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Value Chains and Connectivity in the Pacific

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Abstract

This paper examines global value chain (GVC) activity in the Pacific, through the lens of newly assembled data on value added trade. It finds that GVC participation is very weak by world standards. Connections with relatively large markets like Australia and New Zealand are frequently stronger than connections with Pacific neighbours. The paper then examines data that could help explain these findings, focusing on bilateral trade costs and transport connectivity, as influenced by non-traditional trade policies like regulatory barriers. It concludes that there is considerable scope for the Pacific to promote value chain integration by improving connectivity in all its dimensions, particularly air.

JEL Codes: F13, F14

Keywords: Global Value Chains, Pacific, connectivity

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Abbreviations and acronyms

ACI	Air Connectivity Index
GVC	global value chain
LPI	Logistics Performance Index
LSCI	Liner Shipping Connectivity Index
RVC	regional value chain

1. Introduction: Trade and Trade Costs in the Pacific

The Pacific Islands¹ are characterised by small populations, archipelagic dispersion and geographical isolation from major markets. All of these characteristics hamper their integration into regional and global trading systems. Relative prices remain insulated from the changes that integration with world markets can bring, and consumers and firms that use imported intermediate inputs are limited in the range of goods to which they have access at competitive prices. In addition, local exporters are held back, which in turn limits dynamism in the labour market that can create good jobs, and contribute to value added in these small economies.

One metric that provides an overall indication of a country's degree of integration with world markets comes from the ESCAP-World Bank Trade Costs Database (Arvis et al., Forthcoming). The database provides a comprehensive measure of bilateral trade costs. It incorporates all factors that drive a wedge between factory gate prices in the exporting country and consumer prices in the importing country. It therefore covers the full range of trade frictions, including tariff and non-tariff barriers, regulatory measures, standards, differences in cultural and legal institutions, and geographical and historical factors. Bilateral data can be aggregated into a single number per country by calculating 'average' trade costs, in the sense of a constant value for trade costs that, if applied to all bilateral partners, would result in the same level of total trade as is actually observed in the data.

Results for the Pacific Islands, along with the two major regional markets of Australia and New Zealand, are shown in Figure 1. The first point to note is that despite being similarly geographically isolated from major world markets like the USA, Europe, and Japan, Australia and New Zealand have much lower levels of trade

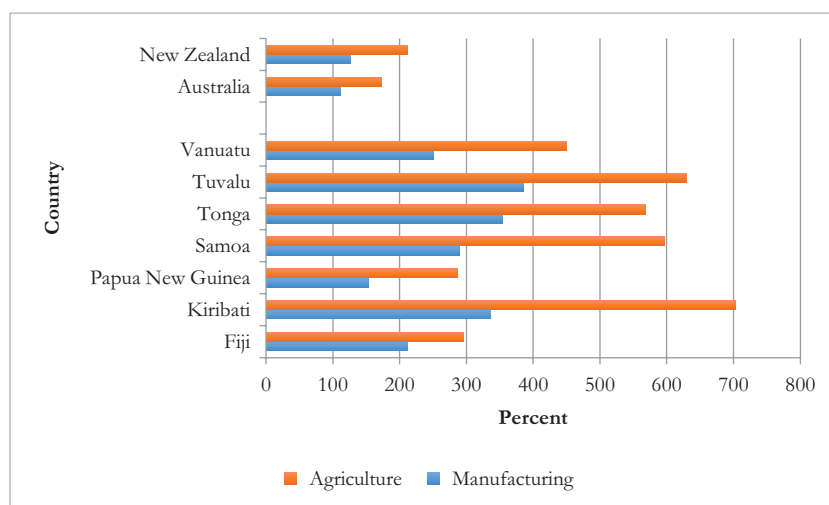
costs than those typically observed in the Pacific countries for which data are available. Indeed, trade costs in the Pacific are often on the order of twice or three times as high as those observed in Australia and New Zealand. Many factors contribute to this result, and some possible policies that might be at play are addressed later in this Policy Brief. For the moment, it is enough to note that the data confirm that the Pacific Island countries are relatively isolated from world markets in both agriculture and manufacturing.

