

The ADRI-Sustineo Pacific Index: Background Technical Paper*

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Abstract

This paper provides background details on the design and application of the ADRI-Sustineo Pacific Index. A joint initiative of the Alfred Deakin Research Institute (ADRI) and Sustineo Pty Ltd, and adapted from the Center for Global Development's Commitment to Development Index, the Pacific Index scores and ranks rich country support for development in the Pacific based on actions in the following areas: (i) foreign aid; (ii) trade; (iii) finance; (iv) migration; (v) the environment; (vi) security; and (vii) technology. Various weights are assigned to the components of the index. The main finding is that New Zealand ranks first, indicating the highest level of commitment to development in the Pacific region.

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1. Introduction

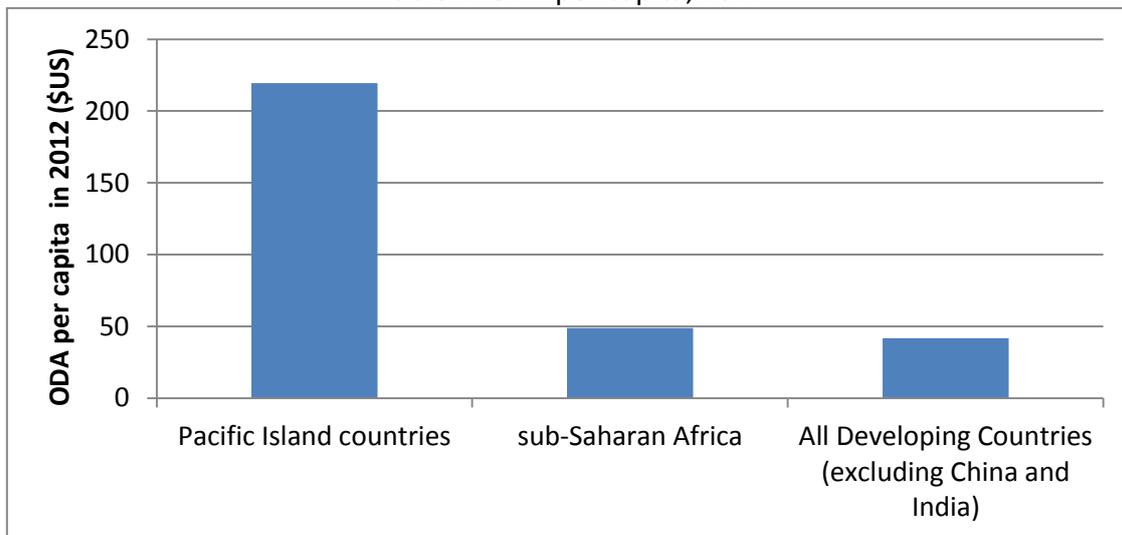
Pacific Island countries provide many benefits to their citizens, but face a number of profound development challenges. For decades they have recorded the lowest and most volatile rates of per capita economic growth of any region in the world, the ease of doing business has in almost all Pacific Island countries declined relative to other countries over recent years, progress towards the Millennium Development Goal (MDG) of halving income poverty is the worst of all regions in the world with only two countries (Cook Islands and Niue) on track to achieve this goal, and there are widespread concerns for the control of diseases (including HIV/AIDS) within the region (McGillivray et al., 2010, World Bank, various years, Pacific Islands Forum Secretariat, 2013, United Nations, 2013). These facts are striking in their own right. They are even more striking given that foreign development aid has doubled since 2002, with many Pacific Island countries having received some of the highest amounts of this aid relative to GDP and population in the world (Pacific Islands Forum Secretariat, 2013, World Bank, 2014). The Pacific Island countries as a group has certainly received comparatively enormous amount of per capita official development assistance (ODA). As Table 1 shows, in 2012 it received in per capita terms more than 4.5 times the amount of ODA per capita receipts of sub-Saharan African and All Developing Countries (excluding China and India).

Two points emerge from the preceding facts. The first is that rich countries need to do far more for the Pacific Islands (above and beyond what these countries do for themselves) to address the development challenges they face. They need to take actions in key policy areas that are crucial to growth and development in the Pacific. It is in their own self-interests to do so, but also consistent with the very principles on which efforts such as the MDGs are based. The second is that these efforts need to go well beyond foreign development aid. They must extend to other known drivers of growth and development.

The ADRI-Sustineo Pacific Index is built on both recognitions. An adaptation of the Center for Global Development's well-known and influential Commitment to Development Index (CDI), the Pacific Index is an empirical device that identifies and gives due credit to those rich donor countries that display the greatest commitment to development in the Pacific based on their actions in seven key policy areas, including aid. Conversely, it also

shows which countries are doing the least, highlighting the policy areas in which they do particularly poorly relative to others.¹ This information is shown primarily in the form of a league table, which ranks rich countries in terms of their efforts to support development in Pacific Island countries. This information is not merely of analytical interest, but provides a basis for policy advocacy, holding rich countries to account for their often repeated public commitments to support development in poor countries, in this case in the Pacific.

Table 1: ODA per capita, 2012



Source: calculated using data from (OECD, 2014a) and World Bank (2014).

