expatriate technical services in several areas.

On the basis of the criteria[1] established by the United Nations Committee on Development Planning, Vanuatu, along with 23 other small island and developing States (SIDS), has been designated since 1971[2] as a least developed country (LDC) among the developing countries (Encontre, 2004). Although on the basis of the threshold income level Vanuatu was found eligible for graduation from LDC status in 1997, it was allowed to retain LDC status on the grounds of perceived deterioration in the quality of life following a major earthquake in 2002, which inflicted severe damage to public and private property in Port Vila.[3]

Due to LDC status, the country has been favoured with generous foreign aid in terms of both pure grants and technical assistance from Australia and New Zealand, the two major metropolitan powers in the region as well as from the

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[1]   The current criteria (2006) in operation are: (i) economic vulnerability index (EVI); and the augmented physical quality of life index (APQLI). Present requirements are: a GDP per capita less than US$ 1,035; an APQLI score greater than 64; and an EVI score of less than 34. The earlier (2003) criteria did not include EVI, but included the following: threshold per capita GDP of US$ 765; an augmented physical quality of life index of 47; economic classification index of 26; and threshold population of 75 million. As of September 2006, there are 78 IDA-eligible countries, 50 of which have been designated as LDCs (UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, 2006). Twelve of them have also been designated as small island and developing States (SIDS). Although eight of them graduated, they were brought back to LDC status due to adverse developments subsequent to their graduation (Delaney, 2006).

[2]   See General Assembly Resolution 2768 (XXVI) of 18 November 1971.

[3]   Before the earthquake of 2002, the Prime Minister of Vanuatu pleaded in his 1997 address to the United Nations General Assembly for the retention of LDC status. In its resolution of 18 December 1997, the General Assembly decided to postpone consideration of the recommendation to graduate Vanuatu (Encontre, 2005).

European Union. In addition, Vanuatu has been receiving loan assistance on concessional terms from multilateral funding agencies.[4]

Despite the substantial annual inflows of aid ever since its independence, the economic performance of Vanuatu has been observed to be weak, with continuing stagnation in per capita income since the early 1990s (Sugden and Tevi, 2004; Gay 2004; UNESCAP, 2002). Two studies by Hughes (2003, 2004) under the auspices of the Australian think tank, the Centre for Independent Studies, were highly critical of the effectiveness of foreign aid to the Pacific island countries, including Vanuatu. Following these two studies, came the announcement in March 2006 that the United States Millennium Challenge Corporation approved a five-year US$ 65.69 million compact with Vanuatu. This provoked further criticism from Hughes and Sodhi (2006) that the United States Government's decision was not justifiable in light of the ineffective use of aid.

There have been no studies on the nexus between aid and growth in Vanuatu. The only related study available is Hughes and Sodhi (2006), which did not use data extending more than 10 years. Since the sample period was so small, the analysis is unlikely to be statistically rigorous. The objective of this paper is to fill the gap by undertaking an empirical study of the data available for the full period of 25 years since Vanuatu's independence in 1980, with a view to examining the effectiveness of aid on growth. The remainder of the paper is organized along the following lines: the second section provides a brief background of the economy of Vanuatu, reviewing the trends in growth and aid inflows; the third section outlines the model to be employed for the analysis and reports the results; the fourth and final section presents conclusions and recommendations with implications for policy.

II. VANUATU'S ECONOMY

Vanuatu has a much higher per capita income than the three States of Tuvalu, Solomon Islands, and Kiribati, but lower than other small island States in the region. However, the Pacific island countries themselves have lagged behind their counterparts in the Caribbean and Indian ocean regions.

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[4]   The soft loans from the Asian Development Bank and the World Bank generally have a long maturity period ranging from 30 to 40 years with an interest rate varying from 1 per cent to 0.75 per cent, generally referred to as a service charge. Hence, as these soft loans have a grant element of more than 25 per cent, they are deemed to be overseas development assistance.

