Dan People, Xincun Town, Lingshui County, Hainan Island; photo by Wang Jun

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Comparing models of island economic development

GEOFF BERTRAM

Victoria University
Wellington, New Zealand

ABSTRACT

Since the mid-1980s there have been a series of papers classifying small-island economies on the basis of their balance of payments structures — in particular, the sources of financing to cover their cost of imports. This work has focused on the sustainability of economic development, given that small islands are inevitably open economies in which living standards are closely tied to import capacity. The resulting typology introduced three new ideal-types — MIRAB, PROFIT, and SITE — to put alongside the familiar model of export-led development.

There has been less progress made in systematically classifying and quantifying island economies in other dimensions. How much difference does it make which region or ocean an island is located in? How do the historical paths of particular islands during the colonial and post-colonial eras explain differences amongst them? What is the influence of distance from each

island's metropolitan gravitational attractor? Does the form of governance institutions make a systematic difference to economic performance? These are only a few of the questions that can guide future research. The foundations have in many cases already been laid, but much remains to be done.

One conspicuous gap in the small-islands economic modelling to date is the contrast between islands that are located in centripetal, as distinct from centrifugal, regional force-fields. Islands in centripetal regions are subject to strong gravitational forces from adjacent, larger, entities. Those forces produce integrated large units within which small islands tend to become invisible to outside researchers working with global datasets. Examples are Indonesia, the Philippines, the Greek islands, and Hainan in relation to China.

Because of their relative isolation, and hence visibility, islands in centrifugal regions are more easily identified, measured, and classified. Hence it is these more distant satellites of metropolitan core economies that have dominated comparative modelling of island economies. The chapter reflects on the extent to which new data and conceptual frameworks may enable us to extend our existing models to a more comprehensive island universe.

INTRODUCTION

Since the mid-1980s researchers have published a series of papers classifying small-island economies on the basis of their balance of payments structures — in particular, the sources of financing to cover their cost of imports. This research program began with the development of the "MIRAB model" (Bertram & Watters, 1984, Chapters 1, 5, and 16; Bertram & Watters, 1985, 1986; Bertram, 1986, 1998, 2006), which has subsequently been applied, modified, critiqued, and extended by numerous researchers (e.g., Boland & Dollery, 2007; Cook & Kirkpatrick, 1998; Guthunz & von Krosig, 1996; LaPlagne et al., 2001; McElroy & Morris, 1992; Poirine, 1993, 1994; Poirine, 1995, Chapter 4; Poirine, 1998; Tisdell, 2016). More models along the same lines emerged as alternative leading sectors to the remittances-aid combination in the MIRAB model were identified. Guthunz and von Krosig (1996) proposed TOURAB (tourism combined with aid); McElroy (2006) put forward SITE (small island tourism economies); and Baldacchino (2006) introduced PROFIT (people-resources-openness-finance-transport). Both Poirine (1993) and recently Tisdell (2016, p. 434) have emphasized the importance of disaggregating the two components of the MIRAB model: while the migration-remittance nexus brings flows of cash and remittance goods into the household sector of the economy, the aid-bureaucracy channel sustains an expanded public sector, with quite different development impacts.
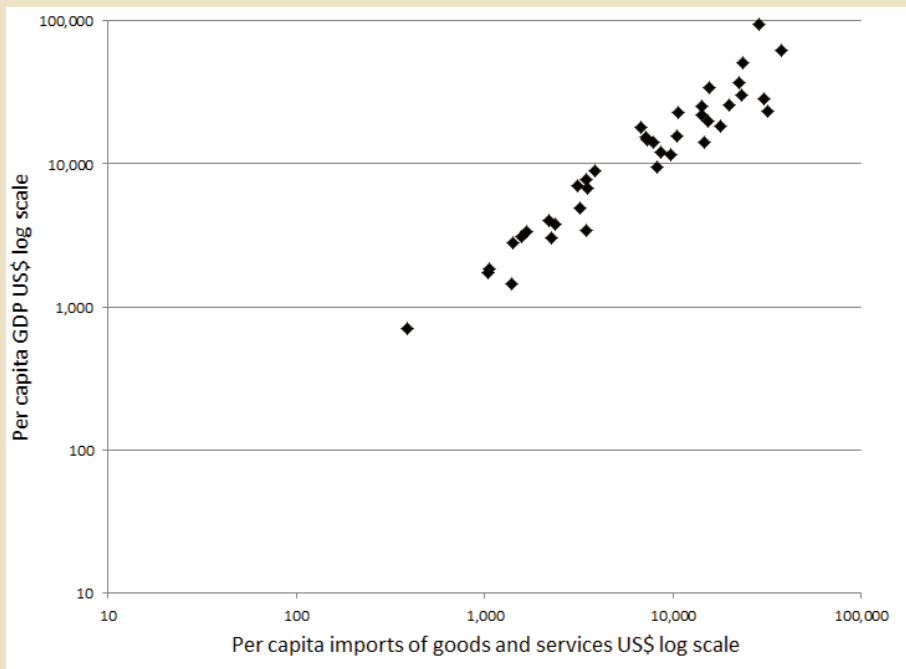
What was common to all of these models was their central motivating question: how are imports financed in small-island economies? This question flowed from the initial insight that in the second half of the twentieth century the small islands emerging from colonial rule were raising their living standards above levels that

could be sustained on the basis of self-sufficiency, in economies that were too small to capture economies of scale in their domestic markets. The provision of modern infrastructure, and of the expanding basket of consumption goods demanded as incomes rose (both processed foods and durables such as motor vehicles, refrigerators, and other electrical appliances), made it essential for the emerging island economies to rely on increasing imports as the foundation of their material standards of living. That meant that they had to secure external funds from some source in order to pay for those import requirements.

MEASURING TRADING OPENNESS

While it is common to suppose that an open-economy development process must be led by exports, in small-island analysis it is best to think of them as import-led economies. The tight link between per capita imports of goods and services and per capita income for small islands is well established; see Figure 2.1. For a typical small-island economy, the goods and services import ratio is 60% ± 10%; for a number, the ratio is over 100%. Causality runs both ways: when external funding is abundant the relationship is simply the Keynesian import propensity driven by income, but when external funding is limited the import ratio operates as the binding constraint on income.

FIGURE 2.1: **Relationship between per capita imports and per capital GDP for 39 small island economies**
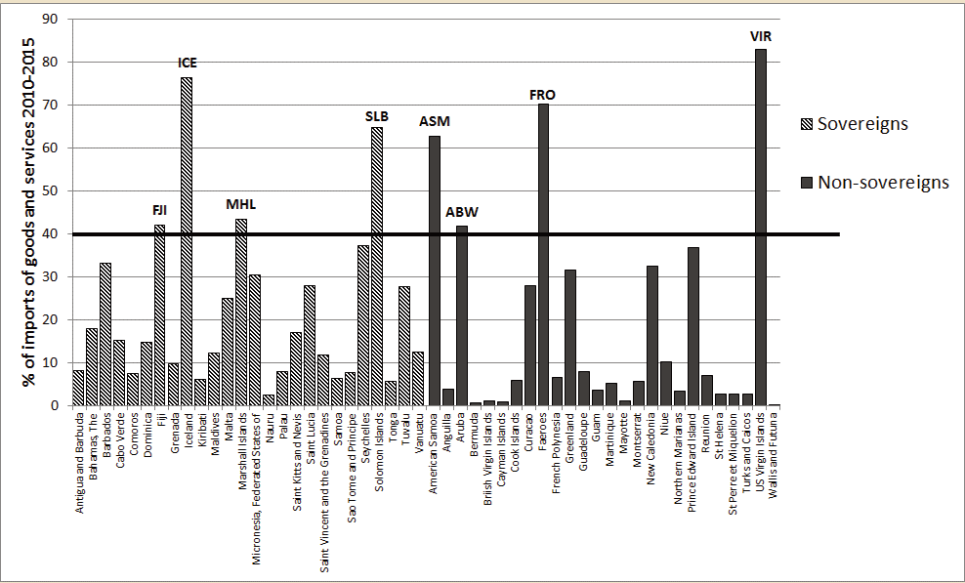

Source: United Nations national accounts database at http://unstats.un.org/unsd/snaama/resQuery.asp, figures for 2015.

