Pacific Island Countries: In Search of a Trade Strategy

Hong Chen
Fujian University of Technology, China
hchen0309@sina.com
https://orcid.org/0000-0002-7408-6244

Lanieta Rauqeuqe
Reserve Bank of Fiji, Fiji
lanieta@rbf.gov.fj
https://orcid.org/0000-0003-4540-9187

Shiu Raj Singh
Asian Development Bank, Philippines
srsingh@adb.org
https://orcid.org/0000-0002-2176-1736

Yiqun Wu
International Monetary Fund, United States
ywu2@imf.org
https://orcid.org/0000-0002-3470-1484

Yongzheng Yang[1]
International Monetary Fund, United States
yyang@imf.org
https://orcid.org/0000-0002-3341-3149

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ABSTRACT

This paper examines the role of international trade for economic prosperity in Pacific island countries (PICs), discusses their comparative advantage, and explores the potential for trade, and tourism in particular, to serve as a locomotive for inclusive economic growth. We find the trade performance in PICs has been generally weak over the past decade, with the exception of resource-rich countries. Small country size and remoteness from global economic centers may have contributed to this relatively poor performance. Using the gravity models to analyze the determinants of merchandise trade and tourism in PICs, we find tourism in these countries faces more favorable conditions for growth than goods exports. Further, we place our analysis in the context of the eastward shift of global economic gravity, focusing on emerging Asia as a source of demand for resource-based goods and services. We argue that the emergence of Asia as a dynamic global economic region presents PICs with an unprecedented opportunity to develop

[1] Corresponding author: International Monetary Fund, 700 19th Street, N.W., Washington, D.C. 20431, USA. Tel: +1 (202) 623-36742, e-mail: yyang@imf.org.

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trade, particularly tourism, although traditional markets will remain important for a long time to come. Moreover, if stronger synergies can be established between tourism, agriculture, and fisheries, Pacific island countries stand a better chance to improve broad-based growth.

JEL Classification: F6

Keywords: Pacific island countries, trade, tourism, agriculture, inclusive growth

1. INTRODUCTION

Trade integration is widely considered to be essential for creating economic prosperity in Pacific island countries (PICs)[2]. This thinking is not without theoretical or empirical foundations. It is well known that domestic markets in PICs are too small to allow them to exploit economies of scale, a disadvantage exacerbated by their geographic remoteness from major global economic centers. Small size and remoteness reinforce each other, leading to high costs of production and trading, and hence contribute to lower price competitiveness of PIC exports. It is thought that, through trade integration, producers in PICs can effectively enlarge their markets and reduce those costs. Historically, a number of relatively small developing economies, such as Hong Kong, Mauritius and Singapore, have managed to develop a manufacturing industry that spearheaded their industrialization and enabled them to significantly increase their per capita incomes through trade integration with larger markets.

Two key questions PIC policymakers face: (1) what needs to be done to facilitate trade integration with the rest of world, and (2) what industries can spearhead this process. Most observers doubt that PICs can or should try to replicate the use of manufacturing as the main platform for trade integration. Given the size and geographic disadvantages of these countries, their comparative advantage lies in industries other than manufacturing, and most likely in a combination of tourism, agriculture, fisheries, and minerals, depending on each country's circumstances. All PICs seem to have potential in tourism, and, for those with abundant and fertile land, also in agriculture. PICs with large fishery resources can extract more economic benefits from these resources through better management and regional cooperation. Papua New Guinea and Solomon Islands have significant commodity resources for production and export, while other PICs are engaged in onshore and offshore exploration. The export of labor services is another area with great potential for several of these countries. With small populations, PICs can export labor services and generate inbound remittances without a large impact on the labor importing countries.

This paper focuses on trade in goods and tourism in PICs and explores the potential for tourism to serve as a locomotive for trade integration and inclusive economic growth. The analysis will be placed in the context of the eastward shift of global economic gravity, focusing on emerging Asia as a source of demand for resource-based goods and services, particularly tourism and agricultural products, both directly and indirectly (namely, supply to the local tourism industry). It should be noted from the outset that PICs' traditional markets will remain important for a long time to come and should be further developed for deeper integration beyond trade in goods and nonfactor services. Nevertheless, PICs should increasingly position themselves to tap into Asia's emerging markets for long-term benefits.

In what follows, we first discuss PICs' comparative advantage in international trade, a crucial first step in formulating a trade strategy (Section 2). We then examine the performance and patterns of PICs' trade in Section 3. Section 4 presents the gravity models, estimation methodologies,

[2] In this paper, PICs include Fiji, Kiribati, the Marshall Islands, Micronesia, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu.

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and data for the analysis of the determinants of PIC merchandise trade and tourism, followed in Section 5 by discussions of the regression results. Section 6 explores PICs' growth potential in tourism in the context of the shifting global economic gravity to Asia, and how a booming tourism industry in PICs can help revive agriculture and support more broad-based growth. Section 7 provides a brief summary of key findings and policy implications.

2. PICS' COMPARATIVE ADVANTAGE

Over the past three decades there has been considerable debate on the paradigms of PICs' economic integration (and small states in general) with the rest of the world. Bertram and Watters (1985) characterized some of the small PICs as having developed into economies that are highly dependent on migration-remittances and aid-bureaucracy. McElroy (2006) saw the potential of tourism in small island states to provide another model of development – small island tourist economies. Baldacchino (2006) extended the characterization of "advantages" of small states to the international political arena, arguing that there are broader strategies that small states can adopt to maximize economic benefits (such as by creating offshore financial centers). Despite these different development perspectives, they are essentially all underpinned by the idea of exploiting comparative advantage accorded to small states by their resource endowments and unique positions in the international system (i.e., being small, often former colonies, and under less scrutiny from international regulatory regimes).

PICs' trade patterns and performances show that they have largely followed their comparative advantage. Evidently, because of PICs' small market size, industries that exhibit strong economies of scale, such as some manufacturing industries (e.g., electronics), face high cost structures in PICs. Remoteness exacerbates this cost disadvantage by making transportation expensive, particularly with increasing fragmentation of production processes that require frequent and timely trade in (and hence transportation of) intermediate products.

With some risk of oversimplification, one can rank broad industry categories in PICs according to the comparative advantage they enjoy. This can be depicted in a "Pacific Pyramid" (Figure 1),[3] with a descending degree of comparative advantage from the base of the pyramid. Where natural resources (minerals, hydrocarbon, fisheries, and forestry) exist, they seem to enjoy the strongest comparative advantage, as can be seen in the importance of mineral and hydrocarbon exports in Papua New Guinea, logs exports in Solomon Islands and tuna exports (via fishing rights) in the Party to the Nauru Agreement countries.[4] The commodity boom of the past decades has strengthened this comparative advantage, although the boom may be over with growth slowdown in China and other major emerging market economies.

Many PICs also seem to enjoy strong comparative advantage in tourism, due to their favorable conditions – tropical climate, sandy beaches, pristine water and distinctive cultures. These conditions offer a considerable degree of product differentiation for Pacific tourism. As in merchandise trade, higher transportation (travel) costs because of remoteness and small market sizes offset part of this advantage, but this does not seem to diminish the overall comparative advantage of PIC tourism. In fact, with growing global demand for tourism, PICs' comparative advantage in tourism appears to be strengthening, as evidenced by the quite impressive growth of visitor arrivals over the past decade in a number of countries.

Agriculture seems to rank third in PICs where land and water resources are abundant. The tropical climate conditions in PICs provide some product differentiation from most other countries, both in terms of product variety and supply timing. However, poor technology, inadequate

[3] The Pacific pyramid has been produced largely in accordance with the ratio/relative importance of PICs' major exports (revealed comparative advantage).

[4] Including Kiribati, the Marshall Islands, Micronesia, Nauru, Palau, Papua New Guinea, Solomon Islands, and Tuvalu.

