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On the Convergence of Small Island Economies with Their Metropolitan Patrons

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Summary. — This paper advances the hypothesis that the per capita GDP of small island economies, and its growth through time, are explained to a large extent by two variables: the closeness of the political linkages tying each island to a corresponding metropolitan patron in the core of the world system, and the level of per capita GDP in the metropolitan patron economy. Small islands thus converge to the income levels of their patrons, not to each other. This accounts for the absence of evidence of within-region convergence among island economies in the literature to date. Regression analysis of 22 Pacific island economies, and of 60 small islands worldwide, provides support for the hypothesis, at least over the last three decades of the twentieth century. Those island economies whose close political linkages to former colonial powers survived the transition to the post-colonial era were the ones which exhibited greatest prosperity at the end of the century. In the small-island setting, there has been no tradeoff between political dependence and material welfare; the two go hand in hand.

Key words — islands, economic growth, convergence, political dependence

1. INTRODUCTION

Neoclassical growth theory predicts a long-run tendency toward convergence of output and income per capita across the world economy, because

—technology is a global public good, so all countries should experience the same long-run rates of technical progress,

—diminishing returns imply that investment in rich countries should slow down while poor countries continue to accumulate,

—international mobility of capital and labor, combined with commodity trade, should reinforce the market forces driving convergence toward common world-wide wage rates and profit rates, and hence common living standards.

Eventually, countries' GDP per capita should differ only insofar as different countries have different savings rates and/or population growth rates, or occupy different positions in the hierarchies of technological leadership and human capital formation. These factors identify different steady-state levels of per capita income, toward which national economies appear to be converging over time (Barro & Sala-i-Martin, 1995; Mankiw, Romer, & Weil, 1992). In addition, social and political institutions seem to account for a significant part of the observed divergence across countries (Barro, 1997; Chapter 2, Hall & Jones, 1999).

Across the world economy as a whole, divergence of per capita incomes was the dominant empirical trend of the past century (Maddison, 2001; Pritchett, 1996). Barro (1991) used the newly-published Penn World Tables to demonstrate global divergence for the second half of the twentieth century, while maintaining the idea of "conditional convergence" to country-specific steady states as an underlying process. Maddison found a widening income gap over the past two centuries and identified this as "the major problem in growth analysis" (Maddison, 2001, p. 48). Lucas (2000), however, has argued that the empirical record since 1800 is consistent with a convergent long-run process, within which the divergence of income levels during the 20th century was merely a transitional phenomenon which is predicted to be reversed in the next couple of decades.

Within the diverging global economy, some "convergence clubs" have emerged. Dowrick and Nguyen (1989) demonstrated strong convergence among the OECD economies since the

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1940s, and this result is now a stylized fact of growth economics. Barro and Sala-i-Martin (1992) found convergence among the states of the United States since the 1860s, and Barro and Grilli (1994, Chapter 14) describe post-war convergence among the regions of Western Europe. Cashin (1995) found convergence among the separate colonial economies of Australia and New Zealand during 1861–1901, and Maddison (1994) found some weak evidence of regional convergence in Latin America and East Asia since 1800.

2. ISLANDS AND CONVERGENCE

How do small island economies relate to these global trends? Small size and geographical isolation are often viewed as sources of economic vulnerability which might adversely affect growth performance (e.g., Briguglio, 1995). Empirically, however, "vulnerability" as usually measured appears to have a positive, not negative, association with economic growth performance (Armstrong & Read, 2000, 2002).

In particular, a number of studies have found clear evidence of a positive association between political dependence on larger states and levels of real per capita income in small islands. Bertram (1999a, 1999b, p. 338, Table 28.2) found that for a sample of 22 Pacific island economies, sovereign independent microstates had an average per capita GDP of only US$1,229 compared with US$2,187 for territories "in free association" with the United States and New Zealand, and US$22,615 (or $14,423 excluding Hawaii) for territories that were politically integrated with France, the United States and New Zealand. A similar exercise using purchasing-power-parity (PPP) data from the *CIA World Factbook* (2001) shows sovereign Pacific island states with average per capita income of $2,897, associated territories with $4,665, and politically-integrated territories with $26,650, in a region with average overall per capita GDP of $7,841.

Poirine (1999, Table 1) showed similar results for Pacific islands in 1992: independent islands with per capita GDP of $1,013 compared with "territories and associated states" (excluding Hawaii) with $11,975.

McElroy and Mahoney (2000, Tables 1 and 2) classified their sample of island economies into two categories: "dependent" (comprising territories freely associated or politically integrated with metropolitan nations) and independent. They estimated that dependent islands in the Caribbean had per capita GDP of $11,214 compared with $5,898 for sovereign independent island states. For the Pacific, they estimated per capita GDP as $6,148 for dependent territories compared with $3,218 for sovereign independent states.

Armstrong and Read (2000), working with a larger global sample of small economies, also report a significant negative association between political sovereignty and per capita income.

These results suggests that in exploring the issue of per-capita income convergence for small island states it may be more fruitful (especially in the case of politically dependent territories) to investigate the hypothesis of convergence between individual island economies and their metropolitan patron economies, than to seek patterns of regional convergence amongst island economies as a group. This is reinforced by the negative results from the one major empirical study which has investigated the hypothesis of regional convergence amongst island economies.

Cashin and Loayza (1995) looked for within-region convergence of Pacific island economies. Their hypothesis was that the experience of Europe and the United States would be replicated in other regions such as the Pacific—in other words, that the Pacific island economies, because of their geographic location within a single region, might have tended to converge to a common mean income level. They found, on the contrary, that although the data were consistent with convergence of each individual economy towards some steady state (which Cashin and Loayza interpreted as the Solow-Swan steady state), regional per capita output had diverged over 1971–93, with official and private transfer payments merely providing a counterbalance sufficient to hold the dispersion of per capita disposable income constant over the two decades. This result held for both the PAC9 data set (seven small-island economies plus Australia and New Zealand) and the PAC7 and PAC5 data sets (small-island economies only).

An alternative explanation of their results would be that each island economy has been converging to the income level of a counterpart large economy or economies in the core of the global economy, so that island living standards derive their relativities from sources external to the region, and the steady states to which island economies converge are tied to those of their

metropolitan patrons. The Cashin–Loayza results appear consistent with the proposition that island economies operate largely in isolation from each other on the periphery of the global system, with their main economic linkages running from individual islands to metropolitan patron economies on the basis of historically established geopolitical and trade networks.