Table 1. Selected key indicators

	Population ('000)	Per capita GDP (Current Prices) in US$	Human dev. index ranking	Vulnera bility index ranking	Aid per capita in US$	Aid	
						% of GDP	% of GDP
	2002	2002	2003	1997	2002	1990	2002
Caribbean region							
Antigua and Barbuda	76	10 449	60	2	192.1	1.2	1.9
Bahamas	314	15 797	50	4			
Barbados	270	9 423	30	38	12.8	0.2	0.1
Belize	256	3 382	91	25	88.6	7.6	2.6
Dominica	79	3 438	70	15	381.7	11.9	12.1
Dominican Republic	8 745	2 514	95	91	18.2	1.4	0.7
Grenada	80	4 060	66	14	117.5	6.3	2.3
Guyana	765	937	107	16	84.9	42.6	9.0
Haiti	8 132	415	153	97	8.9	5.9	4.5
Jamaica	2 651	3 008	98	19	9.2	5.9	0.3
St. Kitts and Nevis	42	7 745	49	29	683.8	5.1	8.0
St. Lucia	1 419	4 124	76	18	226.5	3.1	5.1
St. Vincent and Grenadines	120	4 060	87	21	40.1	7.8	1.3
Suriname	436	2 199	86	60	26.9	15.5	1.2
Trinidad and Tobago	1 303	7 384	57	49	5.6	0.4	0.1
Indian ocean							
Maldives	280	2 182	96	8	88.9	9.8	4.4
Mauritius	1 211	3 740	65	26	19.8	3.7	0.5
Seychelles	82	8 320	51	24	97.8	9.8	1.1
The Pacific							
Cook Islands	19	2 651	62	NA	490.9	NA	28.0
Fiji	799	2 281	92	9	41.4	3.9	1.8
Kiribati	85	530	129	NA	203.3	22.5	18.6
Papua New Guinea	5 099	523	137	31	36.4	12.8	7.2
Marshall Is.	51	2 008	121	NA	823.3	NA	49.6
Micronesia (Fed. States of)	114	1 864	120	NA	702.0	NA	37.4
Samoa	175	1 484	74	20	214.2	42.6	14.5
Solomon Islands	418	541	128	11	56.8	21.7	11.0
Tonga	98	1 347	54	3	217.2	26.3	16.4
Tuvalu	11	345	118	NA	260.0	47.2	45.0
Vanuatu	183	1 138	118	1	133.0	33.0	11.7

Source: ADB (2004), IMF (2004b), Jayaraman (2006), UNESCAP (2004), Sahay (2004), UNDP (2005), Commonwealth Secretariat (1997).

NA = Not Available

Vanuatu's apparently high average per capita income of about US$ 1,200 (mainly due to expatriate salaries in the private sector) hides deficiencies in basic human resource development aspects. Life expectancy is about 66 years and the adult literacy rate is 34 per cent. About 20 per cent of the population has no access to health services and 13 per cent has no running water supply. In terms of quality of life, taking into account indicators that include; expectancy of life at birth, mortality rate, nutrition and literacy, Vanuatu is at the bottom with the Human Development Index rank: 129 in the list of all island nations in the region and just one above Papua New Guinea: 133 (United Nations, 2004).

More than 20 per cent of the population lives in the two urban towns of Port Vila (the capital) and in Luganville on Santo Island. The rural population is dispersed amongst the island group with limited inter-island communications. Land ownership is closely related to indigenous culture, generally referred to as kastom in pidgin. Bislama is the language widely spoken along with English in the urban areas. As part of the unique culture of the South Pacific region, the ownership of land is vested in the community. Thus, land is not an economic commodity, as sale is not possible to those outside the community or foreigners.

Dispersal of the population along with restricted availability of land and access to basic infrastructure and services, such as power and social services including health and education have contributed to the disparity of incomes. This is despite the prevalence of the much romanticized "subsistence affluence" among the isolated rural communities (ADB, 1997). Subsistence agriculture dominates land related economic activities, amounting to about 55 per cent of the primary sector's output, most of which is consumed by rural communities. Subsistence agriculture also determines the reservation wage. Under the current minimum wage law, the urban wage, which takes into account the transfer cost to Port Vila and Luganville has been fixed at vatu 20,000 per month. At the current exchange rate of US$ 1 = vatu 115, this amounts to US$ 174 per month. Skilled labour in urban areas is remunerated at a much higher rate – one of the highest in the region.

In the 1980s, four major agriculture products, copra, cattle (beef), cocoa and *kava*, which were once referred to as the "four Cs", supported the rural population and to this day they continue to be the main source of cash income to pay for the children's education and medicines, kerosene and others. Copra is marketed by the state owned Vanuatu Commodities Marketing Board, which has proven over time to be an inefficient state enterprise. Cocoa, coffee and kava exports are handled by the private sector. These products along with vegetables and fruits, mainly for domestic consumption, contribute 15 per cent of the gross

domestic product (GDP). In the 1980s, copra accounted for 35 per cent of total exports, while shares of beef and cocoa were 6 per cent and 4 per cent, respectively. Annual cyclones severely affect steady growth.