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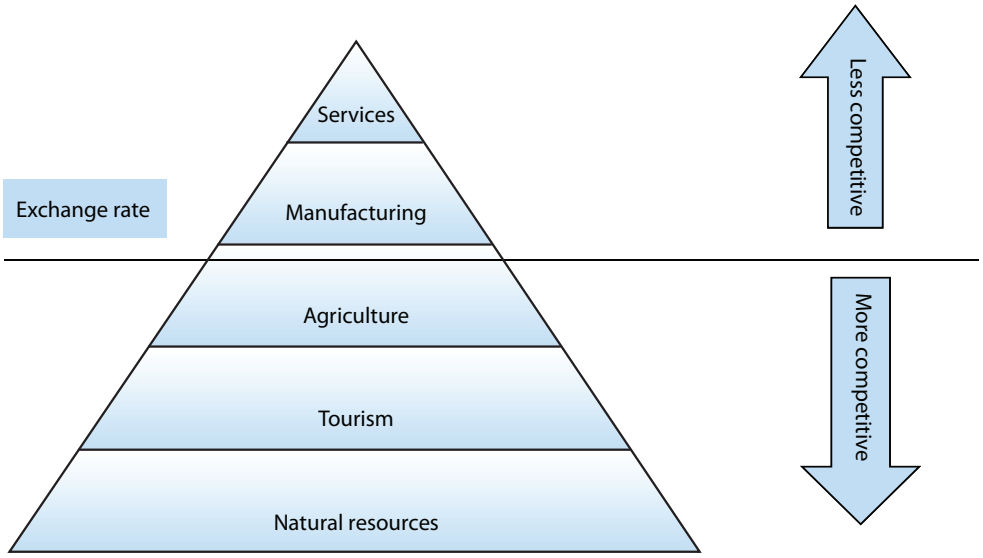
logistical services, and difficulties in accessing customary land have hampered productivity improvement, making PIC agriculture less competitive than it should be. Moreover, relatively high transportation costs as a result of the bulky and perishable nature of agricultural products have weakened this comparative advantage.

The "other services" sector is ranked the lowest in comparative advantage, by virtue of its lower tradability. However, certain industries in this sector produce highly tradable services (back office processing), and with further human resource development and improvement in infrastructure, these industries could become competitive.

Figure 1
Pacific Pyramid of Comparative Advantage



Source: Authors.

At given technology and productivity levels, the exchange rate determines which industries are able to export and how much they can export. As Winters and Martins (2004) point out, PICs have an absolute disadvantage across industries because of the small size of their economies.[5] This has two implications. First, the real exchange rates of PICs are "high" (that is, domestic goods and services are relatively expensive compared with their foreign counterparts), and hence the range of products that can be exported profitably is reduced. Second, a more depreciated exchange rate can help improve competitiveness by raising export earnings in domestic currency, but this would make economic sense from a national welfare point of view only if intermediate costs at international prices do not exceed the world price of the exported product. In other words, there must be domestic value added derived from the production of the export product at world prices before a depreciated exchange rate can improve the profitability of the exporter and the economic welfare of the exporting country. This phenomenon is not unique to small states such as PICs; it also applies to industries in any country that have very high cost structures. What is probably unique about most PICs is that because of the relatively high levels of aid and remittances that many PICs receive, they can run large trade deficits without the need to increase exports to close the gap, even if this can be done with a more depreciated exchange rate. More depreciated exchange rates may allow these countries to export more goods and services (moving up along the pyramid), but they would mean lower living standards in the short run (as imports

[5] Winters and Martins (2004) show that for both clothing and electronic assembly, micro-economies have cost inflation factors of 36 percent and that for hotel and tourism the factor is 58 percent. The latter is driven substantially by high cost disadvantage estimates for personal travel (and the high share of such travel in overall packages).

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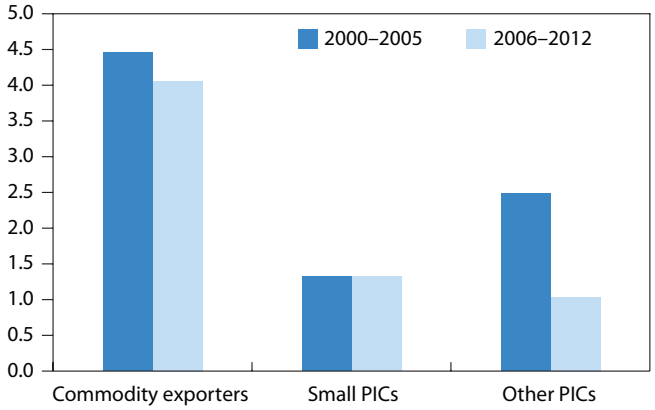
become more expensive) before extra income generated through higher exports can compensate for the lost purchasing power. Moreover, if the productivity of the export sector can improve over time with increased volumes of exports, then the impact of more depreciated exchange rates on exports and welfare can also be much larger over time.

At current exchange rates and productivity levels, the cutoff point for profitable exports in many PICs seems to be somewhere in the agricultural sector. This is borne out by the fact that most PICs do export some agricultural products in addition to tourism but hardly any manufactured products, with the exception of Fiji and Samoa. However, the agricultural sector has performed rather poorly in recent years in most PICs (Figure 2). It is not clear whether this has resulted from the real exchange rate appreciation in recent years or lagging productivity. In several PICs, the real effective exchange rate has appreciated significantly over the past decade (Yang and others, 2013).[6] However, it is entirely possible that both factors could be at work, as a strong exchange rate makes agricultural production and exports relatively unprofitable, reducing the incentive to improve productivity. At the same time, natural disasters, crop diseases and lack of public investment could have slowed productivity growth.

Figure 2
PICs: Growth of Agriculture (In percent)



Sources: Country authorities; and IMF staff estimates.

Except for a few products, the prospects for manufactured exports for PICs are not promising. One can argue that if Mauritius can continue to export textiles and clothing, surely some of the larger PICs such as Fiji and Papua New Guinea can too given their lower wages. Furthermore, PICs are no more remote from the Australian and New Zealand markets than Mauritius is from the United States and European markets. However, the past success of some small countries in manufacturing needs to be placed in a historical context. It is well known that Mauritius and some other small states were helped by the restrictions imposed by the Multi-Fiber Arrangement on other more efficient textile, clothing and footwear exporters at the time, notably Japan, Taiwan, and Hong Kong. Fiji, too, was able to benefit from this in the Australian and US markets, but like many other relatively inefficient producers, as the arrangement was phased out and most-favored-nation tariffs fell in Australia and New Zealand, its textile, clothing and footwear exports have declined.

[6] Most of the PICs' exchange rates are pegged to the currencies of their major trading partners. The relatively higher inflation rates in PICs gradually results in the appreciation of their real effective exchange rates.

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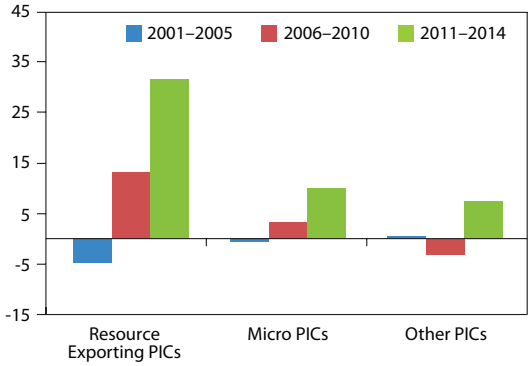
3. TRADE PERFORMANCES AND PATTERNS

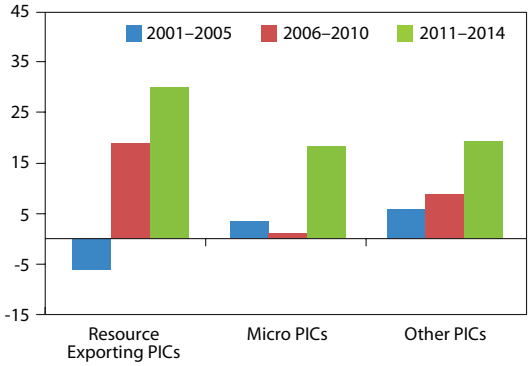
Trade performance has diverged between resource-rich and resource-poor PICs during 2006–2010 and converged more recently. Export growth in the two resource-rich PICs, Papua New Guinea and Solomon Islands, was strong during 2011–2014 (Figure 3), stemming from commodity booms.[7] Micro and other PICs[8] have also seen strong export growth after very slow growth in the previous decade. On the import side, growth largely mirrored export performance (Figure 4).

Figure 3
Real Export Growth (Percent)



Note: PICs = Pacific island countries.
Sources: IMF staff calculations.