A second important point that emerges from Figure 1 is that trade costs in agriculture are higher than in manufacturing for all countries. This facet of the data is something that the Pacific Islands have in common with the rest of the world (Arvis et al., Forthcoming). Policy is an important part of the reason why trade costs in agriculture are elevated compared with manufacturing: world markets for primary products, as well as processed goods, are subject to a range of tariff and non-tariff barriers, as well as domestic regulatory measures such as product standards and health requirements. Not all of these measures holding back agricultural trade are protectionist in intent, but the point remains that their effects can be serious, in particular for small developing economies like the Pacific Islands. Indeed, trade costs for agriculture in a number of the Pacific Island countries are above 500 percent ad valorem, which is essentially a prohibitive level: these countries are largely locked out of international markets.

Aggregate numbers such as the ones shown in Figure 1 are important for giving general context to the observed pattern of trade in the Pacific Islands. But there is also insight to be gained from looking at the underlying bilateral data. It is difficult to produce intra- and extra-regional trade costs matrices as in Arvis

¹ This Policy Brief, prepared for the Commonwealth Secretariat, limits consideration to the following countries that are also Commonwealth member countries: Fiji, Kiribati, Nauru, Papua New Guinea, Samoa, the Solomon Islands, Tonga, Tuvalu, and Vanuatu.

Figure 1. Trade costs in agriculture and manufacturing, percent ad valorem equivalent, selected countries, latest available year.



Note: Data are not available for the remaining Pacific Islands.

et al. (Forthcoming) because there are many missing values for the countries of interest. Indeed, data availability is a serious constraint for analysing trade relations in the Pacific: missing data, as well as data quality issues, mean that results need to be taken as indicative only.

A point of general application arises from taking Fiji as a case study (Table 1): trade costs with neighbouring countries tend to be higher than those with but larger regional markets like Australia and New Zealand. This point holds true for agriculture as well as manufacturing. Although the distances involved are significant in all cases, the evidence suggests that it may in some cases be easier to trade with more developed but more distant markets, than with neighbouring countries. The point is important because it emphasises the relative lack of development of intra-regional trade links in the Pacific, as well as the fact that connecting with countries like Australia and New Zealand, which are much better placed in international transport networks than the Pacific countries, is easier and less costly than connecting with neighbouring countries, at least on a scale relevant for international trade. Arvis et al. (Forthcoming) make a similar observation for intra-regional trade in South Asia, where anecdotal evidence supports the data: it is frequently more cost effective to transship via Singapore than to

Table 1. Bilateral trade costs for Fiji in manufacturing and agriculture, percent ad valorem equivalent, selected countries, 2010.

	Manufacturing	Agriculture
Kiribati	112%	NA
Papua New Guinea	NA	310%
Samoa	128%	NA
Tonga	139%	278%
Vanuatu	91%	174%
Australia	86%	124%
New Zealand	87%	113%

Note: Data are not available for the remaining Pacific Islands. New Zealand data are for 2009.

ship directly from one port to another within South Asia.

The sources of trade costs among the Pacific Islands – looking beyond geography to consider policy and institutions – need to be understood so that appropriate actions can be taken to better integrate the regional economy, and develop a solid basis of intra-regional, as well as extra-regional, exchange. The remainder of this Policy Brief addresses the issues that arise in this context from the perspective of value chains, a business model that is well established in some parts of the world, but only now starting to develop in many smaller economies.

2. Value Chains as Networks of Trade in Value Added

A value chain is a set of economic activities needed to bring a product to market, from conceptualisation and research and development, to manufacturing, to marketing and sales, to post-consumer recycling. Over the last two decades, some lead firms have internationalised to the point where global and regional value chains (GVCs), in which activities are split across multiple national territories, are now common in many parts of the world, at least in some sectors. Most concentrated in ‘factory Asia’ as well as in developed Europe and the United States, GVCs are an important reality for developing countries. Analytical and policy work is still catching up with this new reality, as it offers a number of challenges. On the one hand, it is important to develop measures of trade in value added, as opposed to measuring trade on a gross shipments basis, so as to emphasise the activity of value addition that is core to the relationships among actors in value chains. Secondly, trade in tasks rather than final goods is becoming more pronounced in many parts of the world, but realities differ from region to region and from sector to sector, so it is important to reach a nuanced understanding of the way in which value chains operate internationally.