With the emergence of timber exports through middlemen acting on behalf of Malaysian and Korean companies, with concomitant environmental concerns arising out of indiscriminate logging by land-owning communities, exports of cocoa and coffee receded into the background. In recent years timber has accounted for 11 per cent of total exports, copra 31 per cent and beef 9 per cent. Other exports include minerals and handicrafts. Because most of the exports are primary agricultural products that compete with those of other island economies, and because they form a small proportion of total world trade, Vanuatu is a price taker. Consequently, export earnings are subject to the high degree of variation in world prices. Since 1997, copra and cocoa prices have fallen considerably. On the other hand, prices for most manufactured goods and other strategic imports, including fuel, have risen. The resultant effects of the high variability in terms of trade are reflected in the high volatility of export earnings.

A study by Yari (2003) showed that Vanuatu suffered considerably. The instability measure of export earnings (average percentage deviation of export earnings from the exponential trend level for 1998-2000) for Vanuatu was 21.5 per cent, which is higher than that of Nauru (20 per cent), Papua New Guinea (18 per cent), Solomon Islands (17 per cent) and Fiji (14 per cent). Aside from the negative effects of the terms of trade, production levels of the commodity themselves have also fluctuated.

Frequent cyclones resulting in uprooting of crops have been the main reason for these variations in output. Damages to farm and hinterland roads linking marketing centres and harbours and jetties in remote islands have also had adverse effects. Delays in the restoration of these links further adversely affected exports and rural incomes.

Air links brought increasing tourism revenue that helped counter import deficits until the late 1990s. Nearly 60 per cent of total foreign exchange earnings are contributed by tourism, which also dominates the services sector.[5] However,

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[5]   The services sector of Vanuatu is marked by the significant presence of an offshore financial center. Absence of direct taxation of any kind in respect of incomes and profits earned by citizens of Vanuatu and residents and non-residents alike has made Vanuatu a pure tax haven, attracting funds from industrialized nations. However, its contribution to GDP has been observed to be on the decline, especially after the European Union and the United States of America, in the wake of the 2001 terror attack, successfully persuaded Vanuatu to streamline the legislation as well as tighten surveillance measures to control money-laundering activities in recent years (Fossen, 2002).

most of the tourists preferred the two urban centres and hence, little of the tourism dollar trickled down to rural communities in other islands. In 1998 and the subsequent two years, Vanuatu suffered a heavy loss in tourism earnings due to civil unrest, when people took to the streets to protest against abuse of pension funds held in trust by the State-owned Vanuatu National Provident Fund (Jayaraman, 2003), in the country. A hefty rise in tourist arrivals in 2000 reversed the trend but with the September 11th terror attack of 2001 in the United States of America, once again tourism declined. In addition, the recessionary conditions, following September 11th, in the industrialized countries also had a negative influence on tourism earnings. Added to these unforeseen circumstances, annual cyclones and frequent tremors have also taken their toll on resort hotels and other tourist facilities.

In sum, internal shocks resulting in the annual variability in growth rates in agricultural production due to weather conditions and civil unrest, combined with external shocks including a fall in the terms of trade and a decline in demand for domestic exports including cocoa and copra have been the main causes behind the variability in national output.

On the fiscal front, Vanuatu has no direct taxation of any kind and hence there is a high degree of dependence on indirect taxation. This takes the form of high import duties, VAT, user fees and charges as well as other forms of indirect taxation. Overall fiscal deficits have remained sustainable, mainly because of generous external aid and pure grants from bilateral sources, primarily Australia, New Zealand and the European Union, see table 3.

Until the early 1990s, budgetary grants from bilateral sources were financing recurrent expenditures, which include wages and salaries of the civil service and housekeeping expenditures. Reforms in the delivery of aid in years after the mid 1990s have redirected aid towards the implementation of projects and programmes rather than for government expenditures. External aid to Vanuatu amounted to 33 per cent of GDP in 1990, which was the third highest amongst the Pacific island economies. Due to a shift in the priorities of the donors, there has been a general decline in subsequent years and Vanuatu has received much less aid. Aid was only 12 per cent of GDP in 2002. Thanks to external aid, the current account in the balance of payments has been sustainable and overall balance has been satisfactory.