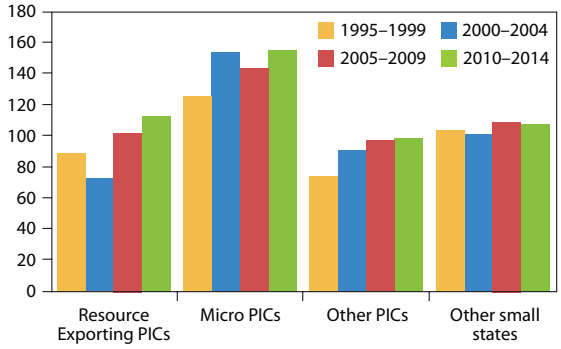
Figure 4
Real Import Growth (Percent)



Note: PICs = Pacific island countries.
Sources: IMF staff calculations.

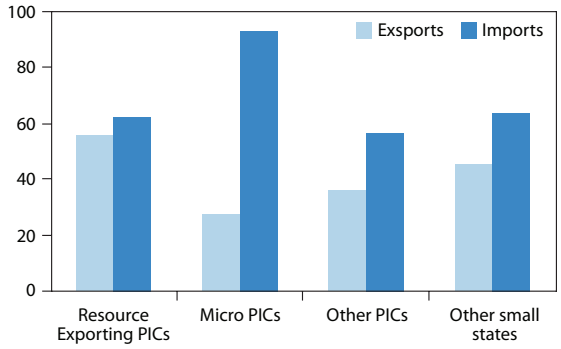
PICs have a high degree of trade openness because of their small size and hence need to trade to meet domestic demand. However, openness has not changed significantly over the past two decades as measured by the trade-to-GDP ratio (Figure 5), except for Papua New Guinea and Solomon Islands, whose openness has been boosted by commodity booms which lasted until 2014. Among non-resource-rich exporters, micro PICs tend to have higher openness, and other PICs lower openness relative to small states outside the region.

Figure 5
Openness Comparisons, 1995–2014
(Goods and services trade; percent of GDP)



Note: PICs = Pacific island countries.
Sources: IMF, World Economic Outlook database.

Figure 6
Trade Balance, Goods and Services, 2003–2014
(Percent of GDP)



Note: PICs = Pacific island countries.
Sources: IMF staff calculations.

However, the high trade openness masks large trade deficits for most PICs, particularly among non-resource-rich exporters. In micro PICs, exports are often a small fraction of imports, but

[7] It is difficult to assess trade growth in PICs, because of the lack of export price statistics suitable for deflating the nominal values of their exports. In Figures 3 and 4, the nominal exports and imports of PICs are deflated using the U.S. import and export price indices, respectively.

[8] Micro PICs include Kiribati, Marshall Islands, Micronesia, Palau, and Tuvalu. Other PICs include Fiji, Samoa, Tonga, and Vanuatu.

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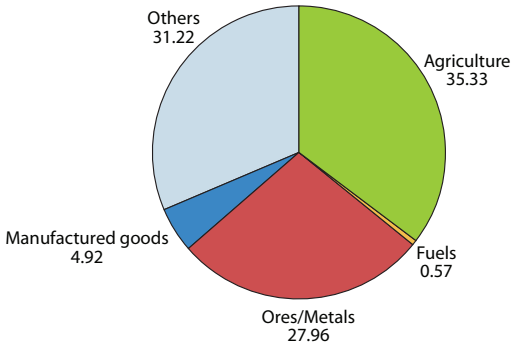
even in some of the larger ones (for example, Samoa and Tonga) trade deficits are large and compare unfavorably with small states outside the region (Figure 6). The sources for financing these deficits vary considerably, but in most PICs, including Fiji, Samoa, and Tonga, remittances and aid are major sources. Most remittances in Kiribati and Tuvalu come from seafarers, but seafaring has been under pressure in recent years. Income from industrial fishing access licenses is also important for some countries, especially for PICs with large exclusive economic zones, such as Kiribati, Papua New Guinea, and Solomon Islands.

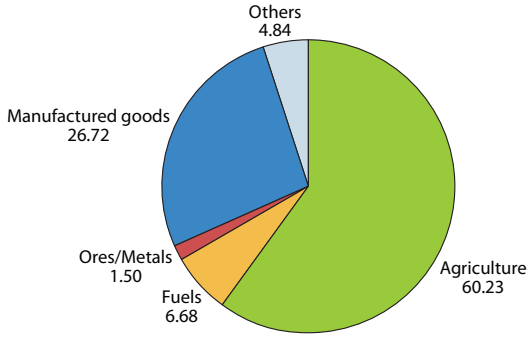
PICs' exports are highly concentrated, reflecting their narrow economic bases. Approximately two-thirds of merchandise exports are primary products, predominantly agricultural products and natural resources (Figure 7). In non-commodity-rich economies (Kiribati, Fiji, Marshall Islands, Micronesia, Palau, Samoa, Tonga, Tuvalu, and Vanuatu) agriculture alone accounts for over 60 percent of total merchandise exports, and even in resource-rich countries agricultural exports are larger than resource exports. Manufactured exports are significant in non-resource-rich countries, but they are very small in resource-rich ones.[9] On the import side, agriculture (including food) is important, although this is more so in non-resource-rich countries, where it accounts for nearly 30 percent of total imports. Fuel imports are also important, again more so in non-resource-rich countries than in others. Agriculture and fuel combined account for nearly half of total imports in non-resource-rich PICs, and over one-third in resource-rich PICs. It is worth noting that resource-rich countries also import more machinery and equipment as a result of their relatively large investment in the resource sector.

Figure7
PICs' Trade Composition

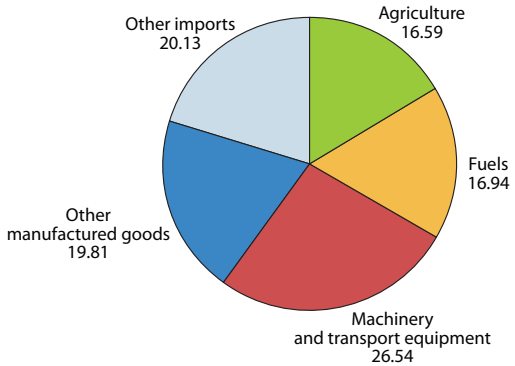
Exports Composition: Resource Exporting PICs



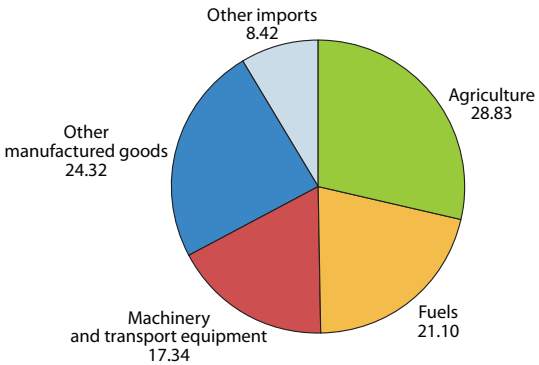
Exports Composition: Non-resource Exporting PICs



Imports Composition: Resource Exporting PICs



Imports Composition: Non-resource Exporting PICs



Note: PICs = Pacific island countries.

Source: World Integrated Trade Statistics – recent year averages.

[9] There may be classification issues with regard to the size of manufactured exports. Compared with non-resource countries, the "others" category is very large and may include some manufactured products.

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PICs' merchandise export destinations are quite concentrated on Australia and New Zealand. But the Australian and New Zealand markets have shrunk significantly, as have the North American[10] and European markets. For non-resource-rich PICs, the Chinese market remains miniscule, but the rest of Asia has gained importance and overtaken Australia, Europe, New Zealand, and North America as the largest export destination, after the rest of the world. The dramatic increase in the importance of the rest-of-the-world market partly reflects growing intraregional trade, but also results from growing market diversification in non-resource-rich PICs as a group.