Where, then, does the funding come from to pay for imports? In a recent study, Bertram and Poirine (forthcoming, 2018) show that very few of the 53 small islands for which they had data secured more than 40% of their import funding from merchandise exports; see Figure 2.2.

There are certainly some island economies that have managed to raise merchandise exports in line with their merchandise import requirements; see Figure 2.3. But these are outliers relative to the great bulk of the small-island world, which has had widening trade deficits over the past half-century; typical examples are in Figure 2.4.

FIGURE 2.2 : **"Coverage ratio" of merchandise exports relative to imports of goods and services in 53 small-island economies**
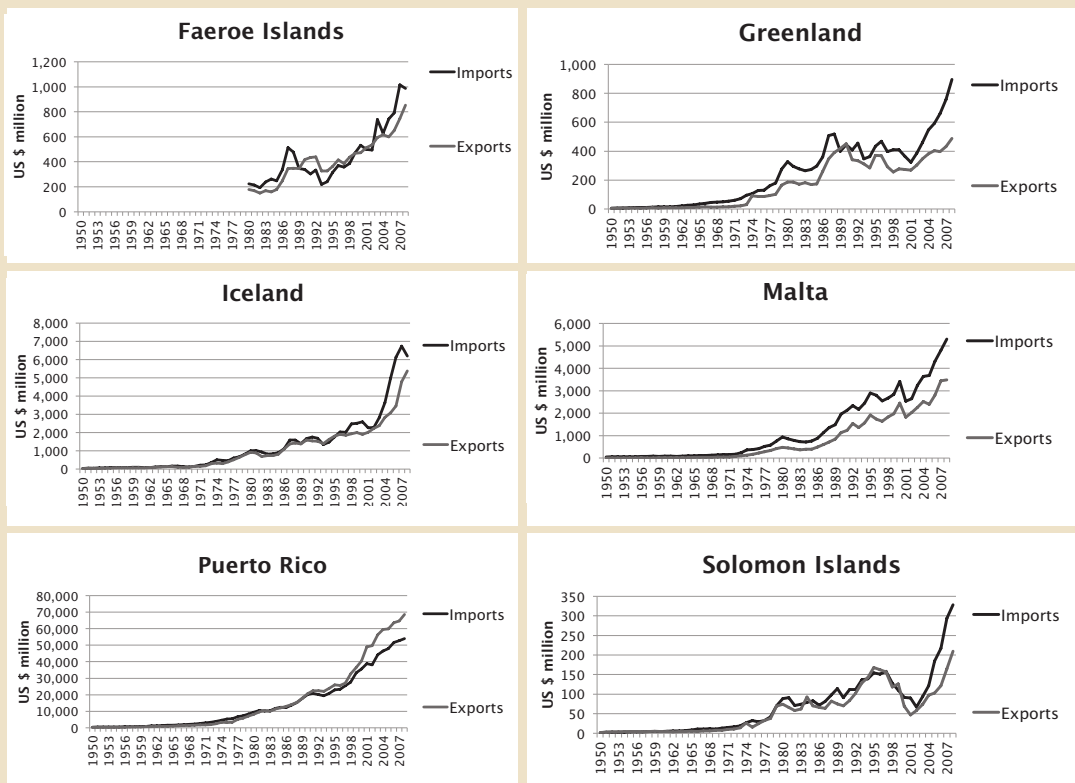

Source: Bertram and Poirine (forthcoming, 2018), Figure 2.5.

What the widely observed excess of imports over exports, persisting over decades, points to, is the importance of non-export sources of external funding.

Before turning to the strategic implications of these widespread and persistent trade deficits in small-island economies, it is worth widening the focus to bring larger island economies into the picture, and to draw some big-picture generalizations about trade ratios. For this purpose the relevant ratios are three: imports divided by GDP, exports divided by GDP, and the second of these divided by the first, which is here labelled "relative export intensity." The imports/GDP ratio is the key indicator of trade openness; the export/GDP ratio is an indicator of export leadership, and the relative export intensity shows the degree to which imports are covered
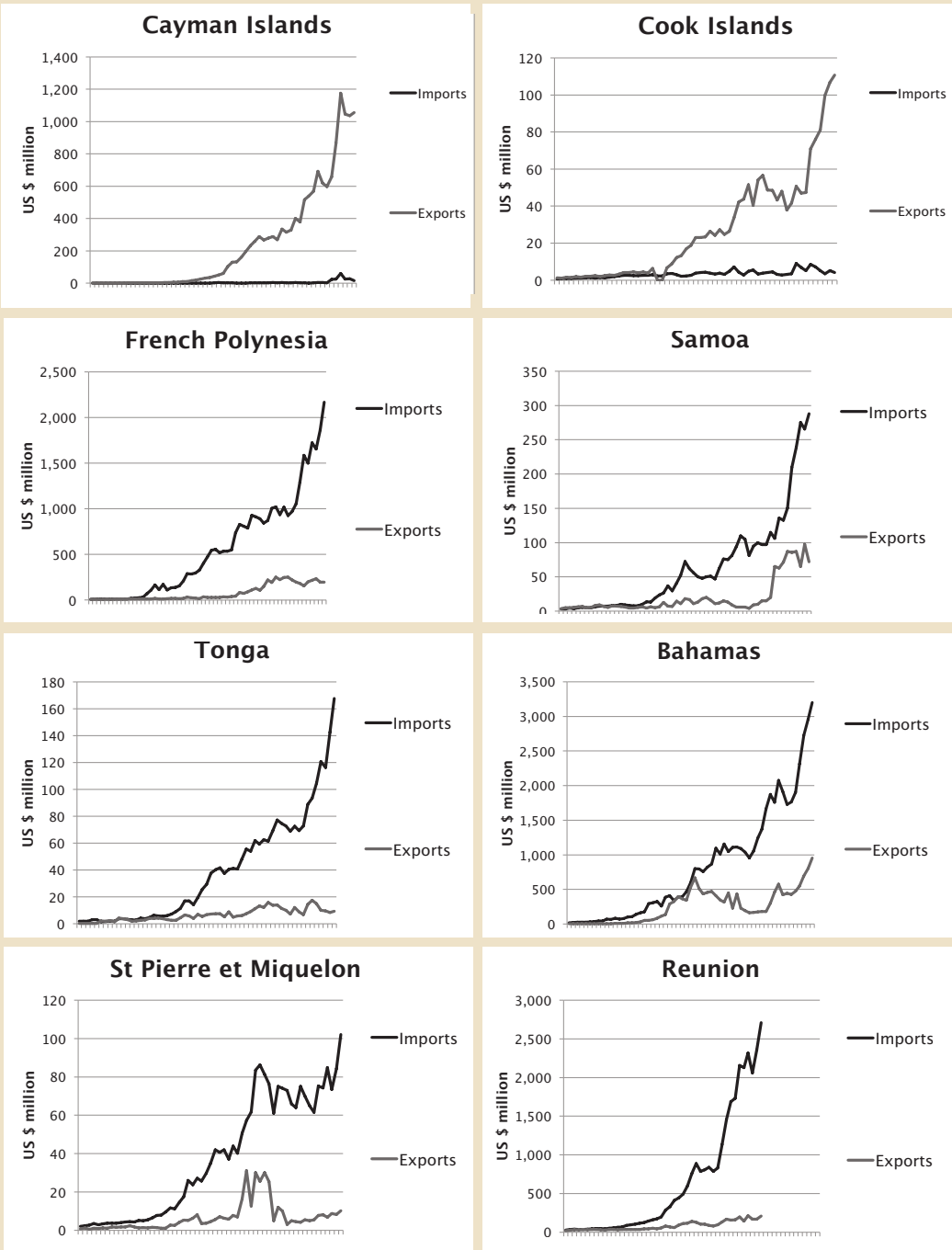
by exports. The ratios are calculated first for merchandise trade only, and then for all trade in both goods and services. The data come from the World Development Indicators online database and are averages for the years 2010–2015. Countries are ranked in ascending order of population size, using 2015 population. The results for merchandise trade are in Figure 2.5, and those for trade in goods and services are in Figure 2.6.