Table 4 presents details of GDP growth in Vanuatu in both aggregate and per capita terms. The data presented relates to the 25 year period from 1980, when the country gained independence. Average per capita GDP growth rates have been negative during the two successive five-year periods of 1995-1999 and

Table 2. The Caribbean, Indian ocean and the Pacific region: output growth and variability

	1990-2003 Average Growth Rate (%)	SD	1990-1997 Average Growth Rate (%)	SD	1998-2003 Average Growth Rate (%)	SD
Caribbean region						
Antigua and Barbuda	3.2	3.0	3.0	3.6	3.3	0.8
Bahamas	0.4	3.8	0.9	3.5	2.2	1.4
Barbados	0.4	3.6	0.1	4.1	1.4	2.8
Belize	6.7	4.3	5.7	4.1	7.2	4.6
Dominica	1.4	2.3	2.7	1.4	0.5	3.1
Dominican Republic	4.7	4.0	3.9	4.6	5.0	2.2
Grenada	3.6	3.0	2.8	2.7	3.9	1.8
Guyana	3.3	5.2	5.9	4.1	0.5	3.2
Haiti	-0.4	5.4	-0.4	6.5	0.6	1.7
Jamaica	1.0	2.0	0.2	2.4	1.0	0.9
St. Kitts and Nevis	3.7	2.1	4.5	2.3	2.3	1.1
St. Lucia	1.7	3.2	2.7	2.4	0.8	4.8
St. Vincent and Grenadines	3.2	2.5	3.3	3.0	2.7	1.7
Suriname	2.1	5.3	0.7	6.2	2.4	1.7
Trinidad and Tobago	2.9	2.6	2.0	2.3	4.2	1.6
Indian ocean						
Maldives	7.7	3.1	8.4	3.6	6.7	2.3
Mauritius	4.6	2.2	4.7	2.4	4.4	2.0
Seychelles	3.6	2.9	4.0	3.3	2.7	2.1
The Pacific						
Cook Islands	3.3	4.2	2.7	4.6	3.5	5.3
Fiji	1.6	3.7	2.6	2.4	2.7	4.2
Kiribati	2.9	5.8	3.0	2.8	5.0	4.5
Micronesia (Fed. States of)	1.8	4.0	2.3	5.1	0.2	4.6
Papua New Guinea	3.2	6.2	5.6	8.4	-0.2	3.9
Marshall Is.	2.3	7.9	-0.9	7.7	0.3	4.6
Samoa	0.5	7.6	-8.1	11.2	3.9	2.1
Solomon Islands	0.1	5.6	2.9	3.8	-3.7	6.0
Tonga	2.5	2.8	3.3	3.5	2.3	2.1
Tuvalu	3.8	5.4	5.6	6.2	4.8	4.5
Vanuatu	2.1	3.7	4.4	4.0	0.8	3.4

Source: Jayaraman (2006).

Note: SD = standard deviation.

Table 3. Vanuatu: Key Economic Indicators

	1990-1997 average	1998-2003 average
Fiscal balance (% of GDP)	-4.0	-1.8
Balance on goods (%)	-26.5	-22.3
Growth of exports (%)	0.9	-2.2
Growth of imports (%)	4.2	2.7
Current account balance (% of GDP)	-7.9	-7.8
Overall balance (% of GDP)	-0.8	-4.2
Inflation (%)	4.4	0.8
Growth rate (%)	3.4	0.8

Source: ADB (2003), IMF (2006).

2000-2004. External aid also declined from a high of US$ 611 in constant prices during 1980-1984 to US$ 163. As a proportion of Gross National Income (GNI), aid also decreased to 15 per cent during 2000-2004 as against 32 per cent in 1980-1984.

While external aid to Vanuatu until the mid 1990s from Australia and New Zealand and other bilateral agencies was, as noted earlier, directed largely at budgetary purposes, loans from international agencies were for both physical and social infrastructure projects. This approach appeared to be sensible. Both the Asian Development Bank (ADB) and the World Bank were well experienced in funding rural and agriculture development projects of the kind the Pacific island nations needed. These projects require large capital outlays and skills in project preparation, appraisal as well as monitoring and supervision during the implementation stages. However, from the late 1990s the trend changed. Donors joined together and shifted their attention to strengthening governance, which became the buzzword in the mid 1990s.

Based on the IMF approach of tightening credit and Government expenditures, which was part of the Washington Consensus, the ADB approved in 1997 a loan of US$ 20 million for comprehensive reforms aiming at achieving good governance. Furthermore, it was specifically concentrated on improving budgetary procedures and methods and preparing manuals. The ADB was joined by Australia, which contributed technical assistance in terms of skilled expatriates. At one time, Gay (2004: 30) notes, about 42 international consultants descended on Port Vila to prepare manuals for various ministries and agencies including Finance

Table 4. Vanuatu: aid, growth and exports (averages)