Turning to trade in services, inbound tourism has gained in importance for several PICs (Figure 8), and this is a bright spot in their trade integration with the rest of the world. The growth of tourist arrivals has averaged 6 percent a year since 2000 – and it is not just Fiji that has done well. Tourist receipts now make an important contribution to several PIC economies (Figure 9). Australia, New Zealand, and the United States account for the bulk of tourist arrivals in most PICs, but the main sources of tourists for Palau have been the Asian economies, notably Japan, Korea, and Taiwan Province of China.[11]

Figure 8
Annual Visitor Arrivals (Thousands)

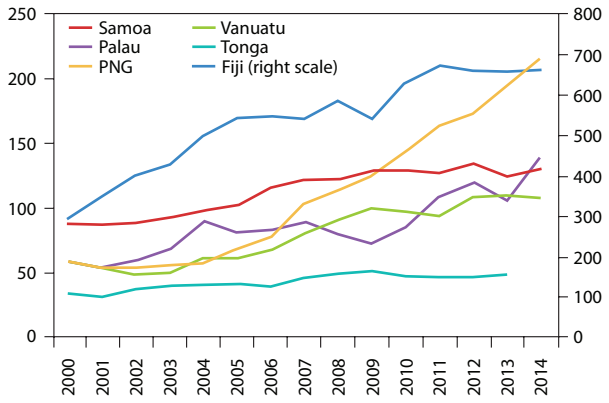
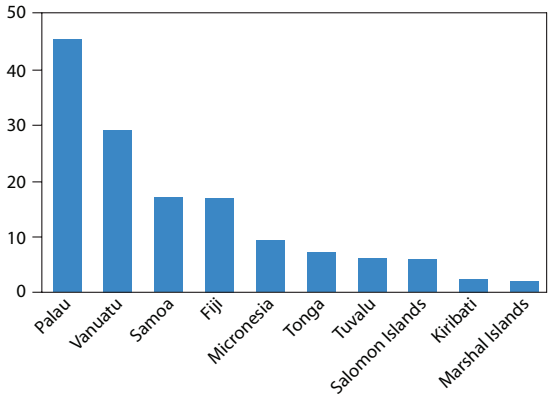


Figure 9
Tourism in the Pacific Islands (Percent of GDP, 2005–2014 average)



Sources: Country authorities; and IMF staff calculations.

4. MODELS, ESTIMATION METHODOLOGIES AND DATA

To examine what drives the growth of PICs' exports of goods and tourism, and the difference in the growth performances of these two sectors, we use one of the most useful empirical approaches to explaining international trade flows, the gravity model. Tinbergen (1962) and Poyhonen (1963) pioneered the notion of explaining trade flows in analogy to Newton's law of gravity, which equates the gravitational attraction of two objects to the product of their masses divided by the square of the distance between them. Hence, the standard gravity model simply takes the trade between two countries as positively related to each economy's GDP and/or population (measure of "mass") and negatively to the distance (measure of "resistance") between countries' 'centers of gravity,' usually capital cities.

[10] In this case, North America includes the United States and Canada.

[11] Palau's total tourist arrivals in recent years have increased rapidly, helped by more chartered flights from Asia.

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Model Specifications

In practice, gravity models often include other variables representing factors that either facilitate or hamper trade between countries, such as preferential trade agreements/regional trading blocs and import tariffs and quotas. Some studies have even included variables such as foreign reserves (reflects successful trade flows from previous years) and the presence of an ethnic minority of one country in another country. In principle, to maximize its explanatory power, a gravity model needs to take into account the special factors that affect trade between countries involved. Given this, our generalized gravity econometric model for trade flows (exports and imports, respectively) for PICs is as follows:

$$\ln T_{ijt} = \alpha_i + \alpha_j + \alpha_1 \ln Y_{it} + \alpha_2 \ln Y_{jt} + \alpha_3 \ln D_{ij} + \alpha_4 F_{ij} + \alpha_5 C_{ij} + \mu_{ijt} \quad (1)$$

where T_{ijt} stands for trade flows from Pacific island country i to partner country j in period t (in the export equation T_{ij} stands for exports, X_{ij}, and in the import equation it stands for imports, Mij); Y_{it} is the GDP of export country i, and Y_{jt} is the GDP of importing country j; D_{ij} stands for distance between country i and country j; F_{ij} is a dummy variable indicating if countries i and j are both signatories of the same preferential trade agreement ($F_{ij} = 1$ if both countries are signatories and $F_{ij} = 0$ if they are not); and C_{ij} indicates if countries i and j share colonial ties, with binary values 1 and 0 indicating existence and absence of such ties, respectively. Parameters α_i and α_j are export country and import country fixed effects, values for α (1 to 5) are the coefficients of corresponding variables, and μ_{ijt} is the white noise error term[12].

With regards to export flows, a higher level of PIC GDP indicates higher productive capacity to export, and a higher level of trading partners' income translates into higher import demand. Additional explanations for the inclusion of GDP in equation (1) are that since the presence of economies of scale induces production of differentiated products, volume of trade will be influenced by economic size that is measured by GDP (Helpman and Krugman 1985). Since one country's imports are its trading partners' exports, the GDP variables play similar roles in the imports equation. Hence, α_1 and α_2 are expected to be positive for both exports and imports.

PICs are expected to trade more with countries for which resistance from distance is lower. Rahman (2003) noted that physical shipping costs, time-related costs and costs of (cultural) unfamiliarity are all costs borne in doing business at a distance. Since distance between capitals of pairwise trading countries is a proxy for transportation costs in our gravity model, an increase in distance between countries raises these costs and therefore reduces trade. Thus, β_3 is expected to be negative. The coefficients δ_1 and δ_2 are expected to be positive as trade arrangements and colonial history are taken to facilitate trade between countries. We also considered relative prices[13] in the equation since the link between trade and relative prices is well supported by empirical evidence (Harris and Matyas, 1998). While the estimated coefficients of relative price indices turned out to be negative in our models, the estimates were highly insignificant.

[12] Due to data limitations, our gravity model specifications do not include several variables that could have impacts on trade flows, including exchange rate variability, labor costs, terms of trade, among others. Bergstrand and Egger (2013) provide a survey on the role of frictions in international trade and the contribution of the gravity equation towards understanding the determinants of trade flows.

[13] We also considered the relative price index $RELRER^j_X = RER^j_X \Big/ \sum_{k \neq X} \alpha_k RER^j_k$ where j is importer, X is exporter, $RER = \dfrac{CPI_X}{CPI^j} \Big/ \dfrac{\$_X/\$_{US}}{\$^j/\$_{US}}$, and α_k is share of exports to country j from country k. The index is designed to capture the effects of competition among PICs which produce similar products, rather than between PICs and their non-PIC trading partners as these partners tend to produce goods and services that often do not compete with those from PICs.

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The tourism equation has a structure similar to the goods model but with an expanded set of explanatory variables.

$$\ln V_{ijt} = \beta_0 + \beta_1 \ln N_{jt} + \beta_2 \ln YPC_{jt} + \beta_3 \ln D_{ij} + \beta_4 L_{ij} + \beta_5 S_i + \beta_6 U_{it} + \varepsilon_{ijt} \quad (2)$$

where V_{ijt} stands for the number of tourist arrivals in PIC i from country j in period t; N_{jt} is the population of source country j; Y_{jt} is the GDP per capita of source country j; D_{ij} is the distance between PIC destination country i and source country j; L_{ij} is a dummy variable indicating if countries i and j share a common language ($L_{ij} = 1$ if the two countries share a common language, and $L_{ij} = 0$ if they do not); S_i stands for land surface area of PIC destination i, and U_{it} is the share of urban population in PIC destination i, a proxy for domestic connectivity for tourist travel. β's are the coefficients of corresponding variables, and ε_{ijt} is the white noise error term.

GDP per capita plays a similar role in the tourism model as GDP does in the goods model, and distance acts exactly the same way in both models. The population of source countries is expected to contribute positively to outbound tourism, as is a common language. The surface area of the destination PICs is included to capture the impact of the variety of tourism activities in these PICs – a geographically larger destination equates to greater product variety and attracts higher visitor arrivals. The inclusion of the share of urban population as a proxy for domestic connectivity for tourist travel is based on the consideration that proximity of source countries to tourism destinations may not really matter if harsh geographical conditions or limited infrastructural facilities in the latter hamper tourist activities. Given this, the higher the level of urbanization is, the greater the appeal of these PIC destinations to tourists.

In this analysis, we also tested proxies for relative tourism prices (reciprocal of the purchasing power parity conversion factor), similar to Narayan (2004) in the case of Fiji, and synergies between tourism and goods trade (sum of annual bilateral trade in goods between the countries divided by both countries' GDP). We also tested the impact of robbery rates as an indicator of travel risk despite the uncertain quality of the source data. Nevertheless, all three variables turned out to be insignificant.