The Pacific islands, for example, have none of the features of an economic, as distinct from a geographic, region. Inter-island trade is less than 2% of total exports (McGregor, Sturton, & Halapua, 1992, p. 21), and the principal migration paths lead out of the geographic region. Historically, the Pacific is not a self-contained economic system, but a mosaic of overlapping external spheres of economic as well as geopolitical influence (Poirine, 1995, 1999). Most islands have both historic and ongoing ties to former colonial powers, and the connections with those patron economies include (to varying degrees) trade (especially imports), migration access, citizenship, currency, aid, consumption aspirations (tastes), and language.

Similarly, the small island states and territories of the Caribbean, Atlantic, and Indian Ocean continue to display inherited linkages with the various colonial and post-colonial powers which have been influential in those regions.

3. REGRESSION ANALYSIS

This section of the paper explores two hypotheses:

—The level of GDP per capita of small island economies, and its growth rate, depends directly on the level and growth rate of GDP per capita in their metropolitan patron economies.

—The per capita income of small peripheral island economies depends directly on the strength of their political ties with the relevant metropolitan patron.

Data have been drawn from two main sources: the *CIA World Factbook* (2001) and the Asian Development Bank's *Key Indicators of Developing Member Countries*. The first of these provides estimates of total and per capita real GDP on a PPP (purchasing power parity) basis, along with data on population, trade, currency, and political status, for a cross-section of 60 small island states and territories (with smallness defined as less than three million population). Of these, 11 are in the Atlantic Ocean, 22 in the Caribbean, six in the Indian Ocean, one in the Mediterranean, and 20 in the Pacific. The Pacific dataset is increased to 22 for some regressions by including Papua New Guinea and Hawaii.

The Asian Development Bank database has been used to construct a panel data set for the Pacific islands with a total of 88 entries at roughly five-yearly intervals from 1970–99.

Having assembled data on the island economies themselves, it was necessary to identify for each island the relevant metropolitan economy to which the island would be hypothesized to converge. Three possible criteria were considered:

—historical linkages between former colonial powers and their former or actual colonies,

—current trade links as measured by the share of imports to the island economy derived from a particular metropolitan economy,

—current spheres of political and economic influence on the basis of essentially qualitative judgement.

Appendix A presents data for the island economies covered in this study, together with tentatively identified metropolitan patron countries on the basis of the first two of the above criteria.

(a) *Results for Pacific island economies*

This section summarises the results of a regression analysis of both cross-section and panel data for 22 Pacific island economies, reported more fully in Bertram and Karagedikli (forthcoming). The island economies covered were the 21 included in the analysis in the next section of this paper, plus the larger island of Papua New Guinea (population five million).

Table 1 sets out the data for this analysis, and Figure 1 provides a scatter plot. Metropolitan patron economies were identified on the basis of import share except for Tuvalu, which was treated as linked to Australia on the basis of currency union and aid relations. The scatter plot provides visual evidence of a positive relationship between degree of political dependence and GDP per capita, and also of a positive effect of GDP per capita in the metropolitan patron economy.

An ordinary least squares (OLS) regression confirmed that both political status and

Table 1. *Data for Pacific islands cross-section regression, about 1999*

	GDP per capita, PPP estimates, US$	Patron economy	Patron economy's GDP per capita, PPP estimates 1999	Political status of the island territory
American Samoa	8,000	USA	36,200	Integrated
Cook Islands	5,000	New Zealand	17,700	Associated
Fiji	7,300	Australia	23,200	Independent
French Polynesia	10,800	France	24,400	Integrated
Guam	21,000	USA	36,200	Integrated
Hawaii	34,312	USA	36,200	Integrated
Kiribati	850	Australia	23,200	Independent
Marshall Islands	1,670	USA	36,200	Associated
Micronesia, FSM	2,000	USA	36,200	Associated
New Caledonia	15,000	France	24,400	Integrated
Niue	2,800	New Zealand	17,700	Associated
Nauru	5,000	Australia	23,200	Independent
Northern Marianas	12,500	USA	36,200	Integrated
Palau	7,100	USA	36,200	Associated
Papua New Guinea	2,500	Australia	23,200	Independent
Samoa	3,200	New Zealand	17,700	Independent
Solomon Islands	2,000	Australia	23,200	Independent
Tokelau	1,000	New Zealand	17,700	Integrated
Tonga	2,200	New Zealand	17,700	Independent
Tuvalu	1,100	Australia	23,200	Independent
Vanuatu	1,300	Japan	24,900	Independent
Wallis and Futuna	2,000	France	24,400	Integrated

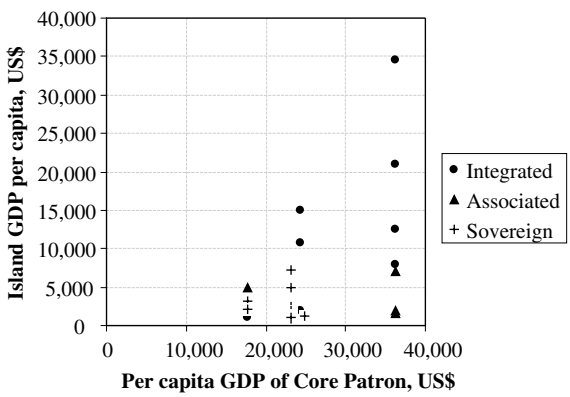

Figure 1. *GDP per capita in 22 Pacific island economies and their metropolitan patrons, by political status, 1999.*

metropolitan partner GDP per capita were significantly associated with island GDP per capita. Variables in the regression were:

ISLY Island GDP per capita, purchasing-power-parity basis.

INT Dummy variable for political dependence, taking the value 1 for territories politically integrated with metropolitan states; otherwise zero.

METY GDP per capita in the corresponding metropolitan economy.

Regression results are reported in Table 2, first for the full 22-island data set, then for a 21-island dataset excluding the large island of Papua New Guinea and then for a 20-island dataset also excluding Hawaii.

Roughly interpreted these results mean that, for the 20 smaller Pacific island economies at

Table 2. *Cross-section regression results for Pacific island economies*

	Constant	*INT*	*METY*	R^2	Adjusted R^2
22 Island economies including PNG	−5,920 (−1.12)	8,137 (2.76)	0.369 (1.86)	0.462	0.405
21 Island economies excluding PNG	−5,903 (−1.11)	8,126 (2.66)	0.369 (1.81)	0.454	0.394
20 Island economies excluding PNG and Hawaii	−2,120 (−0.57)	6,016 (2.87)	0.216 (1.54)	0.449	0.384

the end of the 1990s, being politically fully integrated with a patron economy in the global core (as distinct from being politically associated or independent) added about US$6,016 to per capita income.