	1980-1984	*1985-1989*	*1990-1994*	*1995-1999*	*2000-2004*
GDP per capita in vatu (constant prices of 2000)	80 391.12	77 292.732	82 139.85	86 087.522	77 877.4
GDP per capita in vatu growth rate (%)	2.5	-4.0	3.9	-2.1	-1.5
GDP in vatu (millions) in current prices	9 867.3	14 026.2	21 233.6	28 025.0	32 780.6
GDP in vatu (millions) (constant prices of 2000)	22 432.5	28 217.7	25 895.1	29 824.3	31 274.0
GDP growth rate (%)	5.0	-1.6	6.7	1.1	0.6
AID as per cent of GNI (%)	32.5	27.7	25.0	16.3	14.8
AID per capita in US dollars current prices of 2000	254.1	257.2	283.1	202.7	169.4
AID per capita in US dollars constant prices of 2000	611.6	425.2	350.4	218.5	163.1
AID per capita in vatu in current prices of 2000	22 127.6	28 024.8	32 744.6	24 157.9	23 071.5
AID per capita in vatu constant prices of 2000	52 072.6	46 206.2	40 513.3	25 982.6	22 235.7
Exports in vatu (millions) in current prices	2 963.8	2 329.6	2 518.4	3 655.6	3 089.8
Exports in vatu (millions) in constant prices of 2000	6 752.5	3 993.9	3 070.2	3 926.2	2 963.1
Exports as per cent of GDP (%)	29.9	16.8	11.9	13.0	9.4
Exports growth rate (%)	10.4	-6.5	3.6	3.8	1.0

Source: World Development Indicators (2004).

Asian Development Bank (2005).

and Planning and others.[6] Once they left, there were "few lasting results" (Gay, 2004). A major part of the loan proceeds were used for the payment of expatriate salaries during their stay in the country, the Government is still paying off the loans used for their salaries as "the remaining loan funds were mostly for near term consumption oriented programs, artificially giving the economy a short-term

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[6]   Gay (2004: 35) quotes from the personal communication from the Director of Trade, Industry and Investment: The Comprehensive Reform Program was "a complete waste of time. It paid for the salaries of a few consultants and did nothing for the country".

boost" (Gay, 2004: 31). In fact, consumption expenditures funded by external aid gave rise to "Dutch disease effect", raising the spectre of inflation.[7]

It is now increasingly recognized in hindsight that the ADB and bilateral agencies should have been aware that Vanuatu's problems were related to balanced regional development. External aid should have been continued for growth enhancing projects and programmes, including outer island development; such project assistance would have raised rural incomes through augmenting the supply of export-oriented commodities that would have benefited the whole country. Gay (2004) rightly noted that Vanuatu did not experience problems of a persistent rise in domestic credit, or bulging and unsustainable fiscal deficits and yawning current account deficits in balance of payments of the kind faced by Latin American countries, requiring IMF-style structural adjustment loans. Vanuatu's fiscal and current account deficits were small and sustainable.[8]

The problem for Vanuatu was more of a "trade-deficit" related one, which can be solved only by export growth promotion measures. For a subsistence oriented Pacific island nation, such as Vanuatu, it is necessary to step up agricultural production, through physical infrastructure projects in terms of better farm roads, roads connecting hinterlands to jetties in remote islands (so that surplus farm produce enters markets for cash generation), as well as establishing processing facilities enabling the emergence of value added industries utilizing the raw materials for coconut milk, cream and oil and the like. Instead, the ADB and bilateral agencies preferred big bang programmes under the "banner of governance" (Sugden and Tevi, 2004: 17). No doubt, aid works in an environment of good governance, however, the time has come for the donor community to strike a balance between assistance for project development and governance.

The next section presents the methodology for testing a long run relationship between growth and aid during the previous 25-year period.

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[7] Two recent studies Rajan and Subramanian (2005), Raghuram and Subramanian (2005) indicated that some of the aid receiving countries in Africa were under the influence of the "Dutch disease", the effect of which is reflected in the appreciation of the real exchange rate. Appreciation of exchange rates has been seen to adversely affect the competitiveness of exports, thereby weakening economic growth.

[8] This point was made by Jayaraman (2002) while evaluating the proposal made by Knapman and Saldanha (1999) for a Currency Board Arrangement (CBA) for Vanuatu. Jayaraman described the CBA as an invasive procedure which was not warranted, since the island country did not experience any spiraling inflation or currency crises of the kind experienced by Latin American countries.