Value chain development is at a relatively early stage in the Pacific compared with East and Southeast Asia in terms of developing the firm-level linkages and relationships that characterise GVCs, in particular the forging of connections between large lead firms active in international markets and local suppliers of goods and services (tasks). However, there are initiatives afoot to develop regional value chains in sectors like agriculture. For example, one project aims at developing breadfruit exports from the Pacific Islands to New Zealand by addressing weaknesses in the value chain, such as maintaining quality and controlling costs (McGregor and Stice, 2014).² The Food

and Agriculture Organization also has a regional project to develop local value chains for food and nutrition security, including through increased participation of the Pacific Islands in the setting of international standards in the sector – a crucial issue for internationalising production.³

Although value chains are better known in manufacturing sectors, there are many similarities with the organisation of the modern high-value agricultural export sector. The more recent GVC literature itself has evolved from world systems theory, with its historical antecedents including the Global Commodity Chain literature (Keane, 2014). Value chain analysis for an agricultural commodity would emphasise all of the steps required to get the product to market, from obtaining seeds and other inputs, through harvesting methods, post-harvest treatment and storage, processing at various stages into transformed agricultural goods, logistics and handling, transport, and distribution to the final consumer including via intermediaries or direct through retailers. In this context, intermediate inputs include services, such as transport, logistics, and distribution, as well as goods such as seeds, fertilisers and packaging products used for food processing.

Traditional trade statistics reported on a gross shipments basis do not net out intermediate input use. This situation is in contrast to the national accounts, where inputs are subtracted before calculating GDP and other aggregates. Recent developments in empirical international trade analysis have enabled researchers and international agencies to develop measures of the value added embodied in a country’s exports, accounting for the fact that part of the gross shipments value comprises intermediate goods, some of which are imported. Accounting for these kinds of transactions is crucial in the GVC context: modern business models can be

2 For other examples of agricultural value chains in the Pacific, see <http://www.aglinks.net/content/pacific-value-chain-analysis>.

3 <http://www.fao.org/asiapacific/perspectives/local-value-chains/en/>.

viewed as the co-ordination of value addition and the movement of intermediate inputs across national boundaries in the context of production of final goods and services.

This Policy Brief uses the Eora input-output matrices to calculate measures of value added in exports for the Pacific Islands and their main trading partners, Australia and New Zealand. Consideration is given to two sectors in particular: (raw) agriculture, and (processed) food and beverages. These sectors are important in the value added exports of a number of Pacific Island economies, and represent the basis for possible value chain development. Agriculture is a major source of employment in the Pacific Islands, and a number of commodities, such as tropical products, sugar, fish, and specialty goods like vanilla are important export earners for these economies (Malua, Undated). Tonga, for example, exports in particular fish, vegetables and fruits to Australia, New Zealand and regional partners Fiji and Samoa.

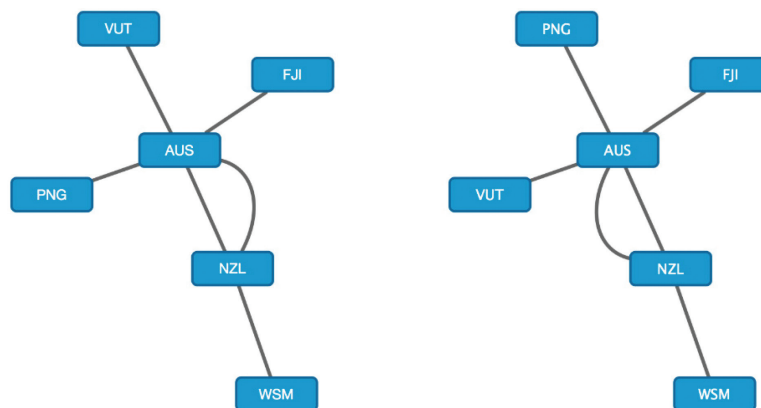
Although the trade in value added statistics used here can be informative, they come with major caveats regarding data quality for the Pacific Islands. Input-output tables are estimates based on national sources, along with assumptions made as to the use of imported intermediates. Often, it is necessary to convert national sources to a standardised classification using a concordance, but doing so can introduce statistical noise. Finally, it is generally recognised that trade in value added statistics are most accurate at the aggregate level, and for large economies. Accuracy is more of an issue

for small economies, which is the case here, and when the analysis is undertaken at the sectoral level. Nonetheless, the approach is potentially fruitful in terms of highlighting general tendencies in Pacific Island value chains, and is useful to policy-makers because of the novelty of the entire analysis.