FIGURE 2.3 : **Six small-island economies with (roughly) balanced trade**

Sources: compiled by author from various sources.

FIGURE 2.4 : **The "jaws effect" in merchandise trade: eight small-island economies**

Sources: compiled by author from various sources.

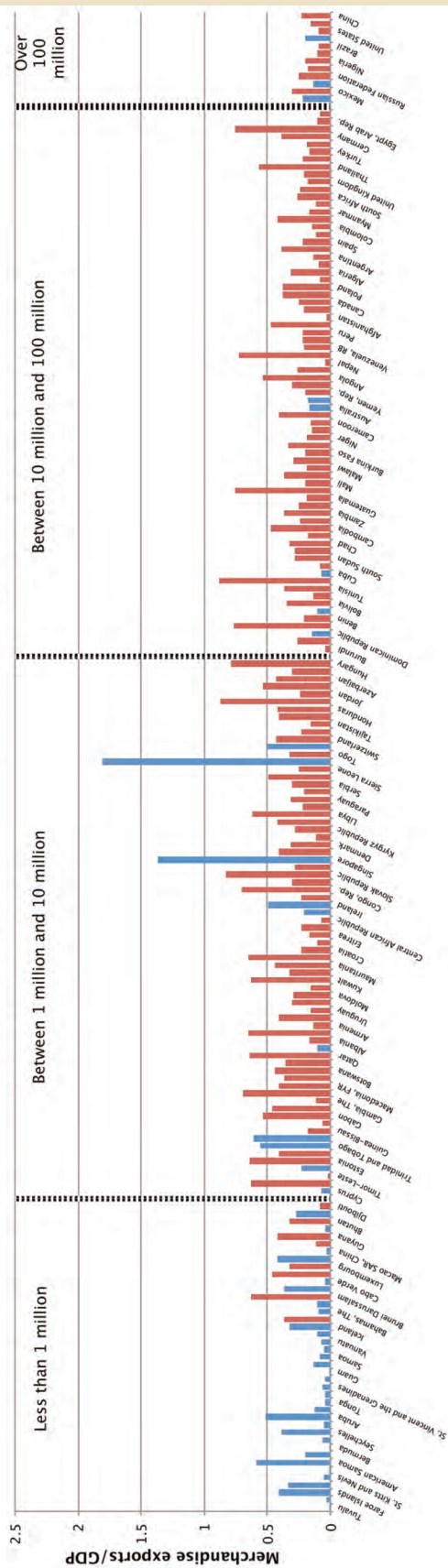From Figure 2.5, over the next three pages, it can be seen that:

- Island economies dominate the small-country population at the left-hand end of the chart.
- Small economies, most of which are also islands, have high-import-ratio economies relative to larger countries. The merchandise import ratio in Figure 5(a) is fairly constant across economies with populations below 10 million but then trends down. In this set of high-import-ratio economies, Singapore and Hong Kong are extreme cases, with import ratios of 1 and 2.2, respectively.
- Turning to the merchandise export ratios, the small islands at the left-hand end of Figure 2.5(b) clearly tend to have the lowest ratios, with just a few small-island economies standing out as successful exporters: Faeroes, American Samoa, Aruba, Iceland, Brunei, Solomon Islands. Above 1 million population, island and non-island economies have comparable ratios, with Singapore and Hong Kong again the stand-out exceptional cases.
- Dividing the export ratio by the import ratio as our measure of export intensity in Figure 2.5(c) brings out a much clearer pattern: there is an upward trend right across the chart, from the small islands with low export intensities at the left-hand end to large economies with higher intensities at the right-hand end. Above 1 million population, there is no obvious difference between islands and non-islands, suggesting that, indeed, "small islands" are significantly different not only from non-island economies but also from larger island economies.

FIGURE 2.5:
**Merchandise
trade ratios for
196 economies**

Source:
Calculated from
World Development
Indicators database

(a) Ratio of merchandise imports to GDP

(b) Ratio of merchandise exports to GDP

Islands ■ Non islands ▮ Population thresholds

Merchandise exports/GDP

Less than 1 million

Between 1 million and 10 million

Between 10 million and 100 million

Over 100 million

(c) Relative merchandise export intensity

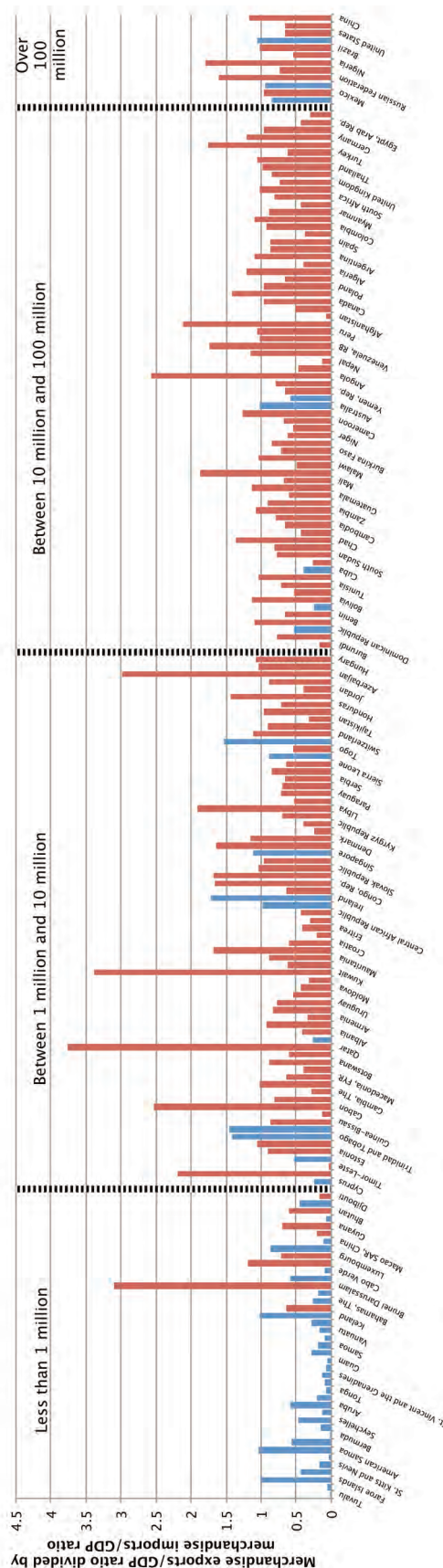■ Islands   ■ Non islands   ▪ Population thresholds