III. DATA, MODELING METHODOLOGY AND RESULTS

The choice of modeling methodology for the empirical analysis of aid effectiveness in Vanuatu is highly constrained by the deficiency of reliable time series data. Unfortunately, a lack of attention to building good statistical databases has been a common feature in all the island countries.[9] Since Vanuatu gained independence only in 1980, national income data for earlier years are not available. Because aid effectiveness has to be studied over a long period, spanning to 20 to 30 years, lack of data for a number of relevant variables has been a major handicap. The only longer time series data available are: gross domestic product; aid in highly aggregated form without any distinction between technical assistance and project or programme aid; and earnings from exports. All the data are drawn from World Development Indicators (WDI), published by the World Bank (2005). Data relating to investment expenditure, projects and other budget items including recurrent government expenditure on wages and salaries are not consistently available over the period either from WDI or from official sources so as to form reliable time series for a 26-year period (1979-2004). Under these circumstances, we utilized only three variables, namely GDP, aid and exports for which data series were available in the following empirical analysis.

The hypotheses to be tested are: (i) aid enhances the productive capacity of the country; (ii) consequently, higher production and movement of products from hinterlands, rural communities and remote islands to commercial centres and ports would lead to a rise in traditional exports including copra, beef and fish; and (iii) a rise in export would result in growth. In our estimation procedure, we use the data in real and per capita terms, such as GDP per capita (GDPPC), exports per capita (EXPPC) and aid per capita (AIDPC).

Modeling Strategy

For examining possible long-term relationships amongst GDPPC, EXPPC, and AIDPC, we resort, in the first instance, to the autoregressive distributed lag (ARDL) bounds testing approach proposed by Pesaran and others (2001). The advantages of this approach are that it allows testing for the existence of a cointegrating relationship amongst variables in levels irrespective of whether these variables are I(0) or I(1), and it is more appropriate (than the Johansen-Juselius multivariate approach) for testing for long run relationships amongst variables when

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[9]   Hughes (2006) comes down heavily upon this deficiency, by pointing out that poor personnel policies, contribute to jobs in the Bureau of Statistics being considered as dead ends to careers. Further, governments have created an environment of suspicion that statisticians were expected "to produce politically suitable data" (Hughes 2006: 3).

the sample size is small (Pesaran and others, 2001). For these reasons, the ARDL procedure has become increasingly popular in recent years and we begin the empirical analysis with this procedure.

Expressing the variables in logarithmic terms, the test for cointegration is based on the following error correction version of the ARDL model pertaining to the three variables of interest:

$$\Delta LGDPPC_t = \alpha_0 + \sum_{i=1}^{m1} \alpha_{1i} \Delta LGDPPC_{t-i} + \sum_{i=1}^{m2} \alpha_{2i} \Delta LEXPORTS_{t-i} + \sum_{i=1}^{m3} \alpha_{3i} \Delta LAIDPC_{t-i}$$
$$+ \gamma_1 LGDPPC_{t-1} + \gamma_2 LEXPORTS_{t-1} + \gamma_3 LAIDPC_{t-1} + \varepsilon_t \tag{1}$$

where ε_t is the disturbance term.

In Equation (1) the null hypothesis is that the three series are not cointegrated, which has the testable form of

$$H_0 : \gamma_1 = \gamma_2 = \gamma_3 = 0 \text{ vs } H_a : \text{Not } H_0$$

Following Pesaran and Pesaran (1997) this null hypothesis may conveniently be tested with the familiar F-statistic, which, however, has a non-standard asymptotic distribution under both H_0 and H_a. Appropriate critical values are reported in Pesaran and Pesaran (1997; Appendix C) for different numbers of regressors (three in our case), and whether the ARDL model contains intercept and/or trend terms. Two sets of critical values are given – one set assumes that all variables are I(1) and the other assumes they are all I(0) – providing a band covering all possible classifications of the variables into I(1) and I(0). Values of the calculated F-statistic above the upper level of the band indicate rejection of the null of no cointegration, whereas values below the lower level of the band support the conclusion of no cointegration. The test is inconclusive if the F-statistic falls within the band, in which case we resort to the traditional practice of conducting unit root tests followed by other tests for cointegration.

Empirical Results

Using the 26 annual observations (1979-2004) described above, it was found that a common lag length of m1 = m2 = m3 = 2 was sufficient to account for serial correlation in the ordinary least squares (OLS) residual for the ARDL test equation (1). As the resulting value of the F-statistic, 3.98, fell between the lower and upper bounds of 3.17 and 4.14, respectively, the results regarding cointegration were inconclusive. These results were invariant to the choice of dependent variable

to use in equation (1).[10]   That is, the ARDL bounds tests did not provide any strong evidence that per capita GDP, exports and aid were tied together in a long-run relationship.