The Pacific Index ranks rich countries on the basis of their efforts in supporting development in the following fourteen sovereign nation states in the Pacific: Cook Islands, Fiji, Kiribati, the Marshall Islands, the Federated States of Micronesia, Palau, Nauru, Niue, Tuvalu, Samoa, Tonga, Papua New Guinea, the Solomon Islands and Vanuatu. The ‘rich’ countries in question are the 27 members of the OECD Development Assistance Committee. These countries are identified in Figure 1 below. A major omission from our investigation is China, which is a major player in the region. This is unfortunate, but unavoidable owing to a lack of requisite data. Such is the lack of data it is not even possible to provide an informative estimate of the Pacific Index, or of any of its individual components, for China.

¹ The CDI rates rich countries for their global support for development. It is applied to regions, but not specifically to the Pacific, nor is it tailored to specific developing country groups. Details of the CDI can be found in Roodman (2013).

2. The Pacific Index

The Pacific Index combines empirical information on OECD country efforts that support Pacific Island countries in the following policy areas, each of which are crucial for growth and development of the latter:

1. aid;
2. trade;
3. finance;
4. migration;
5. the environment;
6. security; and
7. technology.

The index is a composite indicator that aggregates information on OECD efforts in these areas. This information is captured by seven components, one for each of the seven policy areas. The aid, trade and migration components are adapted from the CDI, being tailored specifically to support for Pacific Island countries. The finance, environment, security and technology components are taken directly from the CDI, without modification, and are not therefore specific to the Pacific, reflecting the global public good orientation of actions in these policy areas.² These components are discussed below, followed by key comments on how to interpret Pacific Index scores.

Aid

Good quality foreign aid can be an important driver of economic growth and related development achievements, such as higher levels of health and education and lower levels of poverty. The *foreign aid component* takes into account the quantity and quality of official development assistance (ODA) provided by donors.³ The quantity of aid is measured relative

² Full details of the actual calculation of the finance, environment, security and technology components can be found in Roodman (2013). Readers should consult this reference if they require more information on the workings of each component of the Pacific Index and data sources on which they are based. It should be noted, however, that the Pacific Index aid component differs from that of the CDI in one respect, which is outlined below.

³ It is occasionally claimed that foreign aid is not a solution, partial or otherwise, to Pacific challenges but part of the problem, actually retarding development in the region. There can be no doubt that many aid activities have not worked well in the Pacific. As such there is a ring of truth to these claims, that they are in part correct. But in looking at the totality of official development aid efforts there is considerable evidence to suggest that on average the development situation of the Pacific would be worse in the absence of aid, judging from its impact on per capita economic growth. See, for example, Pavlov and Sugden (2006), Feeny (2007) Jayaraman and Lau (2009) and Feeny and McGillivray (2010). These studies find that growth in the Pacific would over recent decades been lower in the absence of aid.

to donor country GNI, reflecting donor effort or commitment. Debt forgiveness relating to previous non-concessional office lending is excluded. The aid component rewards rich countries for the level of ODA to the Pacific measured as a ratio of donor GNI and the share of donor aid going to countries with high governance levels relative to their income per capita, and penalises them for the extent of aid tying (to the purchase of donor goods and services) and the extent of project proliferation relative to the governance levels of the recipient countries in question.

Tied aid is discounted by 20 per cent and partially untied aid by 10 per cent. Foreign aid is then discounted if it goes to richer more corrupt countries (using selectivity weights from Roodman (2013)). Emergency aid is exempted from both poverty and selectivity discounting and aid that is provided to improve governance is exempted from the governance discount. While Roodman (2013) adopts an aid project size adjustment to penalise donor project proliferation, the Pacific Index uses a simpler adjustment which penalises donors for the number of projects they undertake in a Pacific recipient. A larger penalty is applied for providing a large number of aid activities to recipients with lower levels of governance.⁴

Quality adjusted aid quantities are summed across recipients to provide a total for each bilateral and multilateral aid donor. Following Roodman (2013), the quality-adjusted aid to the Pacific from multilaterals is then allocated back to bilaterals in proportion to the bilaterals' net contributions to the multilaterals during the year in question.

Private individual contributions to charitable organisations are not included. While included in the aid component of the CDI, there are not sufficient data available to accurately determine the extent that private charitable giving to the Pacific can be accredited to government policy.

Trade

Providing developing countries with fair and open access to markets in developed countries is crucial if the former are to sustain higher rates of economic growth. The *trade component* is based on the recognition that the taxing of imports and subsidisation of

⁴ The penalty is calculated using the following formula: $(\text{number of activities/governance multiplier})^{-0.06}$.

domestic producers is harmful to developing country exporters. This component of trade policies gets a weight of 75 per cent and is based on an aggregate measure of protection (AMP). This estimates the combined effect of tariffs, non-tariff barriers and domestic production subsidies on an ad valorem tariff-equivalent basis. The second component is based on the level of imports from Pacific countries as a share of rich country GDP, weighted by the income per capita of the exporting country. This component receives a weight of 25 per cent. Data come from IMF (2014).⁵

Finance

It is widely acknowledged that investment, under certain conditions, is an important driver of development.⁶ Following the CDI, the *finance component* rewards rich country policies that are likely to lead to productive investment, including whether they offer political risk insurance to investors, tax policies that prevent investors from being taxed both at home and in the host country, and whether they support international agreements to control corruption (such as the Extractive Industries Transparency Initiative). This scorecard receives a weight of 50 per cent. The index penalises countries for financial secrecy, recognising that allowing foreign persons to engage in secret financial transactions facilitates a host of harmful activities including tax avoidance and evasion, corruption and the trafficking of guns, drugs and people. This financial secrecy component also receives a weight of 50 per cent.