Figure 2.6, over the next three pages, expands the statistical focus from merchandise trade to all trade in goods and services. It shows:
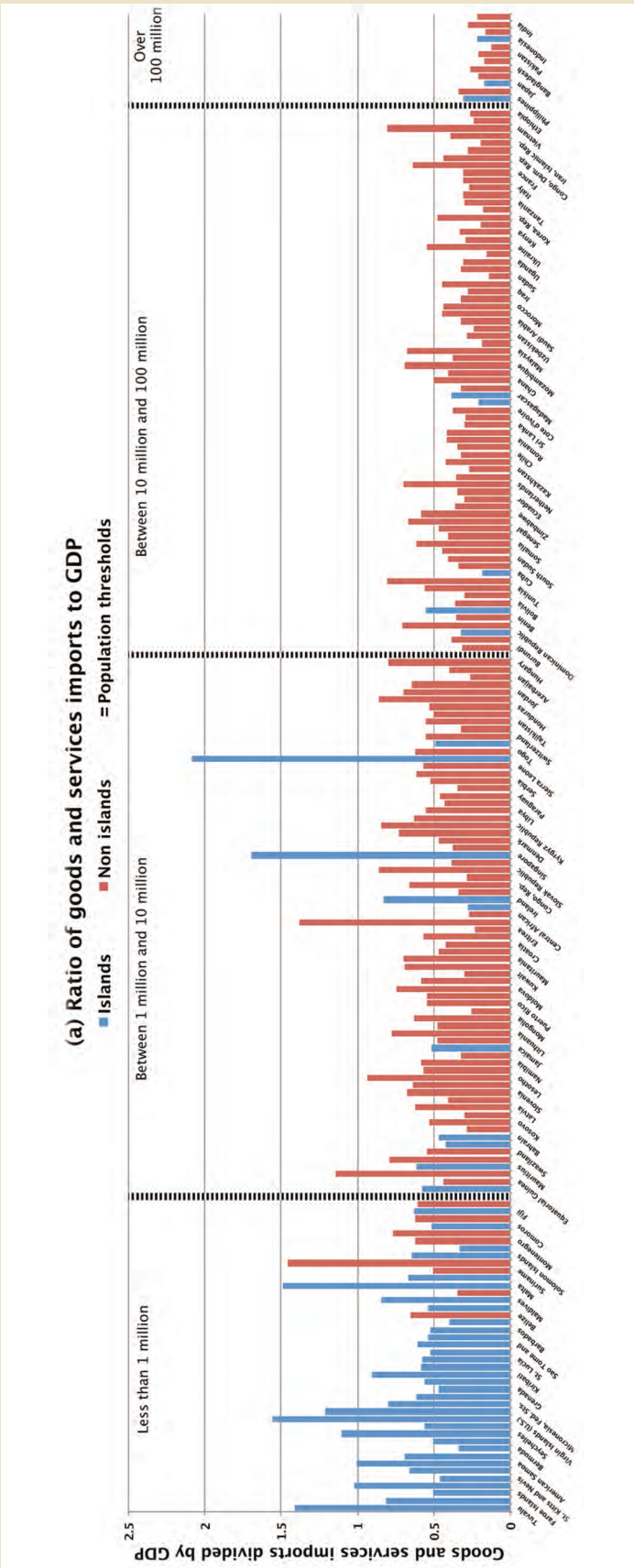
- A strong downward trend in the ratio of total imports to GDP from the small to the large end of the spectrum, from around 0.5 for small islands to around 0.25 for large economies. Island economies provide most of the extreme openness cases, with some ratios of 1.5 or greater for both import and export ratios in Figures 2.6(a) and 2.6(b).

- Export ratios generally trend down from small to large countries in Figure 2.6(b) — except for the small islands at the very left-hand end where a cluster of low ratios appears. Across island economies with less than 10 million population there is, if anything, a positive, not negative, relationship between size and the export ratio.

- Relative export intensity again shows an upward trend across Figure 2.6(c), but the trend is far less clear-cut than in the merchandise-trade picture of Figure 2.5(c), emphasizing the importance of services exports such as tourism. The small-island group generally are below the world average, but the Solomon Islands is an outlier with an export intensity over 2.5.

In both Figure 2.5 and Figure 2.6, small-island economies stand out as generally the most open in the world using the import/GDP ratio, but have very low merchandise exports/GDP ratios and relatively low goods and services export/GDP ratios. This emphasizes the truth of Poirine's (1995, pp. 16–17) point that when measuring the "economic openness" of small islands, it is important not to use the orthodox ratio of merchandise exports to GDP, because in all but a few cases this seriously understates the degree of trade openness. The ratio of goods and services imports to GDP is the best indicator of the exposure of small-island economies (below 1 million) to the outside world. But over 1 million population, distinctions between island and non-island economies become much harder to spot in Figures 2.5 and 2.6. It does look as though "small-island economies" are something of a special category, which means that generalizing from their experience to larger islands cannot be justified simply on grounds of greater "openness."
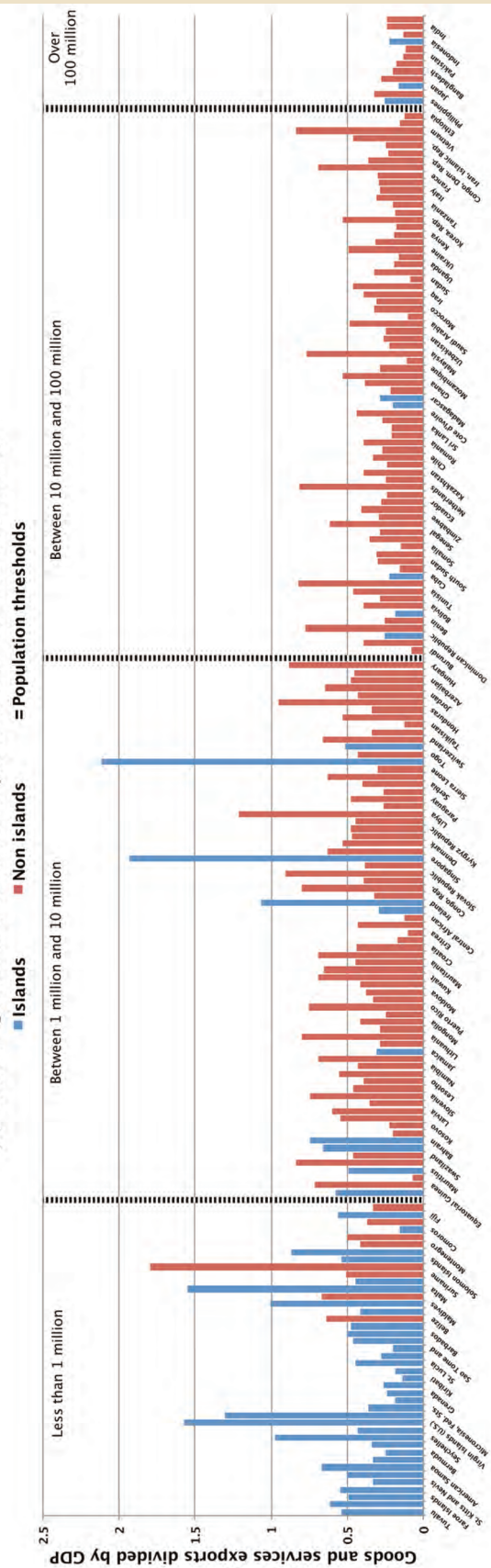
> . . . when measuring the "economic openness" of small islands, it is important not to use the orthodox ratio of merchandise exports to GDP, because in all but a few cases this seriously understates the degree of trade openness. The ratio of goods and services imports to GDP is the best indicator of the exposure of small-island economies (below 1 million) to the outside world.

FIGURE 2.6:
Goods and services trade ratios for 199 economies

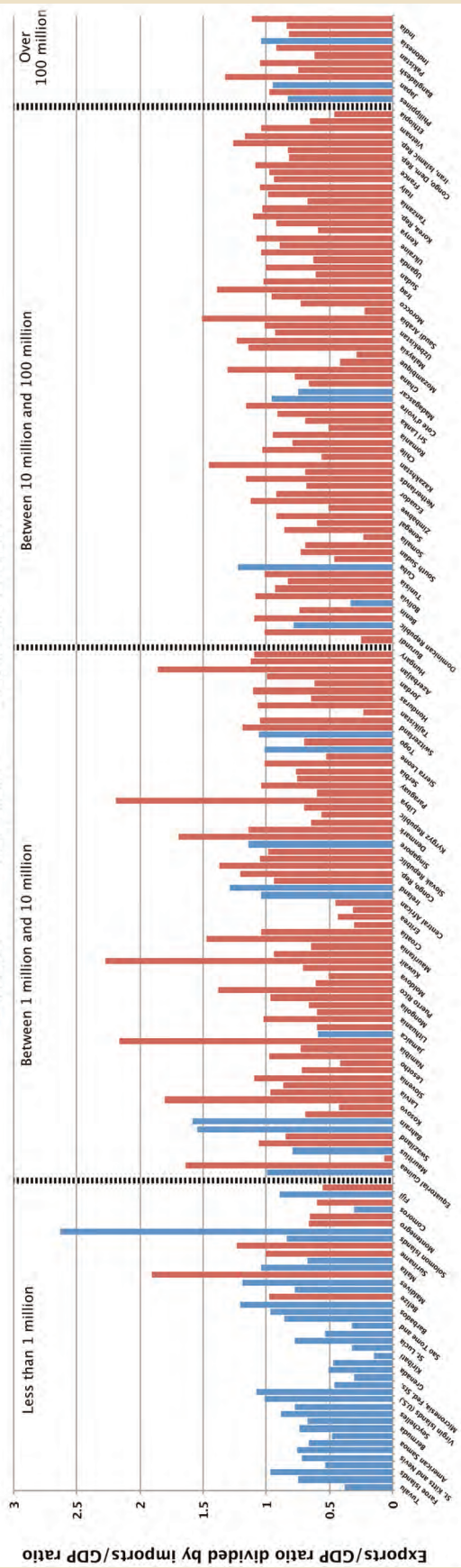Source: Calculated from World Development Indicators database.