Essentially the same analysis was conducted for a panel data set derived from Asian Development Bank data, with 88 observations spanning 1970–99, presented in Appendix B. Data limitations did not allow observations for each country at each time. For example, the first observation for the Fiji is 1970, whereas the first observation for the Cook Islands is 1975. Despite these gaps in the data set, Bertram and Karagedikli argue that omitted variables bias does not significantly affect the results.

Fourteen island economies in the panel have at least four entries (representing 15 years of data coverage), though only four (Fiji, French Polynesia, Hawaii and the Solomon Islands) have GDP data right back to 1971. The other eight Pacific island economies included have only a single entry each, for (approximately) 1999. The time dimension of the panel is five yearly intervals, over 1970–2000.

PPP data for GDP were not available for the earlier years. Therefore to construct the panel, nominal GDP per capita for each island economy at (roughly) five-year intervals was converted to US dollars using the current nominal exchange rate, and deflated to 1996 using the US GDP deflator. Each island economy was then paired with the relevant metropolitan patron economy's GDP per capita, also converted to US dollars at the current exchange rate and then deflated to 1996 dollars, with dummy variables used to distinguish amongst politically integrated territories, politically associated states (a looser dependent status short of full independence) and island states which were independent at the time. Selection of metropolitan patrons differed slightly from that used for the cross-section regression reported above, since a number of island territories changed their political status during the period. Politically dependent (integrated) territories were paired with the relevant colonial power as patron, whereas import source, currency, and aid linkages were used to assign patrons to politically associated and independent economies.

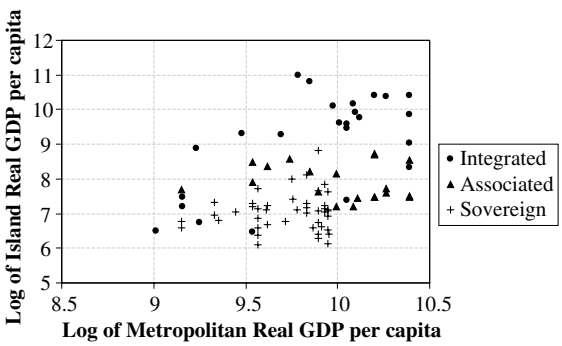

Figure 2. *Scatter plot of real per capita GDP in Pacific island economies and their metropolitan patrons, 1971–99, five-yearly panel data in logs.*

Table 3. *Estimated relationship of log of island per capita GDP with log of metropolitan per capita GDP and political dependence: pooled regression 1970–99*

	Constant α	*INT* β	*ASSOC* γ	*METY* δ	1975	1980	1985	1990	1995	1999	R^2	Adjusted R^2
(1)	−3.855	1.815	0.503	1.127	−0.010	0.282	0.052	−0.089	0.008	−0.200	0.550	0.497
	(−0.947)	(6.226)	(1.866)	(2.576)	(−0.019)	(0.483)	(0.098)	(−0.161)	(0.013)	(−0.332)		
(2)	−3.173	1.831	0.475	1.055	0.114	0.321	0.073	−0.035	0.069	−0.145	0.549	0.491
	(−0.732)	(5.782)	(1.702)	(2.260)	(0.210)	(0.537)	(0.137)	(−0.063)	(0.116)	(−0.235)		
(3)	0.630	1.482	0.577	0.632	0.331	0.613	0.258	0.265	0.408	0.320	0.412	0.330
	(0.172)	(4.196)	(2.335)	(1.590)	(0.597)	(0.930)	(0.446)	(0.453)	(0.647)	(0.505)		

Eqn. (1) is for 22 Pacific island economies including Papua New Guinea.
Eqn. (2) is for 21 Pacific island economies excluding Papua New Guinea
Eqn. (3) is for 20 Pacific island economies excluding PNG and Hawaii.

Figure 2 presents a scatter plot of the panel data, relating the log of metropolitan per capita GDP to the log of island per capita GDP, with the sample broken down into the three political categories Integrated, Associated and Sovereign.

The model estimated was

$$ISLY_t = \alpha + \beta INT + \gamma ASSOC + \delta METY + Timedummies + \varepsilon,$$

$t = 1970, 1975, 1980, 1985, 1990, 1995, 1999.$

Here *INT* is again a dummy for full political integration, while *ASSOC* is a dummy for associated political status (intermediate between integration and full independence).

The model was estimated in logs (since there is a real GDP variable present on both sides). This avoids most of the problem of heteroscedasticity arising from the cross-sectional dimension of the data set. Time dummies were included for all the time dimensions except $t = 1970$.

Results are in Table 3, first for the 22-island dataset, then for the dataset excluding the large island of Papua New Guinea, and then also excluding Hawaii.

Both political integration and metropolitan GDP variables have the predicted effect and are significant at the 1% level except in Eqn. (3), where *METY* is significant only at 10%. The *ASSOC* dummy is significant at 5% and has the predicted sign. The time dummies are not significant, indicating no evidence of any growth trend in the Pacific region independent of the growth of the metropolitan economies. Levels estimation of this data indicates that a $1 increase in the per-capita GDP of the

Table 4. *Data for 32 small island economies with well-identified patrons*

Island	GDP per capita $PPP	Political classification	Patron state	Patron GDP per capita	Region
Mayotte	600	Dependent	France	24,400	Indian Ocean
Comoros	720	Independent	France	24,400	Indian Ocean
Tokelau	1,000	Dependent	New Zealand	17,700	Pacific
São Tome and Principe	1,100	Independent	Portugal	15,800	Atlantic
Marshall Islands	1,670	Associated	USA	36,200	Pacific
Cape Verde	1,700	Independent	Portugal	15,800	Atlantic
Micronesia, FSM	2,000	Associated	USA	36,200	Pacific
Wallis and Futuna	2,000	Dependent	France	24,400	Pacific
Saint Helena	2,500	Dependent	UK	22,800	Atlantic
Niue	2,800	Associated	New Zealand	17,700	Pacific
Samoa	3,200	Independent	New Zealand	17,700	Pacific
Reunion	4,800	Dependent	France	24,400	Indian Ocean
Cook Islands	5,000	Associated	New Zealand	17,700	Pacific
Nauru	5,000	Independent	Australia	23,200	Pacific
Palau	7,100	Associated	USA	36,200	Pacific
American Samoa	8,000	Dependent	USA	36,200	Pacific
Guadaloupe	9,000	Dependent	France	24,400	Caribbean
French Polynesia	10,800	Dependent	France	24,400	Pacific
Saint Pierre and Miquelon	11,000	Dependent	France	24,400	Atlantic
Martinique	11,000	Dependent	France	24,400	Caribbean
Northern Marianas	12,500	Dependent	USA	36,200	Pacific
Virgin Islands	15,000	Dependent	USA	36,200	Caribbean
New Caledonia	15,000	Dependent	France	24,400	Pacific
Man, Isle of	18,800	Dependent	UK	22,800	Atlantic
Falkland Islands	19,000	Dependent	UK	22,800	Atlantic
Guernsey	20,000	Dependent	UK	22,800	Atlantic
Greenland	20,000	Dependent	Denmark	25,500	Atlantic
Faroe Islands	20,000	Dependent	Denmark	25,500	Atlantic
Guam	21,000	Dependent	USA	36,200	Pacific
Iceland	24,800	Independent	Denmark	25,500	Atlantic
Jersey	24,800	Dependent	UK	22,800	Atlantic
Hawaii	34,102	Dependent	USA	36,200	Pacific