Migration

Migration is crucial to growth and development in the Pacific. It provides immigrants with greater access to employment opportunities and higher wages. Allowing people to move for work enables them to send money (remittances) back to families and friends in their home country. Migrants sometimes return home with skills gained abroad, outweighing drain effects. The *migration component* rewards rich countries for the inflow of migrants from Pacific countries relative to the GDP of the former and for openness to their students and asylum seekers from them.

⁵ In the most recent CDI, this has been replaced with two indicators receiving a weight of 12.5% each. The first is a measure of administrative barriers to goods importation, drawn from the World Bank's Doing Business surveys. The other is an index of restrictions on services imports, also from World Bank researchers.

⁶ Recent research finds that a 10 per cent increase in FDI in Pacific Island countries is associated with a 0.1-0.4 per cent increase in their GDP growth. See Feeny et al. (2014a).

Specifically, the three components are as follows. First, the gross immigrant inflow divided by receiving country population (weighted to reflect the poverty of sending nations in the Pacific). Data are from the OECD (2014b). This component gets a weight of 65%. Second, the share of foreign students from Pacific countries as a share of the total from non-DAC countries (with a weight of 15%) using data from the OECD (2014c).⁷ Third, a UNHCR index including the number of refugees taken domestically, the number of other people of concern to UNHCR such as internally displaced people and the number of asylum applications taken (all divided by GDP) with a weight of 20% (taken from the CDI).

Environment

The Pacific is highly vulnerable to the impacts of climate change, threatening land, food security, and water supplies. Taken from the CDI, the environment component of the Pacific Index contains indicators in three major areas: global climate (weighted 60 per cent); fisheries (weighted 10 per cent); and biodiversity and global ecosystems (weighted 30 per cent). Specific indicators include greenhouse gas emissions and fuel production per capita; annual change in emissions; gasoline taxes; consumption of ozone depleting substances per capita; Kyoto protocol ratification; fishing subsidies; UN Fisheries Agreement ratification; biodiversity treaties participation; and tropical timber imports per capita. Each of these indicators is assigned a 5 per cent, 10 per cent or 15 per cent weight.

Security

Links between security and development are well established: development is hard to achieve in insecure environments. Rich countries can improve security in developing countries by providing peace keeping forces and protecting trade routes but they can also jeopardise security through the provision of military hardware (Roodman, 2013). Following the CDI, the *security component* measures: (i) countries financial contributions to UN and NATO peacekeeping operations and humanitarian interventions as well as for spending on the protection of sea lanes (weighted 50 per cent); (ii) participation in international security regimes which promote non-proliferation, disarmament and the international rule of law (for example, the Comprehensive Test Ban Treaty, the Ottawa Convention on land mines

⁷ Following the CDI, total non-DAC foreign students is used as the denominator rather than total population. The reason is that language can play an important non-policy barrier in education. This is particularly true for Japan (see Roodman, 2013).

and the International Criminal Court) (weighted 25 per cent); and (iii) a penalty for the value of arms exports to undemocratic nations (weighted 25 per cent).

Technology

Technological improvements such as the internet, mobile phones, vaccines, high yielding grains were all invented in rich countries and have been of great benefit to those in developing countries, including those in the Pacific. Mobile telephones have had many benefits throughout the region. Some are of less benefit such as the motor car leading to pollution and congestion. The *technology component* of the Pacific Index is taken from the CDI and seeks to reward governments for (i) the generation of technology (weighted 67 per cent) and (ii) its diffusion (weighted 33 per cent). The index rewards government subsidies for R&D whether delivered through spending or tax breaks while discounting military R&D by half. Policies on Intellectual Property Rights (IPRs) such as patent laws which inhibit the flow of innovations are also accounted for.

While strong protection of intellectual property rights can assist in encouraging innovations which benefit developing countries, Maskus (2005) argues that some forms of protection do more harm by restricting the flow of innovations that have been created. Based on this the technology component includes the following indicators: R&D expenditure, discounted according to its sector; tax incentives for private R&D; penalties for patent coverage on plant and animal species and software innovations, lack of limitations on patent rights, IPR extensions.

Interpreting the Pacific Index

We need to be very clear as to how the Pacific Index is interpreted. It indicates rich country *efforts* in supporting development in the Pacific. Put differently, it indicates rich country commitment to development in the Pacific. It is for this reason that in the aid, trade and migration components, flows relative to rich country GNI are used in the index design. Larger economies have a greater capacity to provide aid and to absorb imports and migrants. Effort is an increasing function of the ratios of these flows to GNI. It is assumed that efforts with respect to the other variables on which the Pacific Index is based are largely independent of GNI.

3. Pacific Index: Aggregation, Scaling and Weighting

Our attention now turns to combining the information provided by each of the seven components, on how an overall index score is assigned to each OECD country. There are many ways this can be done, on how composite indices can be formed and calculated. Simplicity and ease of interpretation primarily were prime guiding principles for the Pacific Index, with it formed by taking the arithmetic mean (average) of its seven components. An example of the calculation of the index is shown below in the Appendix. This is a very common approach to aggregating composite indices. It is also how the CDI is aggregated. Prior to aggregation a number of important steps are required.