Data and Estimation Methodologies[14]

Data for the trade flows (goods) cover six PICs (Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu) and their 100 trading partners over 1990–2012. Equation (1) is estimated with the fixed effects least squares dummy variables estimator (henceforth FELSDV, also referred to as the two high-dimensional fixed effects estimator) and two-stage FELSDV (henceforth TSFELSDV) to control for the endogenous effect of PICs' real GDP if it exists, for exports and imports respectively. The null hypothesis of no fixed effects of exporting countries and importing countries is rejected at the 1 percent level with the *p*-value of zero for *F* critical statistic greater than the observed *F* statistic. This points to the necessary employment of the FELSDV estimator. In the TSFELSDV estimation, gross fixed capital formation (investment) is the external instrumental variable to control randomness of $\ln Y_{it}$ in the first stage of estimation, which is found to be a strong instrument since the Wald test yields an *F* statistic of more than the threshold value of 10.

Since there is no significant difference between the FELSDV and TSFELSDV estimates, the null hypothesis of exogeneity is not rejected; namely, $\ln Y_{it}$ is not endogenous in models explaining PICs' exports and imports. This leads to the conclusion that the FELSDV estimates are unbiased and consistent. Time effects are also considered and captured by including year dummy variables.

[14] Unit root tests are reported in Annex II.

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The coefficients of time dummies are not significant in the merchandise exports and imports regressions, hence results are not presented but are available upon request. Estimation results for goods exports and imports are summarized in Table 1.

Table 1
Estimation Results of the Gravity Model for PICs' Merchandise Exports and Imports

Independent Variable	Dependent: ln(exports)		Dependent: ln(imports)	
	FELSDV	TSFELSDV	FELSDV	TSFELSDV
PICs Real GDP, $\ln Y_{it}$	0.27 (2.95)	0.19 (1.62)	0.81 (12.93)	0.91 (11.23)
Trading Partners' Real GDP, $\ln Y_{jt}$	0.44 (10.78)	0.44 (9.96)	0.28 (9.69)	0.29 (8.92)
Distance, $\ln D_{ij}$	-2.32 (-15.90)	-2.36 (-15.47)	-1.65 (-15.27)	-1.74 (-15.17)
Preferential Trade Agreement, F_{ij}	0.39 (3.40)	0.35 (2.67)	0.40 (5.67)	0.36 (4.43)
Colonial Ties, C_{ij}	1.31 (8.89)	1.28 (7.73)	0.90 (7.73)	0.81 (6.38)
Sample Size	3028	2585	4104	3493
Instrumented Variable	-	$\ln Y_{it}$	-	$\ln Y_{it}$
External Instruments	-	investment	-	investment
F-stat for Instruments' Significance	-	5554.57	-	5554.57
F (H_0: $\alpha_i = \alpha_j = 0$)	13.15	-	42.38	-
R^2	0.640	0.650	0.763	0.768

Note: *t*-statistics are in brackets; FELSDV = fixed effects least squares dummy variable; PICs = Pacific island countries; TSFELSDV = two-stage fixed effects least squares dummy variable.

Source: Authors' calculations.

In equation (2), destination country's urban population ratio, U_{it}, which to a great extent reflects a country's urbanization level, may be endogenous because development of the tourism industry may in turn speed up the country's urbanization progress. If this is the case an instrumental variables estimator should be used.

Data for the analysis of tourist arrivals are based on a strongly balanced panel covering five PICs and nine source countries over 2000–14. Equation (2) is estimated with the ordinary least squares (henceforth OLS), two-stage least squares estimator (henceforth TSLS) and the FELSDV estimator. The TSFELSDV estimator was also tried, and it yielded the same result as the FELSDV: that U_{it} is not significant. We also include time effects in the FELSDV regression by adding year dummy variables, and find that time dummies are highly significant.

Estimation results for PICs' tourist arrivals are summarized in Table 2, which shows that the FELSDV estimator with time effects is more appropriate than the least squares (LS) estimators since the null hypothesis of no fixed effects is rejected at the 1 percent level. Although LS estimators provide more information about determinants of tourist arrivals in PICs, the FELSDV with time effects has a better goodness of fit, which means that heterogeneities of destination countries and source countries are more than the additional three factors identified in the LS estimates; namely, the destination country's urban population ratio, the destination country's land surface, and common language.

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Table 2
Estimation Results of the Gravity Model for PICs' Tourist Arrivals

Independent variable	OLS	TSLS	FELSDV	FELSDV time effects
Source country's total population, $\ln N_{jt}$	0.20 (3.41)	0.22 (3.29)	1.92 (1.82)	8.09 (5.75)
Source country's per capita GDP, $\ln YPC_{jt}$	0.95 (9.86)	0.77 (6.30)	1.38 (5.15)	2.56 (8.00)
Destination country's urban population ratio, U_{it}	0.08 (20.00)	0.11 (9.87)	-0.005 (-0.74)	-.0001 (-0.02)
Distance, $\ln D_{ij}$	-1.43 (-8.98)	-1.68 (-8.60)	-2.81 (-12.59)	-2.78 (-13.24)
Destination country's land surface, $\ln S_{it}$	0.17 (5.83)	0.21 (6.02)	-	-
Common language, L_{ij}	1.48 (10.04)	1.60 (9.34)	-	-
Year2001				-.16 (-1.29)
Year2002				-.34 (-2.58)
Year2003				-.54 (-3.86)
Year2004				-.70 (-4.60)
Year2005				-.83 (-5.05)
Year2006				-.97 (-5.36)
Year2007				-1.06 (-5.37)
Year2008				-1.16 (-5.50)
Year2009				-1.23 (-5.65)
Year2010				-1.36 (-5.83)
Year2011				-1.49 (-6.02)
Year2012				-1.63 (-6.21)
Sample size	273	273	273	273
Instrumented variable	-	U_{it}	-	-
External instruments	-	Destination country's per capita GDP	-	-
F-stat for instruments' significance		45.62	-	-
Hausman F stat (p-value)		16.38 (0.000)		
F (H_0: $\alpha_i = \alpha_j = 0$)	-	-	65.62	76.22
Adjusted/Centered R^2	0.7601	0.6885	0.9424	0.9510

Note: t-statistics are in parentheses; - = excluded variable; FELSDV = fixed effects least squares dummy variable; OLS = ordinary least squares; PICs = Pacific island countries; TSLS = two-stage least squares. Year2000~Year2011 are dummy variables with value 1 for the specified year and 0 for the rest years.

Source: Authors' calculations.

5. GRAVITY FOR PACIFIC GOODS AND SERVICES: ESTIMATION RESULTS

Looking first at the estimated exports equation, a striking result is the low elasticity of PIC exports with respect to their GDP (Table 1).The estimated coefficient indicates that, on average with each percentage increase in the GDP of the exporting country, exports rise only by 0.27 percent (based on FELSDV results).Thus, there is a tendency for export growth to lag behind output growth in PICs, indicating a strong inward orientation of economic activity. The elasticity of PIC exports with respect to importing country GDP is also low, but considerably higher than

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the elasticity with respect to PICs' own GDP. This low elasticity may reflect the fact that PIC exports are primarily commodities, such as agricultural products and minerals. For agricultural products, lack of product differentiation or processing could also be associated with low income elasticities of demand. Even with this low elasticity, income growth in importing countries should have helped PICs narrow their trade deficits. This is because in recent years their trading partners have grown much more rapidly (Papua New Guinea and Solomon Islands being exceptions).

Remoteness is a major barrier to export growth in PICs. Based on the estimated coefficient on distance,[15] for each percentage increase in distance to an export market, PICs' exports decline by about 2.3 percent. Take Fiji and Tonga for illustrative purposes. Since Tonga's distance to Australia (3,585 kilometers) is 11 percent further than Fiji's (3,224 kilometers), and all else equal (that is, even if Tonga had the same income level and its country size was the same as Fiji's), Tonga's exports to Australia would be 25 percent lower than Fiji's.

The regression results also show that preferential trade agreements generally have a positive impact on bilateral trade. However, the results vary across individual agreements, with the Melanesian Spearhead Group Trade Agreement[16] and the South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA)[17] showing positive effects but the Lomé Convention, Cotonou Agreement, and the Economic Partnership Agreements[18] having no significant effects. The impact of being a member of a preferential trade agreement on PICs' bilateral trade can be quite large. In the case of Melanesian Spearhead Group, for instance, bilateral exports are estimated to be 49 percent higher, while in the case of SPARTECA, bilateral exports are 115 percent higher. It should be noted, however, that bilateral trade among most PICs is mostly very low, so even a large percentage increase in bilateral trade would translate into only a small impact on overall trade.