To emphasise that value chains are networks of co-ordinated transactions rather than a linear series of point-to-point movements, Figures 2 and 3 represent the value added in exports data in network form for agriculture and food and beverages respectively, taking 2000 and 2012 as the base years. For each country, only its largest export flow is considered, in order to lay bare the most basic structure of the Pacific value added trade network. Each country is represented as a box, and its largest trade flow is a line connecting it with the destination market. There is no unique graphical representation of data such as these, but the interpretation of the diagrams is that more central countries in the trading network tend to appear as central hubs in the diagram, while more peripheral countries appear as less well-connected spokes. The reason for only considering the largest export flow of each country is that from a graphical point of view, the diagrams become overly complex and difficult to interpret when trade flows with all partners are considered.

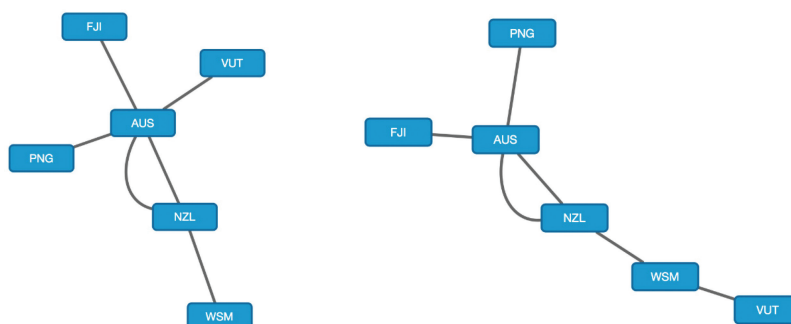
Together, the two figures highlight the key role played by Australia and New Zealand as sources of demand for Pacific Islands' value added in both sectors. For agriculture, no Pacific Island has its largest trade flow with

Figure 2. Network representation of value added trade in agriculture in the Pacific region, largest export flow only, 2000 (left) and 2012 (right).



Note: Country codes are Australia (AUS), Fiji (FJI), New Zealand (NZL), Papua New Guinea (PNG), Samoa (WSM) and Vanuatu (VUT).

Figure 3. Network representation of value added trade in food and beverages in the Pacific region, largest export flow only, 2012.



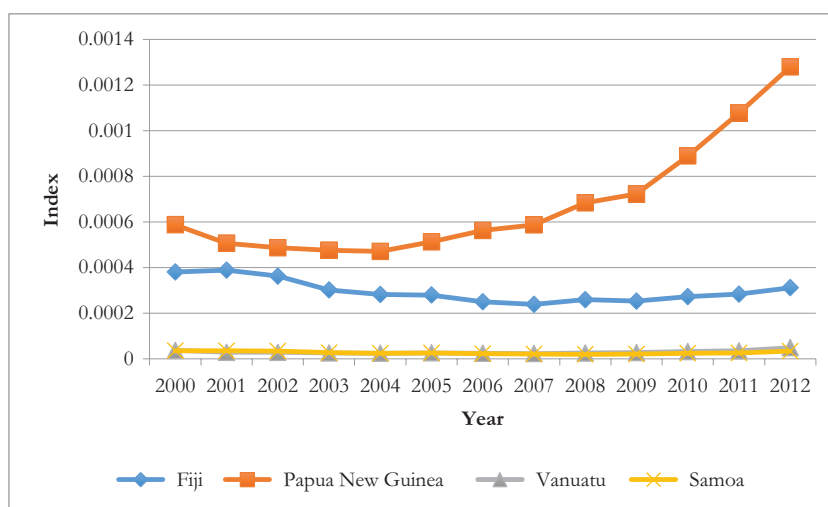
Note: Country codes are Australia (AUS), Fiji (FJI), New Zealand (NZL), Papua New Guinea (PNG), Samoa (WSM) and Vanuatu (VUT).

another Pacific Island: all have it with either Australia or New Zealand. The situation is only slightly different for food and beverages, where Vanuatu has its largest export flow with Samoa (a point that should be taken with major caveats, as the data for 2012 for Vanuatu appear to be anomalous). In any case, the network diagrams reinforce the trade costs analysis presented above: given market size and connectivity considerations, it makes most economic sense for exporters in the Pacific Islands to deal with Australian and New Zealand customers rather than customers in neighbouring countries, at least at the scale relevant for tracking international trade transactions. Of course, the relative size of those two markets is an important factor in that outcome, as it is well established that trade flows increase with destination market

size. Nonetheless, it is likely that trade costs – including some that are amenable to policy action – also play a role. A final feature of the network diagrams that is worthy of note is their stability: the underlying structure is basically the same in the two base years, despite their being more than a decade apart. The overall structure of trade in these two sectors in the region is therefore quite persistent through time.