Following the CDI, scores for each component are standardised so that they average to five in a base year.⁸ This dictates that there are no upper or lower bounds to the component scores. While this violates a desirable (but by no means necessary) property that standardised scores should fall within an intuitive scale, it easily enables a reader to identify whether a component score is above or below the base year average (see Roodman, 2013). It importantly satisfies the property that the components are scale neutral. Using this methodology, countries whose aid programs, for example, are deemed more than twice the average receive a score above ten.

Equal weights are applied to the seven components of the Pacific Index to provide the aggregate index score, so that the index is a simple arithmetic mean or equally weighted average of the seven components. Weighting is an extremely difficult issue as, in principal, weights should reflect the relative importance of each of the policy areas to growth and development in the Pacific. The largest weight would be assigned to the component representing the policy area that has the biggest impact on growth and development in the Pacific, the second largest weight to the policy area with the second largest impact on so on. This weighting scheme was ruled out on the grounds that the information required to implement it does not exist. The choice of equal weights is consistent with general practice in composite indices. The well-known Human Development Index uses such a scheme, as does the CDI. The rationale for such a scheme is that since the correct weights are not known, and that it is not possible to obtain agreement among relevant stakeholders as to

⁸ The base year is 2012 for this version of the Pacific Index 2014.

the weights to assign, the next best alternative is to invoke Occam's Razor and assign equal weights.⁹

These complexities notwithstanding, the Pacific Index has also been computed using different weighting schemes. The thinking behind this was to investigate whether different weighting schemes produce markedly different rich country rankings. The chosen schemes were weights obtained from the statistical procedure Principal Components Analysis, plausible weights that reflect crude intuition regarding the relative importance of the seven policy areas to growth and development in the Pacific, and weights that are purely randomly determined within the range of zero to unity.¹⁰ The second of these schemes was guided by findings from existing empirical studies concerned with development in the Pacific. While these studies cannot provide definitive weights for the seven components of the index, they can provide an indication of the relative importance that the different components in development in the Pacific region. In consideration of this empirical evidence, the following (plausible) weights were assigned to the seven components of the Pacific Index: aid (10 per cent); trade (20 per cent); finance (10 per cent); migration (20 per cent); the environment (20 per cent); security (10 per cent) and technology (10 per cent). Variants of this scheme were also assigned. In each case these variants were consistent with the ranking of importance of the policy areas reflected in the plausible weights.

The main conclusion of this analysis is that selecting different weighting schemes for the Pacific Index does not make a marked difference to the messages it provides.¹¹ The countries at the very top and bottom of the rich country league table, and their rankings with these ranges, are largely the same. This is not to say, however, that at all ranges the index rankings are not altered by selecting different weights. At the middle ranges rankings

⁹ An excellent discussion of the issues of scaling and weighting the various components of the CDI is provided by Roodman (2013). He notes that while the way in which some of the multiple indicators are combined in the index is grounded in clear conceptual and theoretical frameworks, this is not true for others. While the various weightings of indicators are arbitrary and open to challenge, the choice in the CDI is backed up by drawing on the experience of many experts in the relevant fields.

¹⁰ Principal Components Analysis (PCA) is used to extract a set of principal components from the Pacific Index data. Each principal component is a weighted linear combination of the seven variables included in the index. The first principal component explains the largest amount of variation in the data and is used as a set of weights for the CPDI.

¹¹ Pacific Index scores obtained from these weighting schemes are available on request from Pacific.Index@sustineo.com.au

do change with the selection of different weights, just that selecting different weights did not provide greater clarity. We return to this issue below.