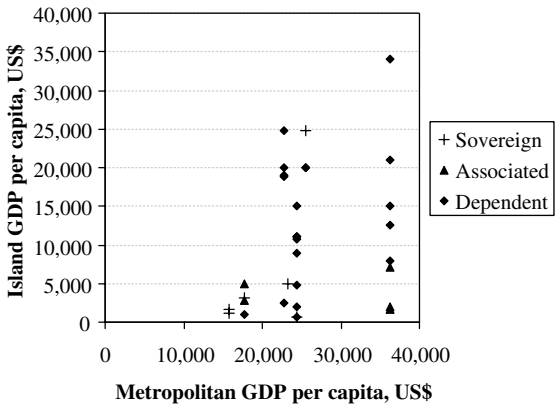

Figure 3. *Scatter plot of real per capita GDP in 32 island economies and their metropolitan patrons.*

metropolitan patron economy increases the per capita GDP of its linked island economies by $0.44, an estimate similar in order of magnitude to the results from the earlier simple cross-section analysis.

The fit of the model is reasonable with an adjusted R-squared of 0.491 with Hawaii included or 0.330 with Hawaii excluded. Although there is undoubtedly some omitted-variable bias in this model, along with significant data limitations, the results appear robust.

(b) *Results with a global dataset*

This section addresses the question whether the Pacific results are representative of small islands elsewhere in the world. For this purpose the *CIA World Factbook* (2001) data in Appendix A have been used to conduct cross-section regressions at world and regional level.

Again the approach is to regress island per capita GDP in purchasing power parity against the degree of political dependence on a metropolitan state and the per capita GDP of the relevant metropolitan patron economy.

The main difficulty for this wider analysis is the identification of metropolitan patrons for many small islands, especially in the Caribbean where the strong regional political and economic influence of the United States is overlaid on older colonial ties with European powers. To address this, the first stage of analysis is restricted to 32 island economies with clearcut patron states. These are identified, and the relevant data arrayed, in Table 4. Figure 3 provides a scatter plot. Iceland appears as an outlier—a sovereign independent island with very high per capita GDP. The main drawback of this sample is that it is numerically dominated by the Pacific region (21 of the 32 observations).

Table 5. *Regression results for worldwide sample of 32 small islands with clearcut patrons, c1999*

Dependent variable is *ISLY*			
Regressor	Coefficient	Standard error	*t*-Statistics
Constant	−14,517	5,619	−2.584
METY	0.563	0.246	2.285
INT	4,243	3,572	1.188
ASSOC	−4,793	4,828	−0.993
PACIFIC	6,820	2,623	2.600
ATLANTIC	13,705	2,903	4.722
CARIBBEAN	5,999	1,944	3.087
R^2	0.494		
Adjusted R^2	0.373		

The regression model includes metropolitan GDP and separate dummies for political status and region. Variables are:

ISLY: Log of per capita PPP GDP of island economy
METY: Log of per capita PPP GDP of relevant patron economy
INT: Politically integrated
ASSOC: Politically associated, but not integrated, with a metropolitan state
PACIFIC: Pacific Ocean
ATLANTIC: Atlantic Ocean
CARIBBEAN: Caribbean

Table 6. *Regression results for worldwide sample of 63 small island economies*

Dependent variable is *ISLY* (63 observations)			
Regressor	Coefficient	Standard error	*t*-Statistic
(1) Using colonial powers as patrons in 31 ambiguous cases			
Constant	5,282	2,794	1.776
METY	0.431	0.180	2.398
INT	5,650	2,226	2.538
ASSOC	−2,688	3,119	−0.862
PACIFIC	−11,307	1,742	−6.491
ATLANTIC	−4,179	3,109	−1.344
CARIBBEAN	−6,739	2,072	−3.253
INDIAN	−12,979	2,864	−4.532
R^2	0.409		
Adjusted R^2	0.334		
(2) Using main import sources as patrons in 31 ambiguous cases			
Constant	6,259	2,416	2.702
METY	0.310	0.126	2.452
INT	7,504	2,087	3.596
ASSOC	−1,439	2,446	−0.588
PACIFIC	−10,306	1,769	−5.827
ATLANTIC	−4,053	3,275	−1.238
CARIBBEAN	−9,113	2,487	−3.665
INDIAN	−11,513	3,302	−3.487
R^2	0.407		
Adjusted R^2	0.332		
			T-ratio
(3) Using simple average of colonial power and main import source for 31 ambiguous cases			
Constant	2,725	3,714	0.734
METY	0.460	0.172	2.677
INT	6,488	1,993	3.256
ASSOC	−2,378	3,047	−0.780
PACIFIC	−9,879	1,774	−5.570
ATLANTIC	−2,869	3,147	−0.912
CARIBBEAN	−7,466	2,144	−3.481
INDIAN	−11,027	3,100	−3.557
R^2	0.422		
Adjusted R^2	0.348		

OLS regression yields the results in Table 5. Metropolitan GDP per capita and the regional dummies are significant at 5%, but both political integration and associated status lose significance. The negative sign on *ASSOC* is unexpected and contrary to the earlier results from the Pacific, but is not statistically significant. (Re-estimating the equation with *ASSOC* excluded improves the coefficient on *INT* to significance at 5%.) The elasticity of island per capita GDP with respect to metropolitan per capita GDP is 0.56.