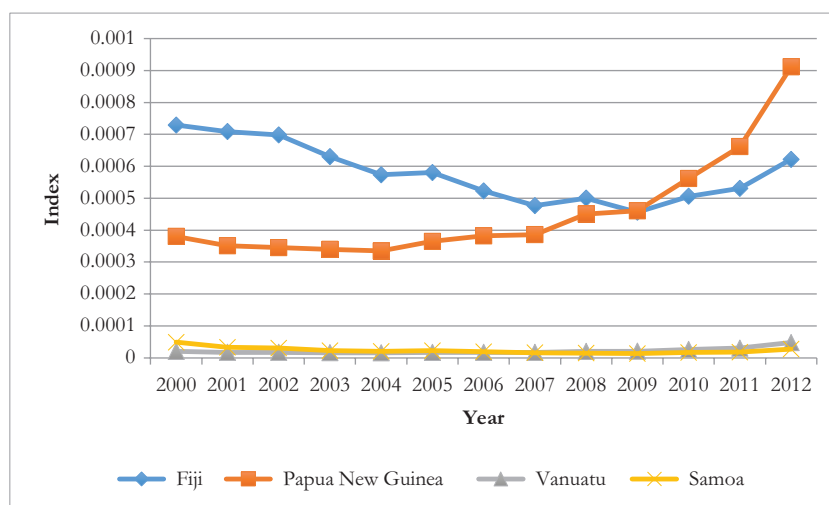
One way of measuring a country’s ability to connect to value chains is to use the lens of centrality, a concept that is well defined in the network science literature (Shepherd and Archanskaia, 2014; Shepherd, Forthcoming). A country is more central to a network if it is strongly connected to other countries that are themselves relatively central. It is less central

Figure 4. Connectivity (centrality) in agriculture, selected countries, 2000–2012, index between zero and one.



Note: Australia and New Zealand are omitted from the figure because their scores are so much larger than those of the Pacific Islands that the latter become unreadable.

Figure 5. Connectivity (centrality) in food and beverages, selected countries, 2000-2012, index between zero and one.



Note: Australia and New Zealand are omitted from the figure because their scores are so much larger than those of the Pacific Islands that the latter become unreadable.

if it is weakly connected to countries that are themselves relatively peripheral. Centrality is closely related to the concept of connectivity as it is operationalised within the networks of value added trade that are referred to as GVCs.

Figures 4 and 5 present value chain connectivity (centrality) scores for the Pacific Islands over the 2000–2012 period for agriculture and food and beverages respectively. In global context, the Pacific Islands have very low scores in both cases. New Zealand’s connectivity score in 2012 was over 2000 percent higher than that of the highest-placed Pacific Island in agriculture, and over 1000 percent higher for food and beverages. Clearly, the Pacific Islands are extremely isolated from value chain activity. The point is particularly true for Vanuatu and Samoa, which have scores very close to zero, which indicates a

large-scale isolation from international markets in these areas. Indeed, on a global level, the Pacific Islands are some of the most isolated economies when it comes to value chain activity: in agriculture, regionally top-ranked Papua New Guinea is 87th out of 158 countries for which data are available, compared with ranks 120, 152, and 155 for Fiji, Vanuatu, and Samoa respectively. Papua New Guinea is the only Pacific country for which data are available that consistently improves its connectivity scores in both sectors over the 2000–2012 period. Fiji, by contrast, has scores that are approximately the same at the beginning and the end of the sample period for both sectors. The general picture that emerges is thus one of ongoing isolation from GVCs in the global and regional context, at least in terms of the limited amount of data for two sectors examined here.

3. Connectivity and Value Chains: The Case of the Pacific

What are the drivers of the relative isolation of the Pacific Islands from GVCs in key sectors like agriculture and food and beverages? Geography is one factor. Its influence can, however, be mediated through the ability of

countries to connect to global transport networks in the maritime shipping and airline sectors, which in turn is affected by market institutions and regulations. It is important to see what the connections are between these two