(a) Ratio of goods and services imports to GDP

(b) Ratio of goods and services exports to GDP for 199 economies

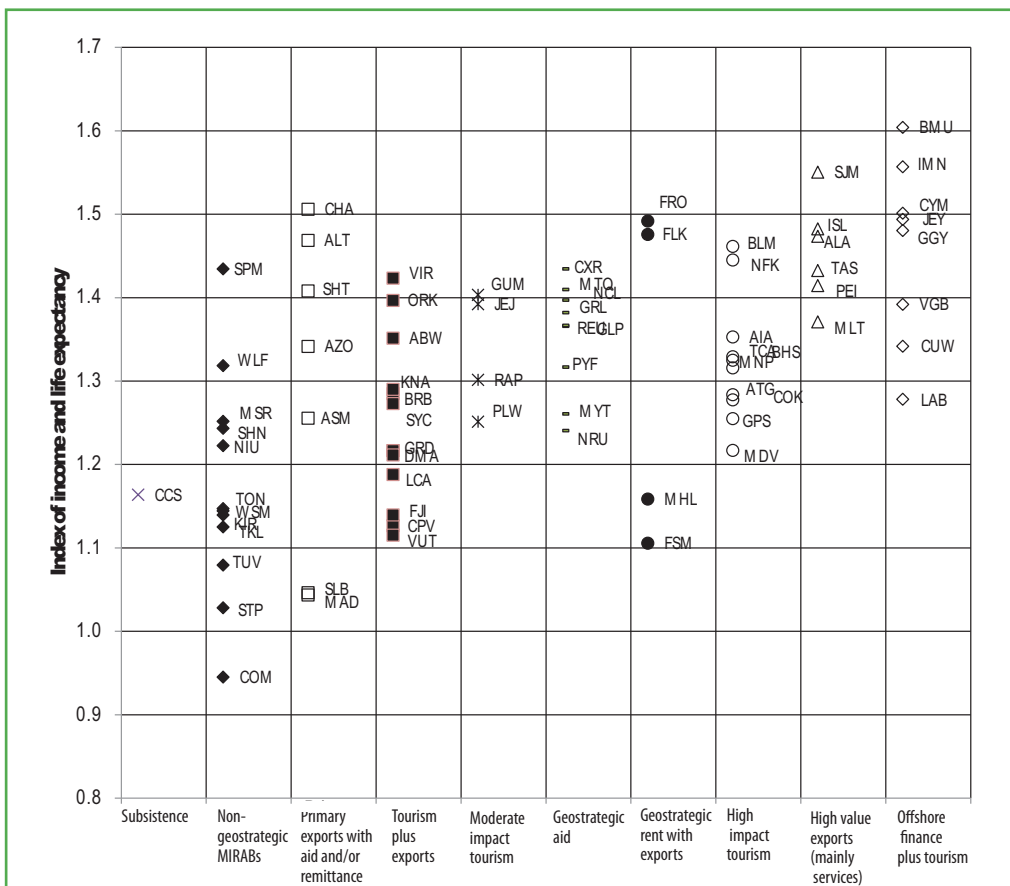(c) Relative goods and services export intensity

MISSING DIMENSIONS

Openness to what?

While the import ratio has provided a convenient and readily accessible measure of openness, it does not in itself provide any distinction amongst widely differing funding strategies. A diagram that crystallizes work from the past three decades is Figure 2.7, taken from Bertram and Poirine (forthcoming, 2018). This chart arranges 74 small-island economies into 10 groups on the basis of the economic development strategies indicated by data on their present-day balances of payments, and ranks these strategies on the basis of an index of income and life expectancy to produce what might seem a clear priority list for policy. But while this may represent the quantitative research frontier, its shortcomings are clear and indicate the need for a more nuanced and probably less quantitatively based approach to island economies. One obvious problem is the cross-section nature of the exercise, which means that strategies are ranked simply on outcomes at a point in time, which means that the chart in itself provides no guidance on the dynamic future possibilities associated with each strategy.

FIGURE 2.7: **Welfare levels and economic strategies for 74 small-island economies**

Source: Bertram and Poirine (forthcoming, 2018), Figure 17.

More importantly, a classification of this sort can be only the first step towards understanding how a particular strategy actually operates in individual island economies, and what exactly is it that each economy has made itself "open" to? Careful comparative case-study analysis is needed before general policy conclusions can be drawn. Baldacchino (2010) is an example of such research that brings out the difficulty of accounting simultaneously for the forest and the trees (cf. Baldacchino, 2010, p. xix). Beyond "the geography of finance," Baldacchino (2010, Chapter 1) emphasizes the determining effect of the differing jurisdictional arrangements that make small islands "sites of agency," and introduces qualitative concepts such as "sanctuary," "quarantine," "prisons," and "piracy," alongside export processing zones, offshore finance centres, and various distinctive varieties of migration and tourism. Economies can be more or less "open," not merely to trade but equally to people, financial flows, geopolitical influences, information, global sport — indeed, any dimension of human activity. In each case, the power of the relationships embodied in the concept of "openness" is mediated by the cost, for any open economy, of accessing resources and participating in global exchange. To be open to tourism, for example, means not just attractive landscapes, visa-free entry, and available accommodation: there must also be frequent and affordable transport links, and a reputation for safety, without which tourism cannot flourish. Similarly, high freight costs to remote locations can eat up a disproportionate share of the scarce funds available to pay for imports at the same time as crippling potential export options (partly accounting for the low export ratios in Figure 2.5[b]. The development of the Internet and broadband access has transformed the ability of small islands to be open to services, as both importers and exporters.

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Openness to where?

One important dimension of openness that has been inadequately studied in the economic literature to date is the distinction between international and within-nation transactions. The export and import statistics arrayed in Figures 2.5 and 2.6 relate to cross-border flows that are visible to the global agencies concerned with international trade, and, as a result, they do not include intra-nation trade. For many of the isolated small-island economies that are identified and recorded in the global

datasets, international trade comprises the bulk of their external transactions. But for the vast majority of the world's small and medium-sized islands, which are fully integrated into larger national economies, the movements of goods, services, people, and finance which drive their local economies are mainly exchanges with the wider national economy, not directly with the outside world beyond the nation's borders. This point is developed further in section 4 below. Here I address briefly the issue of how to approach the analysis of small-island economies that are invisible in the international data.

Consider, for purposes of comparison, Hainan, which, with its 9 million population, lies in the middle of the charts in Figures 2.5 and 2.6, about six places to the left of the 10 million population threshold. Readily available data for 2016 indicate that its merchandise import ratio is 0.15, its merchandise export ratio is 0.03, and its export intensity is 0.23 . These figures would place Hainan alongside most of the small-island economies in terms of its apparent merchandise trade deficit. Meanwhile, the ratio of tourism earnings to GDP in 2015 was 0.14, suggesting that Hainan is more a tourism than a trading economy.