Consequently, following Kremers and others (1992), we also carried out a test for cointegration based on the significance of the coefficient of the lagged error correction term (λ) in an error correction model.[11]   Based on an underlying ARDL model with lag lengths (1, 1, 0) selected by the Hannan-Quinn criterion, the following ECM model specification was used

$$\Delta LGDPPC_t = \alpha_0 + \alpha_1 \Delta LGDPPC_t + \alpha_2 \Delta LEXPORTS_t + \alpha_3 \Delta LAIDPC_t$$

$$+ \lambda ecm_{t-1} + \varepsilon_t$$

(2)

where $ecm_{t-1} = (LGDPPC - \delta_0 - \delta_1 LEXPORTS - \delta_2 LAIDPC)_{t-1}$

The long run coefficients are derived from the estimated ARDL(1, 1, 0) as follows

**Table 5. Estimated long run coefficients using the ARDL approach
ARDL(1, 1, 0) selected based on Hannan-Quinn criterion**

Dependent variable is LGDPPC				
Regressor		*Coefficient*	*Standard error*	*T-ratio [prob]*
C	$(\hat{\delta}_0)$	9.5290	1.3469	7.0749 [.000]
LEXPORTS	$(\hat{\delta}_1)$	.1027	.1017	1.0098 [.326]
LAIDPC	$(\hat{\delta}_2)$	.0908	.1209	.75118 [.462]

Note firstly that the long run parameters are not estimated with a great deal of precision given the relatively large estimated standard errors for $(\hat{\delta}_1)$ and $(\hat{\delta}_2)$. Moreover, although the estimated parameters (elasticities) have the expected signs they are of small magnitude.

The resulting estimated error correction model is summarized in table 6.

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[10] The calculated values of the F-statistics were 3.94 and 0.03 for LEXPORTS and LAIDPC, respectively.

[11] We firstly conducted ADF unit root tests with the result that each variable is I(1). Details are not shown, in order to conserve space, but are available upon request.

Table 6. Estimated Error Correction Model

Dependent variable is ΔLGDPPC			
Regressor	*Coefficient*	*Standard error*	*T-ratio [prob]*
ΔLEXPORTS	.14760	.037139	3.9742 [.001]
ΔLAIDPC	-.1561E-3	.8326E-3	-.18750 [.853]
ecm (-1)	-.26186	.084658	-3.0932 [.006]
R-squared	.51437	R-bar-squared	.46812
S.E. of regression	.040411	F-stat. F (2, 21)	11.1213 [.001]
Mean of dependent variable	.0022506	S.D. of dependent variable	.055411
Residual sum of squares	.034295	Equation log-likelihood	44.5552

From table 6 we see that in the short-run, growth (ΔLGDPPC) responds in a statistically (and economically) significant manner to the relative growth in exports, and in response to the previous year's long run disequilibrium. That is, just over 26 per cent of last year's disequilibrium is "corrected" in the current year.

The null hypothesis of no cointegration is expressed as **H_0: λ = 0 vs H_a: λ < 0.** The test statistic is **τ($\hat{λ}$) = -3.0932**, which, using the critical values tabulated in Banerjee and others (1998), has a 10 per cent critical value of -3.24. Hence this test also fails to find significant statistical evidence that these three series form a cointegrating relationship.

In order to be as thorough as possible in our empirical investigations, we also developed two bivariate models to search for significant relationships between exports and growth, and aid and exports in Vanuatu. In summary, the results for the export-growth model are presented below.

(i)   Exports-growth nexus

Using the OLS results from the following ARDL(1, 1) model

$$LGDPPC_t = β_1 + β_2 LEXPORTS_t + β_3 LEXPORTS_{t-1} + β_4 LGDPPC_{t-1} + ε_t \qquad (3)$$

We obtained the long run equilibrium coefficients shown in table 7.

Although the estimated long run export-elasticity coefficient (0.12215) has a positive sign, it is only marginally statistically significant with a 1-tailed p value of 0.068. In the error correction modelling exercise with ΔLGDPPC as the dependent model (table 8) we observe that from the estimated ECM coefficient (-0.39669) there seems to be a fairly rapid movement towards a possible long-run equilibrium

Table 7. Long run coefficients for exports-growth relationship (H-Q criterion)

Dependent variable is LGDPPC			
23 observations used for estimation from 1982 to 2004			
Regressor	Coefficient	Standard error	T-ratio [prob]
LEXPORTS	.12215	.078526	1.5556 [.136]
C	10.3079	.64663	15.9410 [.000]

Table 8. Error correction representation for equation (3)