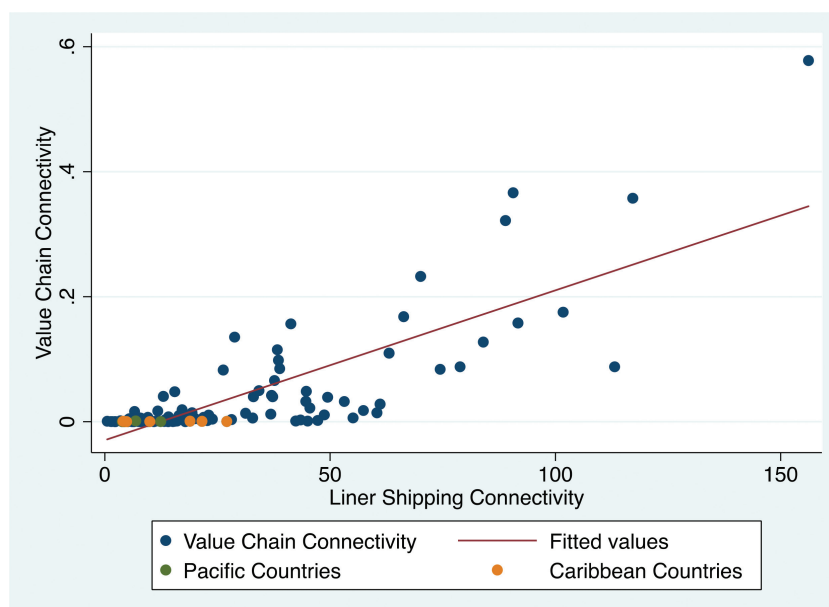
areas, so that appropriate transport sector policies can be designed to promote GVC integration.

Figure 6 takes the case of maritime connectivity, using UNCTAD’s Liner Shipping Connectivity Index (LSCI), and highlighting Caribbean countries⁴ in addition to the Pacific Island countries, to provide a small-country point of comparison. For reasons of space, only the case of agriculture is considered, but little turns on this choice as the underlying dynamic is the same for food and beverages. The upward sloping line of best fits shows that countries that are better connected to sea lanes are also better able to connect to GVCs in agriculture. The Pacific Island countries are in green, and the Caribbean countries are in orange. The Pacific countries are more or less clustered around the regression line, which suggests that their performance in GVC connectivity is approximately in line with what would be expected given their ability to connect to global shipping markets. Some Caribbean countries have stronger maritime connections than the Pacific countries, due to their geographical closeness to the USA, but they are still relatively

isolated from value chains. Clearly, work is needed to mobilise policy responses and private sector resources, covering transport but also going beyond, to help the Pacific Islands better connect to international markets, although geography is obviously a key constraint. Nonetheless, incremental improvements, in collaboration with development partners, may be possible.

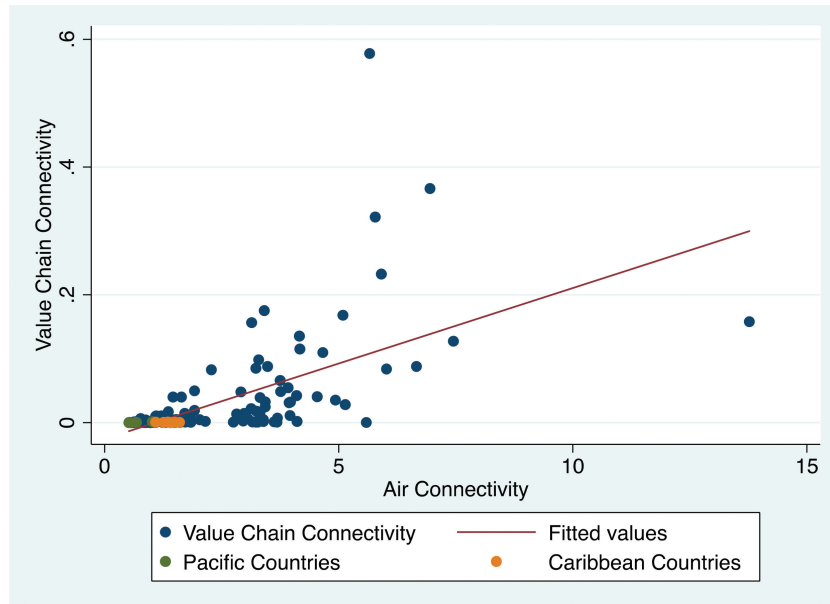
Figure 7 presents a similar analysis for air transport connectivity, using the World Bank’s Air Connectivity Index (ACI). Again, the upward sloping line of best fit shows that countries that are better connected to global air transport markets are also better connected to GVCs in agriculture. Indeed, air transport is particularly important for some new agricultural sectors, such as horticulture products and fresh fruits and vegetables, because they are perishable and therefore need to be transported quickly to destination markets. Again, the GVC connectivity performance of the Pacific Islands is essentially in line with what would be expected given their ability to connect to global air transport corridors. The Caribbean countries perform noticeably better in terms of air

Figure 6. Liner shipping connectivity vs. value chain connectivity in agriculture, 2012, index numbers.