But an important piece is missing from this initial statistical sketch. The trade figures relate only to transactions with the world outside China, while the tourism figures appear to be dominated by Chinese tourists, and figures on other trade with the mainland in goods and services are not easy to find, at least for an outside researcher. As an integral part of the Chinese economy, most of Hainan's external transactions (including its exports of rice and rubber) are with the Chinese mainland economy, not the outside world. As a Special Economic Zone since 1988, Hainan has specialized in bringing in tariff-free luxury imports for sale to tourists from the mainland, making its economy in some respects structurally comparable to the island of Kish in Iran, and, indeed, with other island economies that have leveraged their jurisdictional enclave status to become intermediaries in global supply chains for consumer goods. Hence, in an important sense, Hainan (like Kish) has been a transshipment hub, importing luxuries from the outside world through statistically visible entry points but re-exporting them to mainland China out of statistical view, in the luggage of tourists from the mainland. These re-exports do not appear in any trade statistics because they pass through a retail point-of-sale on the island, and because tourists returning home are not counted as part of the freight transport sector.

Hainan thus may (on the basis of a very casual preliminary review) belong to the category of shopping-tourism economies of the sort seen in the Persian Gulf economies of Dubai, Abu Dhabi, and Kish, and also in the world's international airports, which have managed to carve out island-like jurisdictional enclaves for their duty-free retail operations. Only limited aspects of many of these economies can be captured by the international economic statistics relied on by many outside researchers.

The more jurisdictionally separate an island is, the more the international statistics will reveal its economic structure. The Northern Mariana Islands, for example, as a Commonwealth of the United States, operated for a decade as an offshore export processing zone using low-wage migrant labour from China and the Philippines to produce garments for sale in the US market — a jurisdictional niche that disappeared once the US market was opened to direct supply from China in 2005. Both the migration flows and the entry and exit of goods were visible in global statistics because of the Northern Marianas' isolation and administrative separateness from the mainland US.

In contrast, the economy of Bali, a major tourist destination and agricultural exporter, is not statistically separable from the Indonesian economy without a dedicated research effort. Bali, consequently, has not figured in cross-country islands economic research. The same applies to, for example, Greek islands such as Crete, Rhodes, and Santorini; Mediterranean islands such as Corsica, Sardinia, Mallorca, and Sicily; and, closer to my own home base, the Chatham Islands, which are part of New Zealand, and whose large seafood exports are buried in the national trade statistics, though they can be estimated from other sources (see Jenkins, 2014, Table 6, p. 33).

The whole concept of "openness" is, in fact, not straightforward once one ceases speaking only of nations, whether large or small, and relations among nations. Within a large nation there are successively wider spheres of potential connectedness, starting from the individual and working up through the household, the local community or village, the region or city, the province or state, and so on. At each level is a conceptual boundary or border across which transactions flow more or less freely. The small and medium-sized islands found in cross-country datasets are comparable in scale with a single region or small city in a large economy, but are likely to be less "open" than those counterparts, which generally have easier physical access to other parts of the national territory, freer movement of goods, money, and people, and more immediately shared culture and language. It is in this sense that small islands tightly integrated within nations are generally more "open" than islands that stand alone.

Where islands are separate states within federal nations, as are Prince Edward Island in Canada and Hawai'i in the US, they often have their own statistics, including in the PEI case transactions with the wider nation. That enables them to be readily included in comparative work. Island economies within unitary states are much harder (often impossible) to disaggregate from the national data; examples are Easter Island/Rapanui in Chile, the Galapagos Islands in Ecuador, and most of the Mediterranean and Aegean islands.

SAMPLE BIAS?

The question thus arises: to what extent are all island economies truly represented by the limited number that have made it into the databases utilized by Bertram, Poirine, McElroy, Baldacchino, Feyrer & Sacerdote (2009), and all? In their overview of just three of the world's island regions, Apostolopoulos and Gayle (2002, pp. 3–4) emphasize the sheer scale and diversity of the small-island universe:

> Literally thousands of islands are disbursed throughout the three basins, representing the most renowned insular regions in the world. ... The Caribbean basin, expanding along a coastal arc from Mexico to Brazil, comprises sixteen independent countries, six semi-autonomous Dutch territories, five British overseas territories, three French overseas-departments, a commonwealth associated with the United States, and a US territory. The South Pacific encompasses approximately 25,000 islands and islets, the most known of which are its eleven independent states, three self-governing in free association with the United States, three French overseas territories, two self-governing in free association with New Zealand, two US overseas territories, one territory of New Zealand, one British overseas territory, one commonwealth of the United States, one Australian territory, one Indonesian province, one US state, and one province of Chile. The Mediterranean embraces over 5,000 islands and islets, the most important of which are the large islands of Crete, Sicily, Sardinia, and Corsica (parts of Greece, Italy, and France, respectively); the Aegean and Ionian lands of the Greek Archipelago; the Adriatic islands of Croatia; the Aeolian, Egadi, and Pelagian islands; the islands of the Tuscan and Campanian Archipelago; Ustica; Pantelleria (Italy); the Balearic islands of Spain (Majorca, Menorca, Cabrera, lbiza, and Formentera); and the independent island microstates of Cyprus and Malta.

From this universe of literally thousands of islands, the small-island taxonomies of the past three decades have utilized actual data on only a few dozen, and it may turn out that this small sample is far from representative of the bulk of the world's islands, both large and small. This leads naturally to some reflections on the nature of the sample selection bias inherent in economic work that stops at the boundaries of the available quantitative cross-country datasets.

Samples selected on the basis of data availability clearly privilege a particular type of small island: geographically isolated, away from clustered archipelagos, historically administered as distinct units within the colonial empires, and recognized as autonomous entities (some independent, some affiliated with metropolitan powers) in the post-colonial era. Small islands that are closely enmeshed in larger territorial units, as is the case with islands in the Philippines, Indonesia, and Greek Aegean, have been excluded from the cross-country studies partly for lack of data but

partly also for want of visibility to busy researchers relying on international agencies or the CIA World Factbook to define their island samples.

Equally many of the "islands" in Figure 2.7 are themselves comprised of numerous smaller islands whose individual characteristics are submerged in the island group's figures. It bears recalling that anthropological field work from its very beginnings produced studies of the pre-modern economies of small islands that are invisible in the modern economic writings — Raymond Firth in Tikopia and Malinowski in the Trobriand Islands spring to mind, islands that are submerged in, respectively, the Solomon Islands and Papua New Guinea. (Margaret Mead's American Samoa is the exception rather than the rule.)

Thinking about how one set of islands came to be studied by economists while another much larger set has been ignored, it helps to distinguish between two sorts of regional "force fields." Figure 2.8 contrasts two ways in which the economic dynamics within a region can operate, on the basis of whether the biggest gravitational attraction for trading and policy interactions lies within the region (a "centripetal" dynamic) or outside it (a "centrifugal" dynamic).

THINKING ABOUT how one set of islands came to be studied by economists while another much larger set has been ignored, it helps to distinguish between two sorts of regional "force fields."
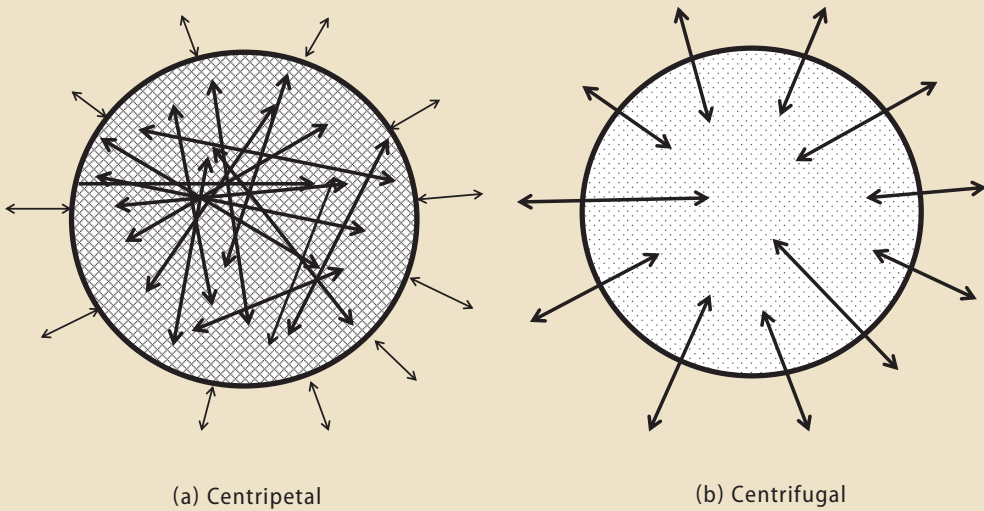
Centripetal non-island regions such as the United States and the EU, along with clustered island archipelagos such as Indonesia and the Philippines, have dense networks of within-region economic interaction, shared history and culture, and consolidated central governing arrangements pursuing common purposes. Regional economic integration follows naturally in that setting, because resource endowments, trading opportunities, and common infrastructure needs, in a setting of large populations, all point to an inward-focused entity held together by strong inward-directed gravitational forces. External transactions with the outside world are secondary, not the prime driving force for the units within the region.