4. The Pacific Index 2014

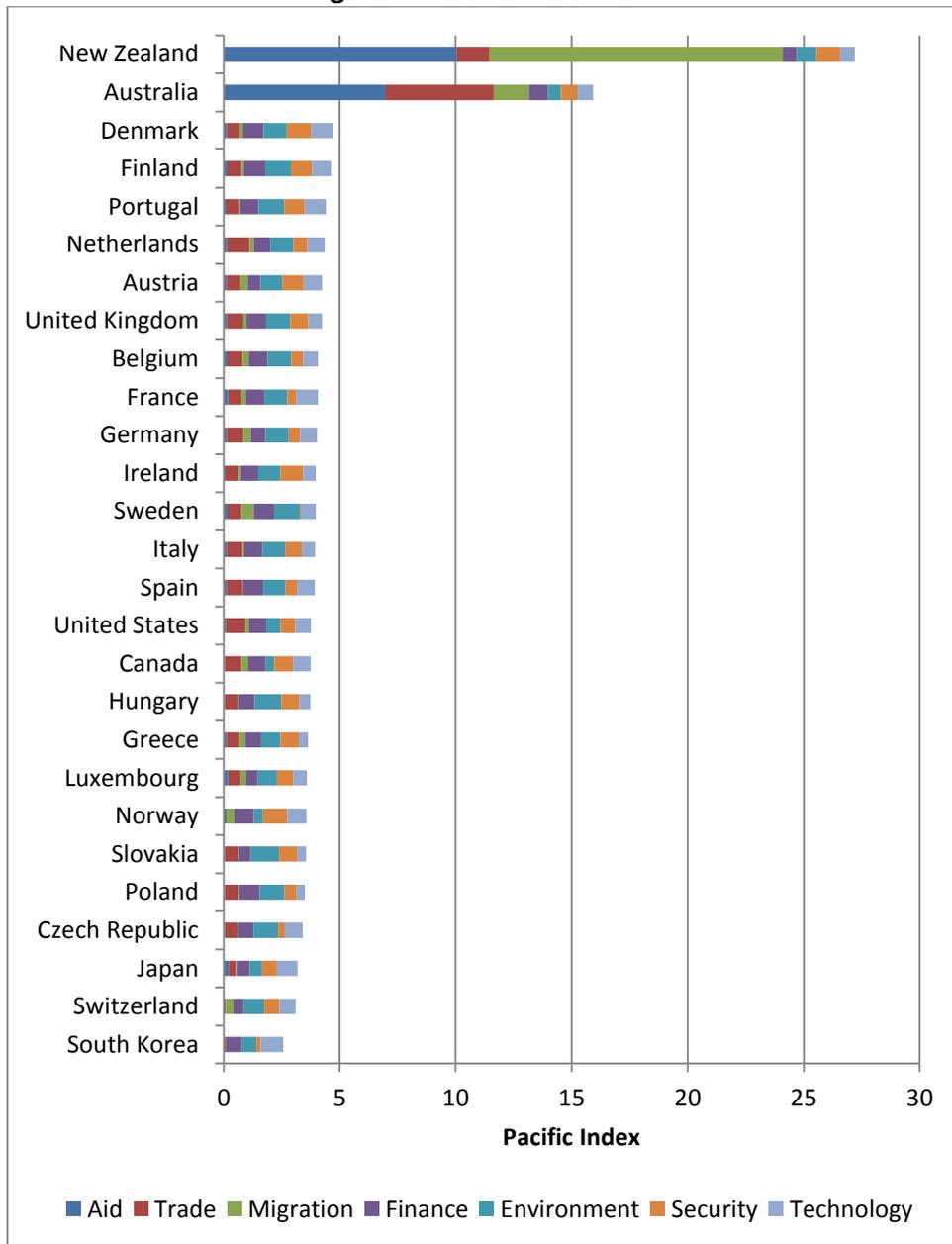
The aid, trade and migration components of the 2014 Pacific Index have been calculated using the most recent statistical information available up to December 2013. This is the year 2011 for most indicators. The remaining components are taken from the 2013 CDI.

Which countries are currently displaying the greatest commitment to development in the Pacific and which do the least? Figure 2 provides the answers to these questions.¹² New Zealand heads the Pacific Index 2014 league table, and by a large margin. New Zealand's index score is approaching twice that of the country displaying the second largest commitment, Australia. Proximity to the Pacific Island countries does not go hand in hand with relatively high commitment to their development as Japan and South Korea are at the opposite end of the league table, being ranked third last and last, respectively.

New Zealand's ranking at the head of the league table is primarily due to its performance in the aid, migration and to the lesser extent, security components. It tops the rankings in the aid and migration components of the index, and is ranked second in the security component. Recalling how the Pacific Index works, how its scores are to be interpreted, New Zealand's performance is not necessarily due to it providing the most aid to Pacific Island countries and taking the most migrants, students and refugees from these countries. In the case of aid, for example, Australia in recent years has provided approximately six times the level of ODA to the Pacific that New Zealand has provided. New Zealand has provided much more ODA relative to its GNI (25 percent more in recent years) and which has been of better quality. New Zealand well and truly thumps all other countries in migration – New Zealand's score for this component is 8.5 times that of Australia as the second ranked country. Australia tops the rankings in trade, and is ranked second to New Zealand in aid and migration.

¹² Index scores based on data available at the end of 2009 to 2012 are also shown in Table A2 of the Appendix. Scores for each component for the most recent data, that for 2013, which are used to calculate the Pacific Index 2014 are shown in Table A1.