It remains to bring into the analysis the remaining 31 island economies in Appendix A for which patron identification is ambiguous. Table 6 presents the results of three alternative approaches to this issue. In the first regression, the former or actual colonial power has been taken as the relevant patron. In the second regression the current primary source of imports is treated as the metropolitan counterparty for all islands except Netherlands Antilles, which is left tied to the Netherlands rather than transferred to Venezuela (the main

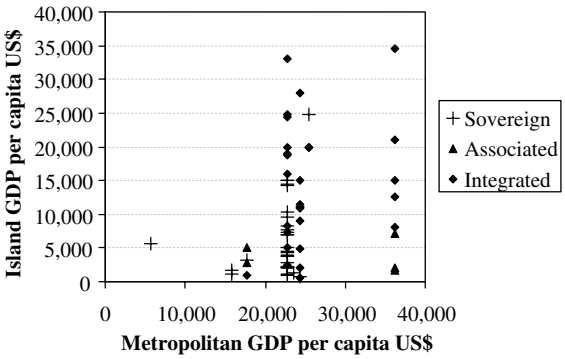

Figure 4. *Relation among METY, political status and ISLY for 61 island economies, assigning colonial powers as patrons in ambiguous cases.*

import partner on the basis of oil imports). In the third regression a simple average of colonial patron and main import source is used for *METY* (Figure 4).

The addition of the large bloc of politically-independent Caribbean islands with relatively high per capita GDP has the effect of changing the sign on the constant term in the regression model. The relationship between metropolitan and island GDP per capita remains highly significant in all three specifications with a coefficient of around 0.3–0.45 (that is, each dollar of per-capita GDP in the patron economy is associated with 30–45 cents of per capita GDP in its island satellites). Integrated political status is again highly significant and worth $5,600–7,500 of additional per capita GDP relative to sovereign independent status. Associated political status remains statistically insignificant. Regional dummies for the Pacific, Caribbean and Indian Oceans, but not the Atlantic, are strongly significant. The ranking of their coefficients shows the expected hierarchy of per capita income, with the Atlantic at the high-income end and the Indian Ocean at the low income end.

4. CONCLUSIONS

Structuralist world-systems historians (e.g., Senghaas, 1985), and proponents of enter-periphery models such as those suggested by Myrdal (1958) and Sunkel (1973), have portrayed global economic history as a dynamic interplay between centrifugal and centripetal forces in the world economy.

The analysis presented in this paper characterizes small island economies as units of the global economic periphery—units which are related bilaterally to countries in the global core rather than to other similarly-located peripheral economies. The economic forces promoting global income convergence in the long run (labor and capital migration, commodity trade, diffusion of technology and tastes) link these small island units to their patron economies in the global core, not to each other. Bilateral patron-client convergence, along the spokes linking the global core and periphery, sustains and reproduces within-region income divergence of material welfare in peripheral regions. Hence there has been no tendency for island economies to converge to one another, but there have been strong tendencies for them to converge with their patrons.

The strength of convergence forces varies positively with the degree of political dependence. Politically integrated island territories generally exhibit the highest per capita incomes. (Bermuda and Iceland stand as the main exceptions to this general proposition.) In summary, satellite economies in close political orbits (politically integrated territories) exhibit strong convergence to patron GDP while those in more distant orbits (territories in free association with metropolitan states, and fully-independent island microstates) exhibit weaker convergence and hence lower incomes.

These results are consistent with the model advanced by Poirine (1999) in which small islands "sell" strategic services to metropolitan purchaser governments, leading to a positive association among aid flows, political status

and geopolitical significance. Integrated or associated political status confers greater reliability on the strategic services offered since the relationship is more difficult to break than for independent states. The indivisibility of the strategic service supplied by each island location means an inverse relationship between population and per capita aid; this in turn is consistent with Armstrong and Read's (2000) observations regarding both the negative impact of sovereignty on per capita income and the absence of any tendency for small population size to be associated with lower per capita income.

The statistical results for Pacific island economies in this paper show a particularly strong association between political dependence and high per capita GDP. Extending the analysis to the wider set of 60 islands worldwide maintains the predictive power of metropolitan patron income and integrated political status in explaining island GDP per capita.

During the second half of the 20th century—the era of decolonization—it would appear that small island territories experienced a tradeoff between sovereign nationhood and material welfare. Whatever the rhetoric at the time, independence did not pay as well as continued political dependence. In the new century the attributes of sovereignty, such as votes at the United Nations and possession of Internet domains, may turn out to confer greater bargaining power than hitherto, but there is no clear incentive for presently-dependent island territories to seek independence, and good grounds for them to hold to the status quo.

There remain a number of issues with data and model specification to be addressed for the wider sample; in particular it would be desirable to replicate on a world scale the panel data analysis for the Pacific reported in Table 1.

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APPENDIX A

Data for a sample of 63 small island economies

Island	Area km^2	Population	GDP per capita $PPP	Political situation	Political classification	Colonial power	Main import source	Currency	Metropolitan patron if clearcut
Atlantic Ocean (11 island economies)									
São Tome and Principe	1,001	165,034	1,100	Republic, independent 1975	Independent	Portugal	Portugal (42%)	Dobra	Portugal
Cape Verde	4,033	405,163	1,700	Republic, independent 1975	Independent	Portugal	Portugal	Cape Verdean escudo CVD	Portugal
Saint Helena	410	7,266	2,500	Overseas territory of UK	Integrated	UK	UK	Saint Helena pound	UK
Saint Pierre and Miquelon	242	6,928	11,000	Territorial collectivity of France	Integrated	France	France (44%)	French franc, euro	France
Man, Isle of	572	73,489	18,800	British Crown dependency	Integrated	UK	UK	UK pound	UK
Falkland Islands	12,173	2,895	19,000	Overseas territory of the UK	Integrated	UK	UK	Falkland pound	UK
Guernsey	78	64,342	20,000	British Crown dependency	Integrated	UK	UK	UK pound	UK
Greenland	2,175,600	56,352	20,000	Part of Kingdom of Denmark	Integrated	Denmark	Denmark	Danish krone	Denmark
Faroe Islands	1,399	45,661	20,000	Part of Kingdom of Denmark	Integrated	Denmark	Denmark (28%)	Danish krone	Denmark
Iceland	100,250	277,906	24,800	Independent 1944	Independent	Denmark	Scandinavia	Iceland krona	Denmark
Jersey	116	89,361	24,800	British Crown dependency	Integrated	UK	UK	UK pound	UK
Bermuda	59	63,503	33,000	Overseas territory of the UK	Integrated	UK	USA (34%)	Bermudian dollar pegged at 1 per US$	
Caribbean (22 island economies)									
Saint Vincent & Grenadines	389	115,942	2,800	Independent from UK 1979	Independent	UK	USA (36%)	East Caribbean dollar	
Jamaica	10,830	2,665,636	3,700	Independent from UK 1962	Independent	UK	USA (48%)	Jamaican dollar	