In a centrifugal region, gravitational forces are weak. Each entity within the region relates more directly with countries outside the region than with its geographic neighbours. Regional dynamics are dominated by the trading and political relations of individual units with powerful patrons and partners in the outside world. The islands of the Pacific, Caribbean, Atlantic, and Indian Oceans, on which cross-country economic research has concentrated, all exhibit this centrifugal pattern, especially in regard to their trading relations. These collections of small entities scattered across oceans form "regions" only in the weak geographical sense of shared space, albeit combined in the Pacific and Caribbean with ethnic and cultural affinities. The strong internal gravitational forces that pull continental regions and dense archipelagos with large populations together are missing.

FIGURE 2.8: **Two patterns of economic and political gravitation**

(a) Centripetal   (b) Centrifugal

Islands (or island groups) subject to centripetal dynamics are apt to possess greater jurisdictional autonomy than the components of dense archipelagos, and by virtue of their isolation will face a very different set of opportunities in relation to specialisation and trade. One implication is that merchandise trade, even if only the exchange of agricultural produce amongst neighbouring islands, probably plays a much stronger and more supportive role in centripetal regions than in Bertram and Poirine's (forthcoming, 2018) sample of economies. Another implication is that migrations and remittance patterns will involve the within-nation circulation of ethnically, culturally, linguistically, and citizenship-wise homogenous groups, in contrast to the international migration and remittance patterns seen in centripetal island regions. (This does not mean that external transactions are lacking. The Philippines has been one of the countries most prone to international outmigration, but those migrants appear to identify in their destination economies as Filippino rather than as coming from specific small islands within the archipelago.)

Besides a need to widen the research focus to include more small-island economies in centripetal regions, there is much to be learned from systematically classifying and quantifying island economies in dimensions other than the balance-of-payments figures that underlie MIRAB, SITE, and PROFIT models. How much difference does it make which region or ocean an island is located in? (Gibson and Nero [2008], for example, found a significantly negative "Pacific effect" on levels and growth of income.) How do the historical paths of particular islands during the

colonial and post-colonial eras explain differences amongst them (thinking here not only of statistical indicators of the sort used by Feyrer and Sacerdote [2009] but also qualitative narrative accounts on a case-by-case basis)? What is the influence of distance from each island's metropolitan gravitational attractor? At what point does a gravitational force field become centripetal rather than centrifugal? Does the form of governance institutions make a systematic difference to economic performance? These are only a few of the questions that can guide future research. But most certainly there is a need to distinguish clearly between openness of a national economy, and openness within a national economy.

FREE PORTS AND TRANSHIPMENT HUBS

It seems appropriate to consider briefly some lessons from the remarkable strategic success of two Asian island economies clearly distinguished in Figures 2.5 and 2.6: Singapore and Hong Kong, both of which rank among the world's top container ports and operate global financial and other services hubs, and to ask whether parallel opportunities might apply to Hainan.

The extremely rapid industrial growth of East Asia since the 1970s has gone alongside, and been driven by, the vertical disaggregation of global supply chains, which means that there have been big requirements for port developments that are:

- adjacent to the major manufacturing centres or on shipping routes directly between them;
- possessed of good deep-water harbours; and
- able to take advantage of a historical background of institutional development in trade, finance, and transport.
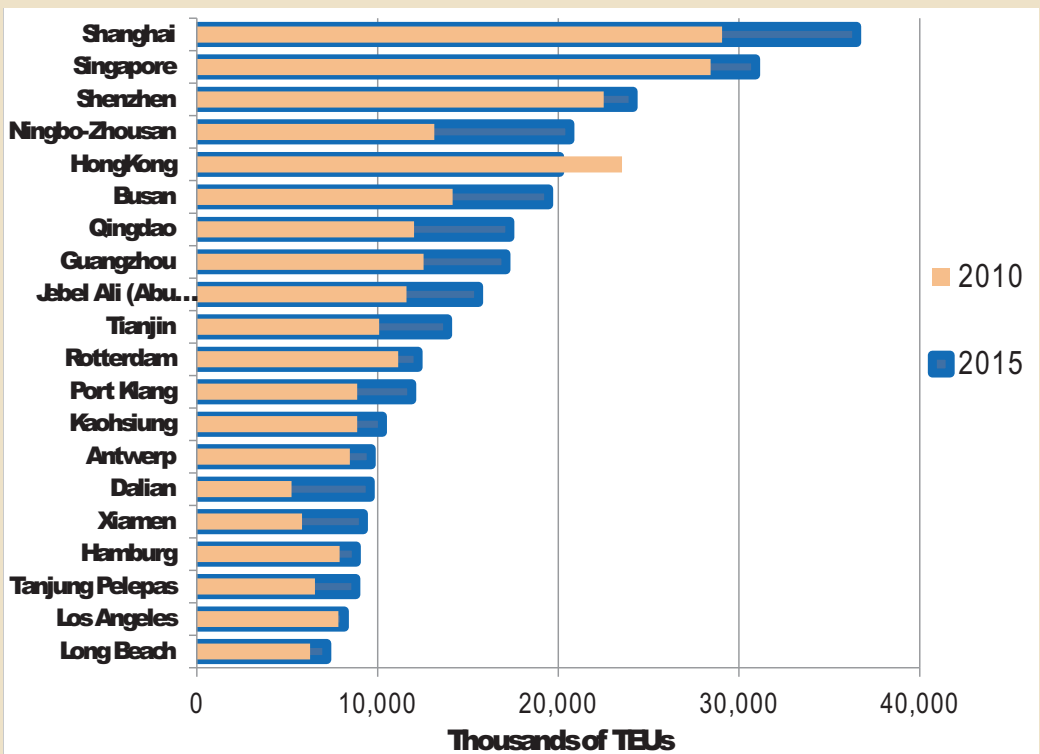
As a result, a major feature of the East Asian economic growth process has been the rise of a few key port cities that combine strong, outward-oriented local manufacturing and service sectors, with locations at key geographical nodes. Major examples are Singapore, Hong Kong, Busan, and Shanghai. Figure 2.9 shows the volumes handled by the world's top twenty container ports in 2010 and 2015; the top eight are all in East Asia, with Singapore and Hong Kong ranked second and fifth respectively. Hong Kong is the only one of the twenty to show falling volume since 2010.

The fact that Singapore and Hong Kong are islands immediately adjacent to large landmasses has contributed to their success. As islands, they are open to waterborne traffic coming from multiple directions, while, as distinct "offshore" jurisdictions with considerable autonomy over the past half-century, they have been able to deploy the institutional arrangements of export processing zones and tariff-free zones to lure international capital to invest in the local economies. Because movement of goods entering and leaving their territories takes place across water and hence is easier to detect and monitor than land-carried traffic, islands are particu-

larly well-suited to freeport operations of the sort developed most notably by Singapore (with the obvious proviso that Singapore has a land connection via its causeway). And, perhaps most important of all, those two islands' locations made them key strategic outposts of the British Empire in its heyday, leaving a legacy of institutions and international network linkages.