Figure 1: Pacific Index 2014

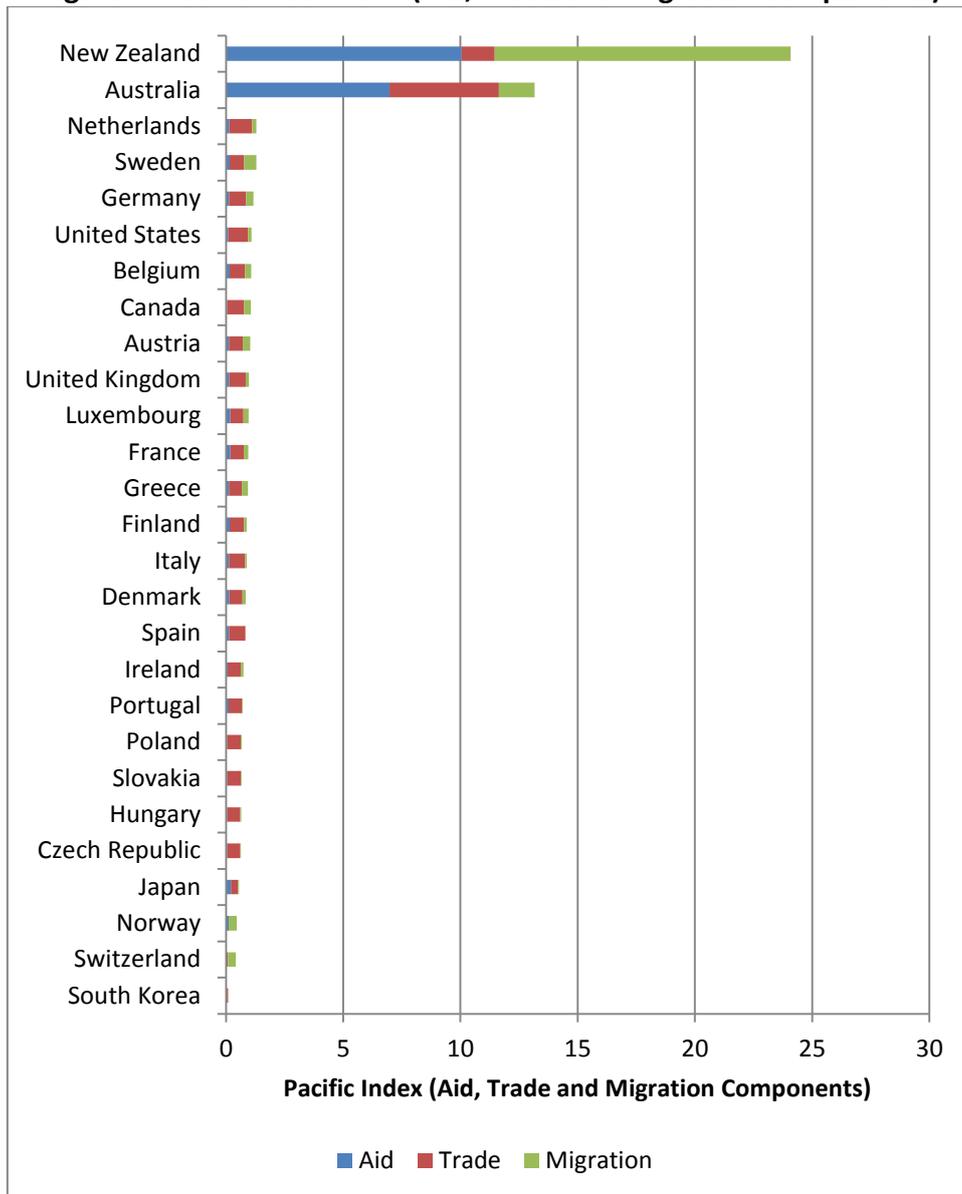


South Korea's ranking, at the bottom of the league table, is primarily due to its very low commitment to Pacific development in aid, trade, migration and security. It is ranked last in the migration component and second last in the aid, trade and security components. It is, however, ranked first in the technology component. Japan's very low ranking reflects its low commitment to the environment and in aid and finance. It is ranked third last in the first of these components, and fourth last in the aid and finance components. Japan ranks third in the aid component, although a long way behind Australia and New Zealand.

Recall that scores for the finance, security, environment and technology components of the index are not based on direct support for the Pacific, but instead reward rich countries for support for global public goods from which all developing countries benefit. A number of the rich countries find themselves toward the top of the Pacific Index league table based on their scores in these components. Take, for example, Denmark and Finland – the Pacific Index ranks them third and fourth, respectively. Denmark's ranking is largely due to its performance in technology and security, in which it is ranked second in both. Finland's is largely due to its performance in finance and the environment, in which it is ranked first and fourth, respectively. This is not to say that these countries do poorly in all other areas, just that they do best global public good components.

What would the rich country league table look like if the Pacific Index was based on direct commitment to development, being based only on the aid, trade and migration components? Figure 2 answers this question. New Zealand again dominates, with Australia ranked number two. Japan, Norway, Switzerland and South Korea are at the bottom of the league table. There are some changes between the very highest and lowest positions. For example, Denmark falls from third to sixteenth, and Sweden jumps from thirteenth to fourth.

Figure 2: Pacific Index 2014 (Aid, Trade and Migration Components)



The Pacific Index clearly differentiates between the countries making the greatest effort to promote development among the Pacific Island countries and those make the least effort. In other words, it is very good at separating the very best from the very worst. But it does not as clearly differentiate countries that are positioned between these two extremes. This invokes what is known in research circles as the issue of rank robustness.¹³ We have already touched on this issue, through the above discussion of different weighting schemes. But the issue goes well beyond weights. In any indicator like the Pacific Index, there are inevitably design uncertainty issues. As mentioned, different but still broadly plausible component weights can be chosen, variables can be measured in different ways, the components can be aggregated according to alternative approaches and alternative within component weights can be chosen. There also are concerns about measurement error and so on. In short, the science of measures like the Pacific Index is imprecise and one needs to exercise caution over rankings, especially when small differences in index values differentiate countries.

Table 1 addresses the issue of imprecision or, put differently, design uncertainty. The table does not assign a unique ranking to each of the 27 rich countries in question, but groups countries over which there is uncertainty over their precise rankings. New Zealand still ranks above Australia based on the quite large difference in their Pacific Index values. Selecting a different set of plausible weights, for instance, would not alter this pair wise ranking. But the same cannot be said for Denmark and Finland, hence they are given a shared ranking of four. The same applies to Portugal, the Netherlands, Austria and the United Kingdom, which are assigned a shared ranking of eight. This applies to the Pacific Index with all components. The same exercise is undertaken for the restricted index, as is shown in the last column of Table 2. Even allowing for design uncertainty, the Pacific Index clearly indicates which countries display the greatest commitment, and are putting in the greatest effort in helping the Pacific Island countries achieve higher growth and development than would otherwise be the case.