APPENDIX A—*continued*

Island	Area km^2	Population	GDP per capita $PPP	Political situation	Political classification	Colonial power	Main import source	Currency	Metropolitan patron if clearcut
Dominica	754	70,786	4,000	Independent from UK 1976	Independent	UK	USA (41%)	East Caribbean dollar	
Grenada	340	89,227	4,400	Independent from UK 1974	Independent	UK	USA (31%)	East Caribbean dollar	
Saint Lucia	610	158,178	4,500	Independent from UK 1979	Independent	UK	USA (36%)	East Caribbean dollar	
Montserrat	100	7,574	5,000	Overseas territory of the UK	Integrated	UK	USA	East Caribbean dollar	
Dominican Republic	48,730	8,581	5,700	Independent from Haiti 1844	Independent	France	USA (26%)	Dominican peso	
Saint Kitts and Nevis	261	38,756	7,000	Independent from UK 1983	Independent	UK	USA (43%)	East Caribbean dollar	
Turks and Caicos Islands	430	18,122	7,300	Overseas territory of UK	Integrated	UK	USA	US$	
Antigua & Barbuda	442	66,970	8,200	Independent from UK 1981	Independent	UK	USA (27%)	East Caribbean dollar	
Anguilla	91	12,132	8,200	Overseas territory of the UK	Integrated	UK		East Caribbean dollar	
Guadaloupe	1,706	431,170	9,000	Overseas department of France	Integrated	France	France (63%)	French franc, Euro	France
Trinidad and Tobago	5,128	1,169,682	9,500	Independent from UK 1962	Independent	UK	USA (40%)	Trinidad & Tobago dollar	
Martinique	1,060	418,454	11,000	Overseas department of France	Integrated	France	France (62%)	French franc, euro	France
Netherlands Antilles	960	212,226	11,400	Part of the Netherlands	Integrated	Netherlands	Venezuela (35%)	Netherlands Antillean guilder	
Barbados	430	275,330	14,500	Independent from UK 1966	Independent	UK	USA (31%)	Barbadian dollar BBD pegged at 2 per US$	
Bahamas	10,070	297,852	15,000	Independent from UK 1973	Independent	UK	USA (27%)	Bahamian dollar fixed at par to US$	

Virgin Islands	352	122,211	15,000	Territory of the US	Integrated	USA	USA	US$	USA
British Virgin Islands	150	20,812	16,000	Overseas territory of the UK	Integrated	UK	USA	US$	
Cayman Islands	259	35,527	24,500	Overseas territory of the UK	Integrated	UK	USA	Cayman dollar	
Aruba	193	70,007	28,000	Part of the Netherlands	Integrated	Nether-lands	USA (63%)	Aruban guilder	
Indian Ocean (six island economies)									
Mayotte	374	163,366	600	Territorial collectivity of France.	Integrated	France	France (66%)	French franc, Euro	France
Comoros	2,170	596,202	720	Independent from France 1975	Independent	France	France (38%)	Comoran franc	France
Maldives	300	310,764	2,000	Independent from UK 1966	Independent	UK	Singapore	Rufiyaa	
Reunion	2,502	732,570	4,800	Overseas department of France	Integrated	France	France (64%)	French franc, euro	France
Seychelles	455	79,715	7,700	Independent from UK 1976	Independent	UK	South Africa	Seychelles rupee	
Mauritius	1,850	1,189,825	10,400	Independent from Britain 1968	Independent	UK	France (14%)	Mauritian rupee	
Mediterranean (three island economies)									
Malta	316	394,583	14,300	Independent from Britain 1964	Independent	UK	France (19%)	Maltese lira	
Greek Cyprus	5,895	590,314 est	15,000	Independent from Britain 1960	Independent	UK	UK (11%)	Cypriot pound	
Turkish Cyprus	3,355	177,000 est	7,000	Separated from Greek zone 1983	Independent	UK	Turkey (59%)	Turkish lira	
Pacific (21 island economies)									
Kiribati	717	94,149	850	Republic, independent 1979	Independent	UK	Australia	Australian $	
Tokelau	10	1,445	1,000	Territory of NZ	Integrated	New Zealand	New Zealand	NZ $	New Zealand
Tuvalu	26	10,991	1,100	Independent from UK 1978	Independent	UK	Fiji	Australian $	
Vanuatu	12,200	192,910	1,300	Republic, independent from Anglo-French rule 1980	Independent	UK & France	Japan (52%)	Vatu	

APPENDIX A—*continued*

Island	Area km^2	Population	GDP per capita $PPP	Political situation	Political classification	Colonial power	Main import source	Currency	Metropolitan patron if clearcut
Marshall Islands	181	70,822	1,670	Free Association with US 1986	Associated	USA	USA	US$	USA
Solomon Islands	28,450	480,442	2,000	Independent from UK 1978	Independent	UK	Australia (39%)	Solomon Islands $	
Micronesia, FSM	702	134,597	2,000	Free Association with US 1986	Associated	USA	USA	US$	USA
Wallis and Futuna	274	15,435	2,000	French overseas territory	Integrated	France	France (97%)	Pacific Franc	France
Tonga	748	104,227	2,200	Independent from UK 1970	Independent	UK	New Zealand (30%)	Pa'anga	
Niue	260	2,124	2,800	Self-governing in free association with NZ	Associated	New Zealand	New Zealand (59%)	NZ $	New Zealand
Samoa	2,860	179,058	3,200	Independent 1962	Independent	New Zealand	New Zealand (37%)	Tala	New Zealand
Cook Islands	240	20,611	5,000	Self-governing in free association with NZ	Associated	New Zealand	New Zealand (70%)	NZ $	New Zealand
Nauru	21	12,088	5,000	Republic, independent from Australia-New Zealand-UK trusteeship in 1968	Independent	Australia, New Zealand & UK	Australia	Australian $	Australia
Palau	458	19,092	7,100	Compact of Free Association with US entered 1994	Associated	USA	USA	US$	USA
Fiji	18,270	844,330	7,300	Independent 1970	Independent	UK	Australia (41%)	Fiji $	
American Samoa	199	67,084	8,000	US territory	Integrated	USA	USA (62%)	US$	USA
French Polynesia	4,167	253,506	10,800	French overseas territory	Integrated	France	France (53%)	Pacific Franc	France

Northern Marianas	477	74,612	12,500	Commonwealth in political union with USA	Integrated	USA	USA	US$	USA
New Caledonia	19,060	204,863	15,000	French overseas territory	Integrated	France	France (49%)	Pacific Franc	France
Guam	549	157,557	21,000	US territory	Integrated	USA	USA (23%)	US$	USA
Hawaii		1,200,000	34,102	US state	Intergrated	USA	USA	US$	USA

Source: *CIA World Factbook* (2001), plus US Department of Commerce data for Hawaii.