The extreme international openness of Singapore and Hong Kong enabled these two island economies to take full advantage of a particular historical conjuncture of the late twentieth century. By providing the transportation hubs to connect global manufacturing supply chains, Singapore and Hong Kong were able to achieve rapid growth far in excess of what their local manufacturing sectors could have sustained on a stand-alone basis.

FIGURE 2.9: **Twenty biggest container ports in 2015, with 2010 comparison**

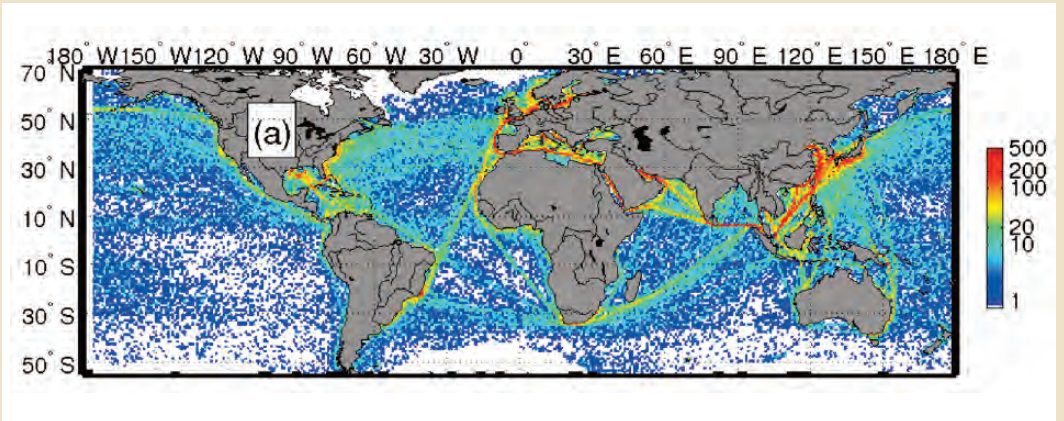Source: https://en.wikipedia.org/wiki/List_of_busiest_container_ports, accessed 20 October 2017.

The fact that these very successful transhipment ports and tariff-free zones are located on islands does not, however, mean that entry into this field is easy for any island. The basic components of success in the strategic development of Singapore and Hong Kong were:

- location (fundamental, e.g., for transhipment operations);
- history (Singapore and Hong Kong have centuries of trading development behind them and built up to a critical mass of integrated services over a long period);
- first mover advantage; and
- stable political arrangements that are attractive to outside capital and provide security from corruption and expropriation.

With regard just to geography, satellite data shows how the location of the giant port cities relates to the shipping routes of the early twenty-first century. Figure 2.10 shows the number of ships detected by satellites worldwide over the period 1992–2012, and Figure 2.11 shows a close-up of the Asian part of this map, with data grouped into one-degree pixels. What the plots clearly reveal is that the existing major ports such as Singapore, Hong Kong, Shanghai, Qingdao, Kaohsiung, and Busan all lie on dense shipping lanes, whereas Hainan is conspicuously off to one side. That means that Hainan, in common with the Philippines and the northern Japanese islands, is not well located to enter the global transhipment and bunkering trade that is the mainstay of Singapore, Hong Kong, and the other major ports up the Chinese and South Korean coasts. Reinforcing this conclusion is the fact that the global economy has probably now reached "peak manufacturing" which leaves the first-mover ports in command of a maturing transhipping sector.
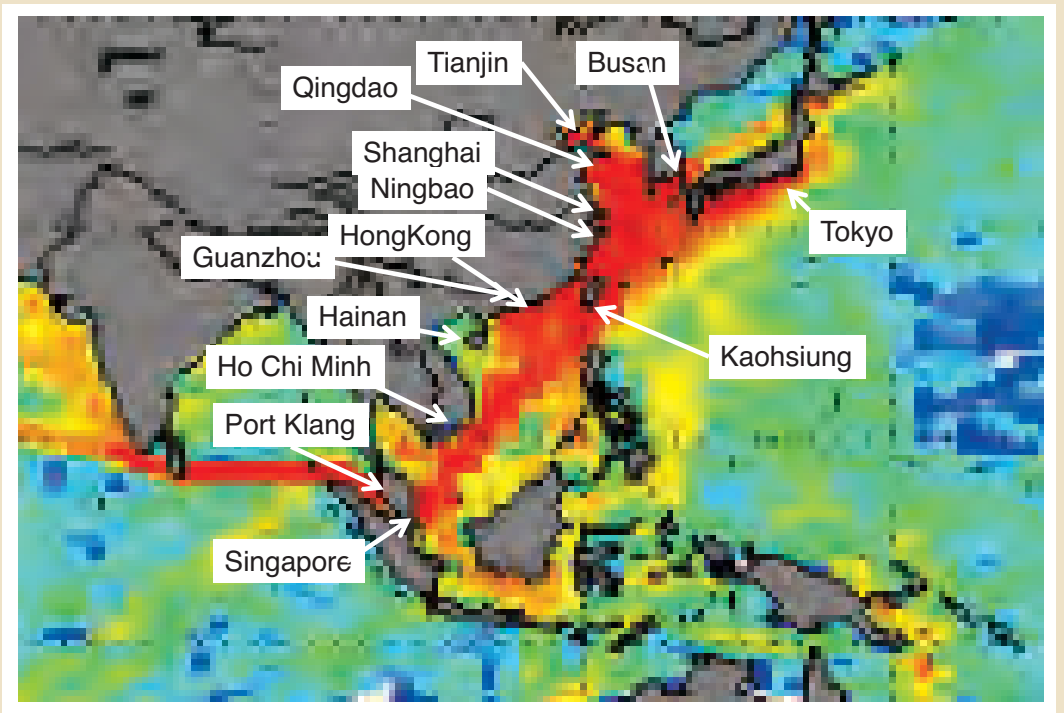
Hainan, in other words, is not likely to become another Singapore or Hong Kong. Its economy is oriented within-nation towards mainland China rather than outward to the global economy, and it is from the mainland that the flows of funding come to sustain its consumption and imports. Because transfers occur more freely within a nation than between nations (including central government transfers of purchasing power and resources across the national space), island economies such as Hainan that are within-nation do not face the external funding constraint that more autonomous, internationally exposed small islands do, and the mechanisms by which resources of finance, technology, transportation, and infrastructure access are secured are quite different from those of, for example, Cuba or Cyprus. By the same token, the degree of exposure to global cyclical instability is much reduced by the fact of being embedded within a national economy through which international shocks must pass before impacting the island economy, while nation-specific shocks become relevant for policy in a way that does not apply to independent or highly autonomous stand-alone small-island jurisdictions.

FIGURE 2.10: **Satellite data on ships detected worldwide, by one-degree pixels, 1992–2012**

Source: J. Tournadre, "Anthropogenic pressure on the open ocean: the growth of ship traffic revealed by altimeter data analysis," Geophysical Research Letters 41(22): 7924-7933, November 2014, Figure 1(a) p.7927.

FIGURE 2.11: **Close-up of Asian region satellite data on ships, 1992–2012**

Source: J. Tournadre, "Anthropogenic pressure on the open ocean: the growth of ship traffic revealed by altimeter data analysis," Geophysical Research Letters 41(22): 7924-7933, November 2014, Figure 1(a) p.7927.

Night traffic lights inside of the Garden
Bridge of China, Hainan Island

CONCLUSION

The economic research program that began in the 1980s with the MIRAB model, and with George Marcus's (1981) conception of migrant diasporas as a form of transnational corporation, has now matured and reached what seems to be the point of diminishing returns. New lines of comparative island-economy research will now push into the less well-charted universe of islands in high-gravity centripetal locations, bringing their island-specific data into clearer focus, and studying to what extent this process reinforces or modifies the lessons drawn from the study of the dispersed, centrifugally linked islands that have dominated the research sample to date.

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