Dependent variable is ΔLGDPPC			
23 observations used for estimation from 1982 to 2004			
Regressor	Coefficient	Standard error	T-ratio [prob]
ΔLEXPORTS	.15174	.043873	3.4585 [.002]
ΔC	4.0891	1.5487	2.6403 [.016]
ecm (-1)	-.39669	.14530	-2.7301 [.013]
R-Squared	.49946	R-bar-squared	.42043
S.E. of regression	.042926	F-stat.　　F (2, 20)	9.4796 [.001]
Residual sum of squares	.035010	Equation log-likelihood	41.9719

relationship (about 2.5 periods on average). The fact that this coefficient is statistically significant (p-value = 0.013) suggests that exports and real income are joined in a systematic long run relationship.

(ii)　　　　Aid-Exports nexus

For the aid-exports relationship, however, the statistical results shown in table 9 were much less conclusive. In fact, the estimated long run aid-exports elasticity coefficient was perversely *negative* (-0.13351) although it was clearly not statistically significant (p-value = 0.762).

Moreover, as revealed by the results for the ECM model in table 10, even for the short run the coefficient for the change in aid is negatively signed (-0.0402). Just as for its long run counterpart, it fails to be statistically significant as well (p-value = 0.75).

Hence, even from a simple bivariate perspective, we are not able to find empirical evidence to support the idea that foreign aid has helped to promote income growth in Vanuatu, via a positive influence on exports.

**Table 9. Estimated long run coefficients from ARDL(1, 0)
model (H-Q criterion)**

Dependent variable is LEXPORTS			
23 observations used for estimation from 1982 to 2004			
Regressor	Coefficient	Standard error	T-ratio [prob]
LAIDPC	-.13351	.43555	-.30654 [.762]
C	9.5572	4.5096	2.1193 [.047]

Table 10. Error Correction representation for the aid-exports relationship

Dependent variable is ΔLEXPORTS			
23 observations used for estimation from 1982 to 2004			
Regressor	Coefficient	Standard error	T-ratio [prob]
ΔLAIDPC	-.0402	.1244	-.3235 [.750]
C	2.8810	1.5075	1.9111 [.070]
ecm (-1)	-.3014	.1476	-2.0420 [.055]
R-squared	.20130	R-bar-squared	.12144
S.E. of regression	.21958	F-stat. F (2, 20)	2.5204 [.106]
Residual sum of squares	.96430	Equation log-likelihood	3.8406

IV. SUMMARY AND CONCLUSIONS

This paper undertook an empirical study of the effectiveness of aid to Vanuatu over the last 25 years. The study employed a trivariate model adopting the ARDL bounds testing and the error correction modeling approaches to investigate whether there was a long-term relationship between aid, growth and exports. Data on aid, GDP and exports, all in constant prices and on a per capita basis were utilized. Results of empirical analysis showed there was only weak evidence of the existence of a long-term relationship amongst the three variables.

It is not unusual that the study found no link between aid and growth, since the aid data for Vanuatu is in highly aggregated form. Comparable results were also obtained in similar studies, when aggregated data were used in the absence of detailed data for projects, programmes and technical assistance. Islam (1992) and Mbaku (1993), in their studies on Bangladesh and Cameroon respectively, found that aid did not contribute to growth. Recent studies of a cross-sectional nature in Africa (Rajan and Subramanian, 2005; Raghuram and Subramanian, 2005) using aggregate data also drew this conclusion.

However, through bivariate model analyses on export-growth and the aid-export relationship in Vanuatu, it was established that exports positively influenced growth, but aid did not contribute positively to exports. It is apparent that aid has not led to any increase in the productive capacity of the country, which would have raised its export potential.

The results will not come as a surprise to the critics of aid to Vanuatu. By analyzing the data from a much shorter period and without employing any sophisticated analysis, Hughes and Sodhi (2006) came to the conclusion that aid had not benefited Vanuatu in the past. By resorting to a more detailed empirical analysis of data over a longer period, our study confirmed the finding that aid did not contribute to growth, but exports positively influenced growth. Hence, our recommendation is that external aid be re-directed towards promoting production of agricultural exports, all of which are grown by rural communities. Aid should be directed to outer island development projects, including roads connecting farms and hinterland in remote, isolated islands to ports and jetties for speedy movement of exports so that rural communities benefit through rises in their incomes as well.

Donor agencies would do well to undertake a fresh evaluation of their programmes. They should carefully review their policies and consider whether the emphasis on governance has been overdone. Further, they should strive towards striking an appropriate balance between aid for improving governance and aid for growth and income generating activities.

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