4 Consideration is limited to Caribbean countries that are members of the Commonwealth and for which data are available, namely the Bahamas, Barbados, Belize, Guyana, Jamaica, and Trinidad and Tobago.

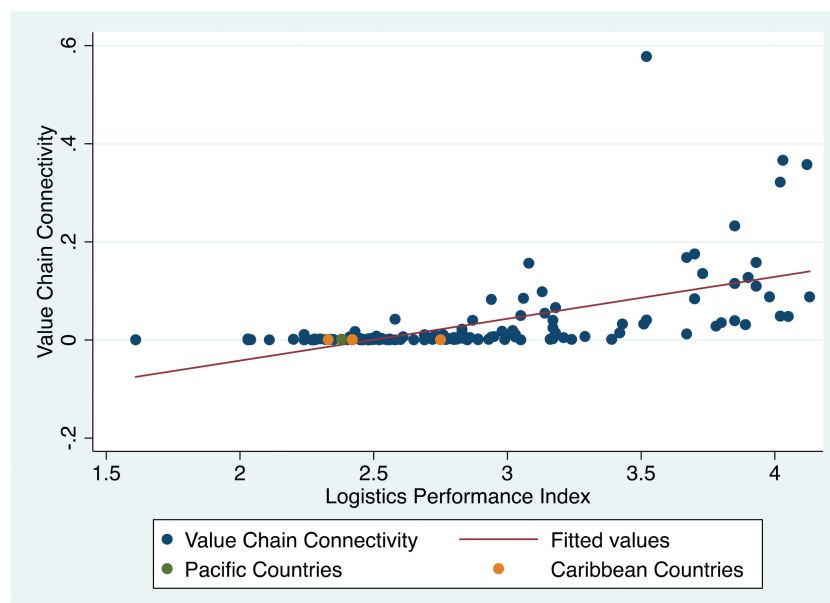
Figure 7. Air transport connectivity vs. value chain connectivity in agriculture, 2012, index numbers.



transport connectivity, due to their links with the USA. However, they too are quite isolated from international trade in value added in the agricultural sector. Policy is a key determinant of air transport connectivity, in particular the number and quality of Bilateral Air Services Agreements. Although geography is once again a real obstacle, there may be scope to mitigate its negative impacts by developing appropriate policy and private sector responses in the air transport sector.

Finally, Figure 8 consolidates the available information on connectivity performance by examining the association between value chain connectivity and the World Bank’s Logistics Performance Index (LPI). The LPI is a weighted average of six indicators, and is based on a survey of around 1,000 logistics professionals. It takes into account performance on trade and transport-related infrastructure, customs clearance, the ease of arranging competitively priced shipments, the ability to track and trace

Figure 8. Logistics performance vs. value chain connectivity in agriculture, 2012, index numbers.



consignments, timeliness of delivery, and the competence and quality of logistics services. As for the LSCI and the ACI, the Pacific countries have low scores relative to international benchmarks, but perform approximately in line with what would be expected given their trade facilitation environments. Logistics performance in the Pacific is reasonably similar to what is observed in the Caribbean, with the exception

of the Bahamas, which has a noticeably higher score. The positive association between the LPI and value chain connectivity suggests that regional value chains could be strengthened, and the Pacific countries' competitive position improved, by upgrading overall trade facilitation performance through measures such as regulatory reform and private sector development.

4. Policy Implications

This Policy Brief has analysed the trading position of the Pacific Islands through the lens of value chain analysis, based on an understanding of GVCs as network businesses. It has mobilised new data on trade costs and trade in value added to better understand the relative position of the Pacific Islands, focusing on two key sectors: (raw) agriculture, and (processed) food and beverages. Key findings include the fact that the Pacific remains isolated from world markets, including trade in value added, which means that regional partners like Australia and New Zealand are particularly important as sources of demand. The Pacific Islands are only very weakly connected to networks of value added trade, a finding that is driven in part by their corresponding isolation from global air and maritime shipping networks. On the positive side, there is evidence that Fiji has been improving its value chain connectivity consistently over the last decade – so there is a stock of practice in the region that can potentially inform policy action elsewhere, as countries try to boost competitiveness and integration into the regional and world economies.