Additionally, the welfare implications of the Melanesian Spearhead Group and SPARTECA can be very different despite both having a positive impact on exports. As a nonreciprocal agreement, SPARTECA essentially allows PICs to reap rents generated by tariffs and quotas imposed on Australia and New Zealand's imports from non-PICs. Thus, there is little doubt that increased exports under SPARTECA translate into a welfare improvement for PICs. On the other hand, the Melanesian Spearhead Group Trade Agreement is reciprocal, and any increase in bilateral trade is a result of reciprocal tariff reductions among Melanesian Spearhead Group members. It is well known that such agreements can result in trade diversion as well as trade creation, and that the trade diversion effect is more likely to dominate the trade creation effect in free trade agreements that involve only small trading partners, a point emphasized by Duncan (2008).[19]

Colonial ties also seem to have a positive impact on PICs' exports to their former colonial powers. On average, and other things being equal, a PIC exports 134 percent more to a former colonial power than to other countries. Such a positive impact on exports reflects the cultural (including language), political, and business ties that bind countries with their former colonial powers. However, it should be noted that the estimated effects of colonial ties are based on historical experience, and it is possible that such effects will diminish over time as trade preferences accorded to former colonies are gradually eroded or phased out.

Results from a similar import equation show that PICs have a tendency toward a deteriorating trade balance (Table 1). The elasticity of their imports with respect to their GDP is estimated to be 0.81, substantially higher than the elasticity of exports to their GDP. This suggests that as these

[15] Distance is measured in kilometers between the capital cities of the exporting and importing countries.

[16] A sub-regional free trade agreement which became effective in 1993 and currently comprises Fiji, Kanak and the Socialist National Liberation Front of New Caledonia, Papua New Guinea, Solomon Islands, and Vanuatu.

[17] Effective in 1981, this agreement provides non-reciprocal duty and quota free entry for PIC goods exports into Australia and New Zealand.

[18] As part of the African, Caribbean and Pacific group, PICs have preferential access to the EU market under the **Lomé** Convention, its successor Cotonou Agreement and interim Economic Partnership Agreements (Fiji and Papua New Guinea only).

[19] Put differently, if Melanesian Spearhead Group countries were dominant trading partners of each other, trade liberalization under the group's trade agreement would have effects similar to unilateral liberalization, and, hence, the trade diversion effect would be limited.

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economies expand, import growth tends to outpace export growth, and hence nontrade accounts (namely, services, income, and financial accounts) will need to generate a sufficient surplus to maintain the initial balance of payments position. This in turn will require either structural adjustment to increase goods and services exports and/or reduce imports unless external inflows (aid, remittances, and capital) continue to increase.

Other dependent variables have similar and expected impacts as those for the estimation of exports. The elasticity of imports with respect to trading partner GDP is positive but very low. This reflects the fact that, on average, PIC economies have been growing more slowly than their major trading partners and have not been able to absorb their exports at the same pace as the growth in their trading partners. This implies that PICs have become less important export destinations for their trading partners and increasingly marginalized in international trade. Another significant result is that distance seems to have a smaller negative impact on the imports of these countries than their exports. This may suggest that import consignments are larger and, therefore, their cost of shipping is lower. Preferential trade agreements have a magnitude of impact on the imports of PICs that is similar to that on their exports, but the colonial ties seem to be less important for imports than for exports. This result probably points to the wider range of options available for sourcing imports than diversifying export destinations.

Turning to the tourism equation, the regression results highlight the importance of establishing tourism links with large and fast growing source countries and increasing destination awareness (Table 2). All else being equal, the source country's population growth will translate into tourism growth in PICs. Such facts also suggest that there is greater potential to attract tourists from large countries. On the other hand, distance has a smaller negative impact on tourism than on goods exports. For each percentage increase in distance from a destination country, tourist arrivals decline by 1.4–2.8 percent (compared with 2.3 percent for goods exports), reflecting distance-induced increases in travel costs. Clearly, this relationship may be nonlinear and only holds up to a certain distance.

Income is the most important force driving tourist arrivals from a source country. The results indicate an income elasticity of close to unity with respect to source-country income. This is more than twice that for the import-country income elasticity for goods exports. Nevertheless, the estimate indicates that, on average, tourism in PICs is not a luxury service[20]. This seems to be consistent with anecdotal evidence that Australian tourists tend to go to North America, Europe, and Asia when they have more disposable income, whereas the Pacific is more likely to be regarded as a budget holiday destination. However, it is quite possible that the income elasticity varies among income groups and age cohorts and source countries. Information on such variations can be useful for tourism marketing and should be examined in country-specific research.

The results also indicate that a common language shared with a source country helps raise tourist arrivals. A PIC can expect 148 percent more tourist arrivals from a source country that shares its language than from a country that does not. Underlying the role of common languages could also be familiarity with destinations, and hence the availability of information about PICs in source country languages could play an important role in attracting tourists. Training tour operators and local tourist guides to speak source-country languages could also help. Larger land surface in destination countries is also found to help attract more tourists, probably reflecting the higher capacity of larger countries to receive tourists and the greater diversity of their destinations. However, the role of land surface may also reflect the attraction of a greater range of tourism products and point to the possibility of the gains of collectively marketing

[20] Song and Li (2008) provide an extensive survey of estimated elasticities of demand for tourism. Most estimates surveyed are greater than one. Eilat and Einav (2004) suggest that income elasticities for tourism in high-income countries tend to be higher than in lower-income countries. Their estimate indicates that the elasticity for high-income countries ranges between 1.29 and 1.55, and between 0.41 and 1.48 for lower-income countries.

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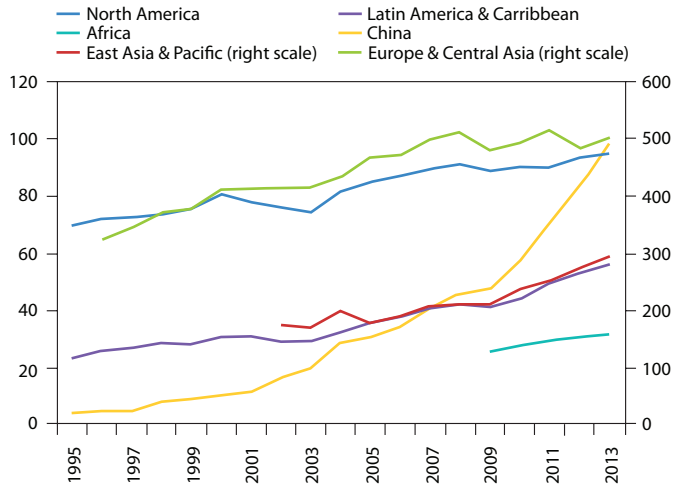
a wider range of tourism products and attractions in PICs. Domestic connectivity, as measured by the degree of urbanization, also helps increase tourist arrivals, confirming the importance of general infrastructure for tourism development, although the estimated impact appears to be relatively small.

6. TAKING ADVANTAGE OF THE SHIFTING GRAVITY

The results of the gravity model analysis suggest that tourism in PICs faces more favorable conditions for growth than goods exports. The estimated demand elasticity of close to unity with respect to source-country income means that demand for PIC tourism can expand over time at a similar rate of income growth in source countries, and the smaller negative impact of distance on tourist arrivals helps moderate the disadvantage of remoteness. The common English language and colonial ties shared with traditional source countries such as Australia and New Zealand will remain a positive factor for tourist arrivals from these countries. Moreover, the wide use of English in PICs also helps minimize language barriers with Asian tourists, for whom English is the most common second language.[21]

Figure 10
International Departures (Millions)



Sources: World Bank database; and UN World Tourism Organization.