¹³ See, for example, Foster et al. (2012).

Table 1: Rich Country Rankings Allowing for Design Uncertainty

Country	Pacific Index	Country	Pacific Index (Aid, Trade and Migration Components)
New Zealand	1	New Zealand	1
Australia	2	Australia	2
Denmark	4	Netherlands	4
Finland	4	Sweden	4
Portugal	8	Germany	5
Netherlands	8	United States	9
Austria	8	Belgium	9
United Kingdom	8	Canada	9
Belgium	16	Austria	9
France	16	United Kingdom	10
Germany	16	Luxembourg	13
Ireland	16	France	13
Sweden	16	Greece	13
Italy	16	Finland	15
Spain	16	Italy	15
Canada	16	Denmark	17
Hungary	24	Spain	17
United States	24	Ireland	18
Greece	24	Portugal	19
Slovakia	24	Poland	23
Luxembourg	24	Slovakia	23
Norway	24	Hungary	23
Poland	24	Czech Republic	23
Czech Republic	24	Japan	24
Japan	26	Norway	25
Switzerland	26	Switzerland	26
South Korea	27	South Korea	27

4. Conclusion

The Pacific Island nations, like all developing countries, face many challenges to improve the living standards of their citizens, to pull people out of income poverty, to reduce infant and child deaths, to ensure that all children complete primary school and, more generally, enable people to exercise their reasoned agency. Yet based on the experience of recent decades, they face even greater challenges in doing this than most other developing countries. This is in spite of the fact that as a regional grouping they receive tremendously high levels of aid per capita, four times higher in these terms than sub-Saharan Africa.

Rich countries have a responsibility to assist Pacific Island countries to achieve higher growth and development. Good international citizenship demands this response. This

response involves far more than providing aid as aid alone clearly has not been sufficient to satisfactorily address the development challenges faced by the Pacific.

The Pacific Index has been devised to show which rich countries are making the greatest effort to assist Pacific Island countries achieve higher levels of development, and which are making the least effort, not only in aid but also trade, finance, migration, the environment, security and technology.

The Pacific Index shows that of the 27 rich countries in question, New Zealand is making the greatest effort, and by a long margin. The 26 other countries need to look at New Zealand's performance, in particular the areas of policy that have put New Zealand in this position. In essence, New Zealand and to a lesser extent Australia, provide benchmarks for other rich countries to aspire towards. And New Zealand can of course do better. Japan and South Korea, of all rich countries under consideration, need to do far better.

Where to from here for the Pacific Index? It will be used for advocacy in an attempt to get all rich countries to do more for the Pacific Island Countries. This should not be interpreted by rich countries as just providing more aid to the Pacific Island countries. This response has been too heavily relied on in the past, and as noted at the outset of this paper more aid alone clearly is not enough effectively tackle the development challenges faced in the Pacific. It is also about better aid, about providing greater market access for Pacific Island exports, about providing greater access to labour markets for migrants from the Pacific, about more and better finance, about greater security, about better efforts to promote environmental standards and about better efforts to transfer effective technology.

On the Pacific Index itself, it will be further refined, but will still be based on the same policy areas. And it will be released periodically, subject to necessary resources being available. So please stay tuned on this front. With regard to the technical refinements, among the issues considered will be further work on the security component to take explicit account of RAMSI. The civilian elements of RAMSI that qualify as ODA are already included in the aid component of the index, but it would be desirable to include other elements in the index's security component. This would mean that the security component will reflect both global efforts to promote security from which Pacific Islands benefit, but specific regional efforts that provide added benefit. Similar work could be undertaken on the

environment component of the index. Another refinement that could be considered concerns the aggregation of the components to form the index. Taking the arithmetic mean implicitly assumes that seven policy areas are perfectly substitutable, so that a rich country could maintain its index score by, say, providing more aid and less trade. This in turn assumes that the impacts of aid and trade on growth and development in the Pacific are unrelated, with either impact not depending in anyway on the other. Aggregating the index components by adding them together, taking their sum, is invalid if this assumption is incorrect. Aggregation through multiplying the components, taking their product, is the correct approach in this situation. Whether this makes any practical difference to the Pacific Island league table remains to be seen, of course.