Looking forward, what can policy-makers do to try and improve the situation? The first priority should be transport, and the development of stronger linkages with key nodes in global transport networks. These networks are the lifeblood of GVCs, and there is scope for the Pacific countries to reduce their very high trade costs by at least a certain amount by examining policies – including liberalisation – that could help boost connectivity, and help develop the private sector in these areas. Air transport is a particular priority, for two reasons. First, experience in other parts of the world, like Kenya

and more recently Ethiopia, shows that agricultural value chains that link with developed country markets often involve perishable products, so moving them quickly to their final destination is important. Second, maritime shipping linkages depend more on having high volumes for the development of links between countries. A substantial amount of air cargo in fact travels on passenger flights, so there is scope to leverage development of the tourism sector – which depends on air transport connections – to also develop cargo transport capacity that could be used to develop agricultural value chains.

Closely linked to transport is the logistics sector, and there is much work suggesting that logistics performance is a key determinant of a country's ability to be competitive in global markets, including through joining and moving up in GVCs. This sector therefore also deserves attention. Although attracting foreign investment to small economies is difficult, it may be that improvements in the business climate can help mobilise the private sector to improve the Pacific's ability to connect to global markets, or at least the key regional markets of Australia and New Zealand. Logistics performance in the Pacific countries is weaker than that of Australia and New Zealand: the highest-placed Pacific country, Fiji, has an LPI score of 2.42 on a one to five scale, compared with 3.73 for Australia and 3.42 for New Zealand. There is clear scope to boost economic integration by developing the logistics sector, including through leveraging international integration of key services markets such as transport, freight forwarding and express delivery services.

Concretely, the development of additional maritime and especially air linkages with Australia and New Zealand could be beneficial to the Pacific Islands, in addition to the reinforcement of links among those states themselves. In terms of liner shipping connectivity, Australia's score is over twice as high as that of the best-connected Pacific country (Fiji) – and Australia's score is not high by world standards, as 100 represents the score of the highest country in the index dataset in 2004. For air transport, the picture is even starker: Australia's score is four times that of Papua New Guinea, the best-connected Pacific country.

Second, it is important to recognise that the development of value chains is primarily a private sector agenda. Policy therefore needs to be accommodating to private sector development. A climate of certainty, and a strong business environment, are key considerations for investors, foreign and domestic alike. There is clearly room to improve in terms of the ease of doing business in the Pacific. To take Fiji as an example, although it is moderately ranked overall (88th in 2016), it ranks very low for starting a business (167th), and is over the 100th rank in three other areas. Australia and New Zealand, by contrast, are ranked 11th and 1st respectively in terms of the ease of starting a business, although performance varies widely across the various sub-indices. Easing these burdens will incentivise local businesses to develop and expand, and could potentially help them move gradually into foreign markets.

Part of the private sector development agenda should include measures to help local businesses overcome common export barriers faced by small and medium sized enterprises, including a lack of information on foreign market opportunities and the need to comply with often costly standards and regulations, particularly in sectors like agriculture and food and beverages. Working with international partners

and donor agencies will be important in the context of building up private sector capacity in this area. It may be appropriate to consider targeted interventions such as export promotion to overcome information barriers. This proposal does not equate to large-scale subsidisation of exports, but instead to the correction of a common market failure that particularly affects small-scale firms.

Although the Pacific Islands face considerable challenges due to their geographical situation, it will be important for policy-makers to look at ways in which interventions and regulatory reform can be leveraged to help reduce the burden of distance for business. The immediate priority should be to further intra-regional integration – which is currently limited – along with reinforcement of already relatively close ties with Australia and New Zealand. At the same time, it is important to develop stronger linkages with developing Asia, a particularly dynamic region where there may be significant demand for some Pacific products. A central part of this overall agenda should be improvement of the trade facilitation and logistics environment through appropriate regulatory reform and private sector development, to boost competition and service quality, as well as the quantity and quality of infrastructure. The starting point is the WTO's new Agreement on Trade Facilitation – the Pacific countries would be well served by being ambitious in their Category A notifications, and should in any event conduct needs assessment exercises to identify obligations that will require technical and financial assistance from development partners to implement. Of course, the Agreement is only the starting point for trade facilitation reforms, but coupled with other interventions to address infrastructure deficits and the enhancement of service sector competitiveness it could bear fruit soon.

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