However, it is the shifting global economic gravity that is likely to bring the greatest opportunities for tourism in PICs. Asia's emergence as a global economic center has changed the landscape for international tourism over the past two decades. Traditionally, Europe and the Americas dominated the global tourism market, both as sources and destinations for international tourism. However, according to United Nations World Tourism Organization statistics (UNWTO 2013), while Europe remains the largest source of tourists globally, Asia and the Pacific has emerged as the second largest source, overtaking the United States. The region accounted for 23 percent of global tourist departures in 2012, an increase of 10 percentage points from 1990 (Figure 10). Tourists from China have increased particularly rapidly, with close to 100 million of its citizens traveling overseas in 2013. China now has more citizens travelling abroad than any other country. The World Tourism Organization (2013) projects that world tourist arrivals will continue to grow robustly over the next two decades, at 3.3 percent per year and reaching

[21] Bolton (2008) discusses the exponential increase in Asians knowing and speaking English in recent years.

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1.8 billion by 2030. International tourist arrivals in emerging markets are projected to grow twice as fast (4.4 percent) as in advanced economies (2.2 percent). Although there is no forecast by source country or region, departures from emerging markets are likely to outpace those from advanced economies, driven by their higher population and income growth.

Emerging markets in Asia could become a major source of tourists in PICs if the right conditions are created there, with China deserving special attention for its large population and rapid income growth. Since 1995, China's travel departures have increased at an annual rate of 15½ percent. Song (2013) forecasts that travel departures could reach 345 million by 2020. Song's implied 19½ percent average annual growth appears to be overly optimistic given the recent economic slowdown. But it is quite likely that the number of tourists from China will still grow rapidly over the medium term, and potentially by about 6.5 percent a year, matching the average forecast of China's GDP growth (based on IMF April 2017 World Economic Outlook forecasts). However, household spending is likely to grow significantly faster than GDP as China rebalances growth toward greater reliance on domestic consumption, which would also lead to real exchange rate appreciation over time and therefore more affordable overseas travel.

Tourists from China have come in waves, and these waves appear to have just arrived in the Pacific. The first wave tended to concentrate on neighboring countries, particularly in northeast and southeast Asia. Over time and as the households grew richer, more Chinese tourists traveled to North America and Europe, and the next wave is likely to reach farther afield as nontraditional destinations are explored. Starting from an admittedly low base, tourist arrivals in the Pacific have surged over the past few years (Figure 11). The challenge for PICs is to sustain strong growth into the future. In this regard, Maldives provides a benchmark for PICs. Since 2005, Maldives has attracted tourists from China at an astonishing growth rate of 53 percent a year, surpassing 350,000 arrivals in 2014, according to Maldives government data. This represents more than a quarter of total tourist arrivals, with China now the country's biggest source of tourist arrivals. High-end tourist facilities, diversification, and improvements in service, innovation, and marketing to cater to tourist demand have allowed Maldives to create a niche market that is now central to the success of its tourism industry.

PICs need to create similar conditions to grow tourism from China and Asia in general. These include raising awareness of the Pacific as a tourism destination through marketing and other forms of information dissemination; more frequent and affordable flights; improved tourism infrastructure and services (for example, hotels and restaurants); and a greater variety and quality of tourist products. Obviously, the starting point varies considerably across PICs, and bottlenecks differ from country to country. Smaller and more remote PICs have a lower starting point and face tougher challenges. A small market makes it difficult to attract frequent and affordable flights and yet without such flights investment in tourist infrastructure will not be viable and tourist products will not develop. As such, an integrated approach to developing tourism with a concerted effort by public and private sectors may be warranted. In particular, the government needs to create the necessary conditions for domestic and foreign investment, including facilitating land leases for tourist infrastructure development. Scope also exists for intergovernmental or regional cooperation to overcome diseconomies of scale, such as through joint marketing and improved cooperation in aviation.

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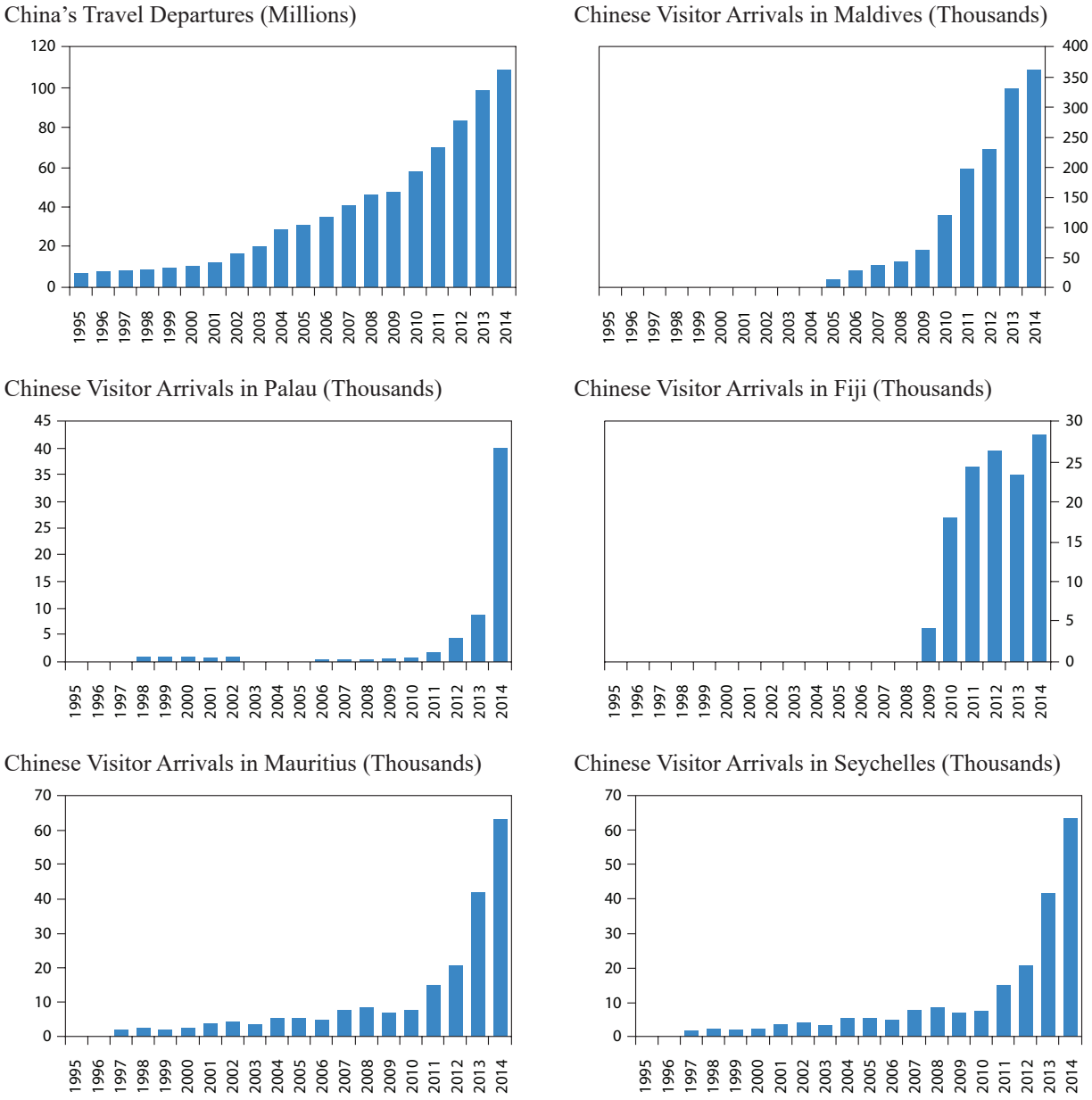
Figure 11
Visitors from China, 1995−2014



Sources: Country authorities; and IMF staff calculations.

Securing a share of the Asian tourism boom is critical to the future of tourism in PICs. Figure 12 shows how tourist arrivals in Fiji could evolve with different degrees of success in attracting tourists just from China. Such rapid tourism growth, in turn, could significantly boost the agricultural sector in PICs, especially if synergies between tourism and agriculture can be exploited. PICs have long recognized the benefits of these synergies, but have been slow to exploit them. The linkage is particularly important for small states, as agricultural exporters face high transportation costs in selling their products to overseas markets, and tropical produce often faces more stringent sanitary and phytosanitary restrictions. By supplying the domestic tourism industry, producers could avoid the disadvantages of long distance and sanitary and phytosanitary restrictions. And those close to tourism sites could save significantly on domestic transportation costs, which are often high.