APPENDIX B

Panel data set for Pacific islands economics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	GDP per capita, current prices, converted to US$ at current nominal exchange rate	Real GDP per capita, deflated to 1996 US$ using US implicit GDP deflator derived from International Financial Statistics	Log of real per capita GDP of island economy	GDP per capita of identified core patron economy, current prices, converted to US$ at current exchange rate	Real per capita GDP of core patron economy, 1996 US$	Log of real GDP in core patron economy	Dummy variable for political integration (1) or non-integration (0)	Population of island economy	Core patron economy	Population of core patron economy, 000	Political status of island economy
Variable name		*ISLY*	*LogISLY*		*METY*	*LogMETY*	*DEP*	*Weight*			
Cook Islands 1985	1,608	2,182	7.688	6,944	9,423	9.151	0	17,200	NZ	3,250	Associated
Cook Islands 1990	3,759	4,345	8.377	12,997	15,024	9.617	0	17,000	NZ	3,360	Associated
Cook Islands 1995	5,245	5,347	8.584	16,621	16,943	9.738	0	19,400	NZ	3,660	Associated
Cook Islands 1999	5,020	4,791	8.475	14,561	13,898	9.540	0	16,400	NZ	3,810	Associated
Fiji 1971	466	1,527	7.331	3,440	11,272	9.330	0	530,000	Australia	2,850	Independent
Fiji 1975	1,200	2,997	8.005	6,880	17,185	9.752	0	570,000	Australia	3,070	Independent
Fiji 1980	1,897	3,326	8.109	10,638	18,649	9.834	0	634,000	Australia	3,110	Independent
Fiji 1985	1,637	2,221	7.706	10,549	14,316	9.569	0	697,000	Australia	3,250	Independent
Fiji 1990	1,801	2,082	7.641	18,029	20,839	9.945	0	732,000	Australia	3,360	Independent
Fiji 1995	2,489	2,537	7.839	20,172	20,563	9.931	0	800,000	Australia	3,660	Independent
Fiji 1999	2,249	2,147	7.672	20,773	19,827	9.895	0	810,000	Australia	3,810	Independent
Niue 1999	2,825	2,696	7.900	14,561	13,898	9.540	0	2,000	NZ	3,810	Associated
Tokelau 1999	667	637	6.456	14,561	13,898	9.540	1	2,000	NZ	3,810	Integrated
New Caledonia 1999	15,330	14,632	9.591	24,333	23,225	10.053	1	190,000	France	59,100	Integrated
Kiribati 1976	756	1,787	7.488	4,018	9,499	9.159	1	54,500	Britain	55,890	Integrated
Kiribati 1980	493	864	6.762	9,481	16,621	9.718	0	56,700	Britain	56,330	Independent
Kiribati 1985	332	451	6.112	10,549	14,316	9.569	0	63,900	Australia	15,790	Independent
Kiribati 1990	397	458	6.128	18,029	20,839	9.945	0	72,298	Australia	17,060	Independent
Kiribati 1995	575	599	6.394	20,172	21,011	9.953	0	77,529	Australia	17,850	Independent
Kiribati 1999	555	530	6.272	20,773	19,827	9.895	0	79,000	Australia	18,970	Independent

Marshall Islands 1976	871	2,059	7.630	8,365	19,775	9.892	1	26,990	USA	218,040	Associated
Marshall Islands 1981	824	1,321	7.186	13,618	21,836	9.991	1	32,940	USA	229,940	Associated
Marshall Islands 1985	992	1,346	7.205	17,665	23,972	10.085	1	38,710	USA	238,490	Associated
Marshall Islands 1990	1,545	1,786	7.488	23,217	26,837	10.198	0	44,500	USA	249,950	Associated
Marshall Islands 1995	2,196	2,238	7.713	28,135	28,679	10.264	0	47,900	USA	263,040	Associated
Marshall Islands 1999	1,905	1,818	7.506	34,102	32,549	10.391	0	50,800	USA	272,690	Associated
Federated States of Micronesia 1986	1,273	1,690	7.433	18,501	24,565	10.109	0	85,200	USA	238,490	Associated
Federated States of Micronesia 1990	1,526	1,764	7.475	23,217	26,837	10.198	0	97,600	USA	249,950	Associated
Federated States of Micronesia 1995	1,980	2,018	7.610	28,135	28,679	10.264	0	107,600	USA	263,040	Associated
Federated States of Micronesia 1999	1,874	1,789	7.489	34,102	32,549	10.391	0	116,300	USA	272,690	Associated
Northern Marianas 1999	8,733	8,335	9.028	34,102	32,549	10.391	1	49,000	USA	272,690	Integrated
Guam 1999	20,351	19,424	9.874	34,102	32,549	10.391	1	153,000	USA	272,690	Integrated
American Samoa 1999	4,295	4,099	8.319	34,102	32,549	10.391	1	58,000	USA	272,690	Integrated
Papua New Guinea 1976	574	1,358	7.213	4,018	9,499	9.159	1	2,750,000	Britain	272,690	Integrated
Papua New Guinea 1980	846	1,484	7.302	10,638	18,649	9.834	0	3,010,000	Australia	14,030	Independent
Papua New Guinea 1985	713	967	6.875	10,549	14,316	9.569	0	3,370,000	Australia	14,700	Independent
Papua New Guinea 1990	877	1,014	6.922	18,029	20,839	9.945	0	3,700,000	Australia	15,790	Independent
Papua New Guinea 1995	1,127	1,149	7.047	20,172	20,563	9.931	0	4,070,000	Australia	17,060	Independent
Papua New Guinea 1998	783	759	6.632	20,773	20,124	9.910	0	4,600,000	Australia	18,070	Independent
Solomon Islands 1970	200	656	6.486	2,499	8,187	9.010	1	160,000	Britain	18,730	Integrated
Solomon Islands 1975	341	852	6.747	4,173	10,424	9.252	1	190,000	Britain	55,610	Integrated
Solomon Islands 1980	638	1,118	7.020	10,638	18,649	9.834	0	225,000	Australia	55,900	Independent
Solomon Islands 1985	531	721	6.581	10,549	14,316	9.569	0	273,000	Australia	14,700	Independent
Solomon Islands 1990	589	681	6.524	18,029	20,839	9.945	0	320,000	Australia	15,790	Independent