Appendix: Pacific Index Data and Calculations

Table A1: Pacific Index 2014: Component Scores and Calculations

Country	Index Components							Pacific Index		Pacific Index (Aid, Trade and Migration Components only)	
	Aid	Trade	Migration	Finance	Environment	Security	Technology	Index Score	Index Rank	Index Score	Index Rank
New Zealand	70.38	9.84	88.40	4.20	6.02	7.13	4.43	27.20	1	24.09	1
Australia	48.79	32.67	10.71	5.75	3.82	5.05	4.66	15.92	2	13.17	2
Denmark	1.00	3.97	0.92	6.17	7.03	7.22	6.60	4.70	3	0.84	16
Finland	1.12	4.29	0.80	6.33	7.77	6.44	5.65	4.63	4	0.89	14
Portugal	0.81	4.07	0.13	5.54	7.70	6.20	6.39	4.40	5	0.71	19
Netherlands	0.98	6.83	1.28	5.00	6.94	4.22	5.20	4.35	6	1.30	3
Austria	0.89	4.13	2.18	4.02	6.59	6.31	5.64	4.25	7	1.03	9
United Kingdom	1.00	4.92	0.99	5.91	7.34	5.40	4.19	4.25	8	0.99	10
Belgium	1.10	4.65	1.74	5.67	7.21	3.68	4.44	4.07	9	1.07	7
France	1.26	4.03	1.40	5.54	7.06	2.60	6.56	4.06	10	0.95	12
Germany	0.92	5.03	2.22	4.42	7.07	3.48	5.07	4.03	11	1.17	5
Ireland	0.56	3.86	0.82	5.16	6.74	6.94	3.75	3.98	12	0.75	18
Sweden	1.06	4.34	3.65	6.17	7.80	0.28	4.51	3.97	13	1.29	4
Italy	0.89	4.83	0.49	5.50	6.90	5.08	3.93	3.95	14	0.89	15
Spain	0.91	4.87	0.09	6.09	6.70	3.43	5.43	3.93	15	0.84	17
United States	0.67	5.89	1.08	5.14	4.31	4.58	4.68	3.77	16	1.09	6
Canada	0.34	5.04	2.00	5.32	2.63	5.61	5.33	3.76	17	1.06	8
Hungary	0.34	3.92	0.32	4.82	8.04	5.51	3.21	3.74	18	0.65	22
Greece	0.88	3.85	1.83	4.70	5.86	5.63	2.74	3.64	19	0.94	13
Luxembourg	1.31	3.89	1.52	3.58	5.76	4.90	4.14	3.58	20	0.96	11
Norway	0.79	0.02	2.38	5.87	2.83	7.39	5.71	3.57	21	0.46	25
Slovakia	0.32	4.15	0.18	3.58	8.56	5.55	2.63	3.57	22	0.66	21
Poland	0.31	4.10	0.33	6.05	7.57	3.67	2.53	3.51	23	0.68	20
Czech Republic	0.35	3.95	0.12	4.52	7.50	2.01	5.42	3.41	24	0.63	23
Japan	1.52	2.04	0.32	3.90	3.81	4.47	6.25	3.19	25	0.55	24
Switzerland	0.17	0.43	2.36	3.15	6.13	4.58	4.88	3.10	26	0.42	26
South Korea	0.23	0.35	0.06	4.88	4.33	1.30	6.82	2.57	27	0.09	27

Calculations

The Pacific Index is calculated by taking the simple average of the seven components. In New Zealand's case, for example, the index is calculated as follows.

$$\frac{70.38 + 9.84 + 88.40 + 4.20 + 6.02 + 7.13 + 4.43}{7} = 27.20$$

The Pacific Index based only on the Aid, Trade and Migration is calculated by taking the simple average of these three components only. Note that Figures 2 and 3 above, and in the Policy Brief *Supporting Development in the Pacific: The ADRI-Sustineo Pacific Index* and the Pacific Index *Briefing Note 1*, all the components are as they mathematically appear in the index: each is divided by seven. So, for example, New Zealand's aid component is 10.05 (=70.38/7) and migration 12.63 (=88.40/7). This is the case for all components for all countries in these charts.

The formulae for calculating each individual component of the index can be found in Roodman (2013), although it should be kept in mind that the Pacific Index treats proliferation differently, as noted above.

Table A2: Pacific Index Scores, 2009 to 2013

Country	2009	2010	2011	2012	2013
Australia	14.84	14.30	14.83	15.23	15.92
Austria	3.75	3.83	4.04	4.20	4.25
Belgium	4.03	4.03	4.03	4.05	4.07
Canada	4.23	4.11	4.05	3.76	3.76
Czech Republic				3.31	3.41
Denmark	4.28	4.16	4.56	4.71	4.70
Finland	4.36	4.44	4.74	4.69	4.63
France	3.71	3.75	4.04	4.27	4.06
Germany	3.64	3.73	3.90	4.03	4.03
Greece	3.93	3.97	3.77	3.69	3.64
Hungary				3.71	3.74
Ireland	3.97	3.88	4.00	3.96	3.98
Italy	3.87	3.87	3.90	3.92	3.95
Japan	2.86	2.93	3.22	3.35	3.19
Luxembourg				3.64	3.58
Netherlands	4.03	4.05	3.98	4.16	4.35
New Zealand	26.81	29.27	28.26	27.19	27.20
Norway	3.61	3.65	3.69	3.58	3.57
Poland				3.49	3.51
Portugal	3.99	4.18	4.34	4.48	4.40
Slovakia				3.54	3.57
South Korea	2.10	2.11	2.29	2.42	2.57
Spain	3.73	3.86	3.94	4.03	3.93
Sweden	4.18	4.11	4.20	4.11	3.97
Switzerland	3.05	2.95	3.04	3.02	3.10
United Kingdom	4.16	4.18	4.40	4.25	4.25
United States	3.52	3.66	4.05	3.88	3.77

Note: the Pacific Index for 2013 is the Pacific Index 2014. That is, as explained above, the latter is based on data available up to December 2013 but released in 2014. In this table, the index scores for 2012 are those based on data available up to December 2012, those for 2011 are based on data available up to December 2011 and so on.

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