APPENDIX B—*continued*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	GDP per capita, current prices, converted to US$ at current nominal exchange rate	Real GDP per capita, deflated to 1996 US$ using US implicit GDP deflator derived from International Financial Statistics	Log of real per capita GDP of island economy	GDP per capita of identified core patron economy, current prices, converted to US$ at current exchange rate	Real per capita GDP of core patron economy, 1996 US$	Log of real GDP in core patron economy	Dummy variable for political integration (1) or non-integration (0)	Population of island economy	Core patron economy	Population of core patron economy, 000	Political status of island economy
Variable name		*ISLY*	*LogISLY*		*METY*	*Log-METY*	*DEP*	*Weight*			
Solomon Islands 1994	814	848	6.743	19,026	19,817	9.894	0	370,000	Australia	17,060	Independent
Solomon Islands 1999	643	614	6.420	20,773	19,827	9.895	0	380,000	Australia	17,850	Independent
Tonga 1975	361	901	6.804	4,620	11,541	9.354	0	90,000	NZ	18,970	Independent
Tonga 1980	653	1,145	7.043	7,202	12,626	9.444	0	91,800	NZ	3,070	Independent
Tonga 1985	639	867	6.765	6,944	9,423	9.151	0	94,100	NZ	3,110	Independent
Tonga 1990	1,191	1,376	7.227	12,997	15,024	9.617	0	96,400	NZ	3,250	Independent
Tonga 1995	1,607	1,674	7.423	16,621	17,313	9.759	0	100,000	NZ	3,360	Independent
Tonga 1999	1,520	1,450	7.280	14,561	13,898	9.540	0	105,000	NZ	3,600	Independent
Tuvalu 1981	459	735	6.600	12,024	19,280	9.867	0	7,795	Australia	14,920	Independent
Tuvalu 1985	427	580	6.363	10,549	14,316	9.569	0	8,230	Australia	14,920	Independent
Tuvalu 1990	1,055	1,220	7.107	18,029	20,839	9.945	0	9,050	Australia	15,790	Independent
Tuvalu 1995	1,237	1,261	7.140	20,172	20,563	9.931	0	10,000	Australia	17,060	Independent
Tuvalu 1998	1,378	1,316	7.182	19,461	18,575	9.830	0	10,250	Australia	18,070	Independent
Nauru 1999	7,205	6,877	8.836	20,773	19,827	9.895	0	11,000	Australia	18,970	Independent
Vanuatu 1982	818	1,235	7.119	11,673	17,619	9.777	0	119,980	Australia	18,970	Independent
Vanuatu 1985	940	1,276	7.151	10,549	14,316	9.569	0	129,250	Australia	15,180	Independent
Vanuatu 1990	1,023	1,182	7.075	18,029	20,839	9.945	0	147,300	Australia	15,790	Independent
Vanuatu 1995	1,353	1,380	7.230	20,172	20,563	9.931	0	170,000	Australia	17,060	Independent
Vanuatu 1999	1,232	1,176	7.070	20,773	19,827	9.895	0	200,000	Australia	18,070	Independent

Samoa 1982	689	1,040	6.947	7,474	11,280	9.331	0	157,000	NZ	18,970	Independent
Samoa 1985	534	725	6.586	6,944	9,423	9.151	0	160,000	NZ	3,160	Independent
Samoa 1990	699	808	6.694	12,997	15,024	9.617	0	164,000	NZ	3,250	Independent
Samoa 1994	1,176	1,225	7.110	14,356	14,953	9.613	0	170,000	NZ	3,360	Independent
Samoa 1999	1,391	1,328	7.191	14,561	13,898	9.540	0	170,000	NZ	3,600	Independent
Hawaii 1971	18,170	59,531	10.994	5,435	17,807	9.787	1	771,600	USA	3,810	Integrated
Hawaii 1975	19,580	48,907	10.798	7,571	18,912	9.848	1	886,200	USA	207,660	Integrated
Hawaii 1980	13,872	24,319	10.099	12,274	21,518	9.977	1	968,500	USA	215,970	Integrated
Hawaii 1985	19,228	26,092	10.169	17,665	23,972	10.085	1	1,039,700	USA	227,760	Integrated
Hawaii 1990	28,995	33,515	10.420	23,217	26,837	10.198	1	1,112,900	USA	238,490	Integrated
Hawaii 1995	31,549	32,160	10.378	28,135	28,679	10.264	1	1,178,600	USA	249,950	Integrated
Hawaii 1999	34,512	32,941	10.402	34,102	32,549	10.391	1	1,200,000	USA	260,600	Integrated
Palau 1975	1,450	3,622	8.195	7,571	18,912	9.848	0	10,000	USA	272,690	Associated (US administered UN trust territory)
Palau 1983	2,385	3,462	8.150	15,087	21,905	9.994	0	13,000	USA	215,970	Associated (US administered UN trust territory)
Palau 1990	5,127	5,926	8.687	23,217	26,837	10.198	0	15,000	USA	234,300	Associated (US administered UN trust territory)
Palau 1992	5,606	6,104	8.717	24,744	26,941	10.201	0	16,000	USA	249,950	Associated (US administered UN trust territory)
Palau 1999	5,318	5,076	8.532	34,102	32,549	10.391	0	17,000	USA	255,370	Associated (Compact of Free Association with US)
French Polynesia 1971	2,222	7,279	8.893	3,114	10,202	9.230	1	110,000	France	51,250	Integrated
French Polynesia 1975	4,356	10,880	9.295	6,485	16,198	9.693	1	130,000	France	52,790	Integrated
French Polynesia 1980	8,516	14,930	9.611	12,659	22,193	10.008	1	148,000	France	53,880	Integrated

APPENDIX B—*continued*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	GDP per capita, current prices, converted to US$ at current nominal exchange rate	Real GDP per capita, deflated to 1996 US$ using US implicit GDP deflator derived from International Financial Statistics	Log of real per capita GDP of island economy	GDP per capita of identified core patron economy, current prices, converted to US$ at current exchange rate	Real per capita GDP of core patron economy, 1996 US$	Log of real GDP in core patron economy	Dummy variable for political integration (1) or non-integration (0)	Population of island economy	Core patron economy	Population of core patron economy, 000	Political status of island economy
Variable name		*ISLY*	*LogISLY*		*METY*	*Log-METY*	*DEP*	*Weight*			
French Polynesia 1985	8,165	11,080	9.313	9,625	13,061	9.477	1	170,000	France	55,170	Integrated
French Polynesia 1990	15,264	17,644	9.778	21,441	24,784	10.118	1	197,000	France	56,730	Integrated
French Polynesia 1994	19,609	20,425	9.925	23,294	24,263	10.097	1	215,000	France	57,900	Integrated
French Polynesia 1999	13,645	13,024	9.475	24,333	23,225	10.053	1	230,000	France	59,100	Integrated
Wallis & Futuna 1999	1,689	1,612	7.385	24,333	23,225	10.053	1	15,000	France	59,100	Integrated

Source: Asian Development Bank (2001); IMF; US Department of Commerce data on Hawaii.