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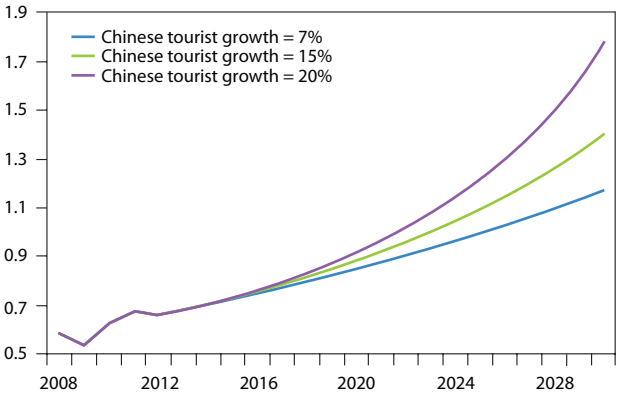
Figure 12
Projection of Chinese Visitor Arrivals in Fiji (Millions)



Sources: Country authorities; and authors' projections.

The linkage between tourism and agriculture is important because it not only offers a way to reduce export costs and barriers, but also serves as a critical strategy to foster inclusive growth. Despite weak performance over the past decade, agriculture is by far the largest sector of most PIC economies and provides employment and income for more households than any other sector. Thus, linking agriculture to tourism can help revive agriculture and broaden the base for economic growth.

While there is little information about the current state of agricultural supply to the tourism industry, anecdotal evidence suggests that there is significant potential. A study based on a "farm to table" project by the University of the South Pacific cites an estimate that 70 percent of food for the tourism industry in the Pacific is imported (Gibson, 2013). The overall retention rate for tourist expenditure is about 44 percent in Fiji; that is, for each dollar a tourist spends, 56 cents leaks out of Fiji through spending on imported goods and services, a large portion of which is food and agricultural products. Rogers (2012) notes that with the exception of pork, virtually all meats are imported in Tonga and Samoa, particularly for upper-end hotels and restaurants because local producers cannot supply these products in required volumes with consistent quality. Similarly, hotels and restaurants often rely on imported vegetables and fruits. Imports of food products are inevitable in PICs and help reduce costs given the undiversified production base and climate conditions in the region. Even so, there seems to be considerable scope to supply products suitable for cultivation in the tropical climates of these countries. What has prevented the development of a supply chain to meet this local demand and consistently supply quality needs to be examined.

Once domestic producers can supply local hospitality industries with adequate volumes and consistent quality, local producers will be in a stronger position to export. The larger volumes and higher quality would effectively reduce the cost of agricultural exports and make PICs more competitive in overseas markets, as witnessed in the strong demand for Vanuatu's beef exports. In fact, overseas markets and domestic hospitality markets can be highly complementary. Seasonality of certain vegetables and fruits has been a major issue for local hotels and restaurants, but this is because small production volumes make it economically unviable to develop local storage facilities. Once production volumes reach critical mass, it will become more cost effective to develop such logistics to facilitate exports.

Agricultural development can also help enhance the tourism industry. As Rogers (2012) points out for Samoa and Tonga, agricultural systems are an integral part of the natural environment that provides the aesthetic context for a tourist destination. Thus, it is important to preserve the essential features of Pacific agricultural systems to ensure ecological sustainability and commercial value for tourism. Greater use of agricultural systems can enhance tourist experiences

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as well as increase local value added. However, care should be taken in developing tourism infrastructure to protect the agricultural environment. Similarly, agricultural development should minimize pollution and avoid damage to tourist attractions. Organic farming has often been advocated both as a way to produce higher value added products by product differentiation as well as to better preserve the natural environment. This requires a holistic approach to development planning and coordinated efforts between agricultural and tourism authorities.

7. CONCLUDING REMARKS

Considerable efforts have been made to advance trade integration in PICs, but the outcome has been mixed. Large preference margins offered by former colonial powers in earlier years appear to have helped boost certain exports such as sugar, textile, clothing, footwear products, and auto parts. But as preference margins have fallen and Australia's auto manufacturing industry declines, PIC's exports have suffered. Meanwhile, weak domestic supply capacity and rigorous quarantine requirements continue to hamper agricultural exports. PICs have increasingly turned to intraregional integration to boost export demand, but lack of trade complementarity among PICs and slow implementation of tariff reductions mean that benefits may be limited, and their impact may not even be welfare-improving because of trade diversion. Furthermore, the likely uneven distribution of trade expansion in favor of larger countries in the region may lead to tensions that continue to hinder trade liberalization.

Asia's economic emergence globally further reinforces the rationale for unilateral trade liberalization in PICs. Australia and New Zealand will remain major sources of imports for these countries for a long time to come, but the rapidly growing importance of Asian imports has increased the chances of trade diversion arising from the Pacific Agreement on Closer Economic Relations (PACER) Plus agreement[22]. Some of the major benefits for PICs from this are likely to be in development assistance to improve their domestic supply capacity. This is especially so in agriculture and tourism, as well as in a scientifically based relaxation of quarantine requirements on Pacific produce. Perhaps the largest benefits lie in an expanded and more institutionalized temporary migration scheme that would allow PICs to export labor services, especially by the small countries that have limited capacity, at least in the short to medium term, to export goods and non-factor services. All these should be included in the final PACER Plus agreement, but PICs should at the same time pursue unilateral liberalization to avoid trade diversion.

While continuing to expand trade, temporary migration schemes and other forms of economic cooperation with traditional trading partners, PICs should make greater efforts to diversify their trade into Asian markets. This will not be easy, as shown by the limited progress of non-resource rich PICs in penetrating the Chinese market. Apart from domestic supply constraints, this is partly because of ever closer trade integration in Asia that has enabled Southeast Asian countries to supply increasing quantities of tropical produce to Northeast Asian countries. To improve competitiveness, PICs will need to make significant progress on two fronts. The first is to improve agricultural productivity. At the micro level, this requires, among other things, supporting infrastructure and services, such as extension services and efficient marketing arrangements, and land tenure systems that provide secure access to land for productive purposes. At the macro level, countries need to maintain exchange rates at appropriate levels through macroeconomic policies that keep inflation low and make greater use of aid and remittances for productive investment, and minimizing the potential Dutch disease effect. And second, PICs should negotiate a more level playing field in Asian countries, perhaps collectively, through freer market access and the extension of existing preferential access in some markets, such as China.

[22] This trade agreement is designed to broaden PICs' intraregional trade integration to include trade with Australia and New Zealand on a reciprocal basis.

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The prospects for diversification into Asian markets are much more promising in tourism, and here policies should focus on creating conditions for private businesses to thrive. PICs have comparative advantage in tourism, despite their remoteness from major global economic centers. As global economic gravity moves eastward, it presents PICs with an unprecedented opportunity to develop tourism. Surging tourists from China and other Asian countries have already begun to benefit PICs, but this could be the beginning of a longer boom. To seize the opportunity, PICs must market themselves proactively. Countries need to attract foreign investment and know-how in building and upgrading tourism infrastructure. Again, providing secure access to land leases will be important. Regional cooperation in marketing and trade-related infrastructure could help overcome diseconomies of scale. Governments could help reduce entry barriers for entering the tourism market faced by local businesses, particularly small and medium sized enterprises; and help promote Pacific cultures as a tourist attraction, which would benefit local communities.

Strong tourism growth could also provide much needed support to agriculture in PICs, and policies should actively support the establishment of agriculture-tourism linkages. In the past, some PICs may have experienced competition between agriculture and tourism, particularly in the use of land and labor. Furthermore, strong exchange rates that are supported by tourism earnings may have had a negative impact on agricultural production and exports. Yet if the linkages are made, a tourism boom could also generate demand for local food and other products, as there are considerable synergies to be exploited that would benefit both sectors. Government policies should encourage initiatives to build supply chains to ensure a consistent supply of food and agricultural products to the tourism industry with consistent quality, and the unique Pacific agricultural systems should be further integrated into local tourism products. Strong growth of both tourism and agriculture would provide a sound basis for inclusive growth.

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ANNEX I: COUNTRY LIST AND DATA DESCRIPTION

Annex Table I-1
100 Importing Countries of PICs' Goods, 1992–2014

Algeria	Côte d'Ivoire	Ireland	Netherlands	Solomon Islands
Australia	Denmark	Israel	New Zealand	South Africa
Austria	Dominica	Italy	Nigeria	Spain
Bahrain, Kingdom of	Dominican Republic	Jamaica	Norway	Sri Lanka
Bangladesh	Ecuador	Japan	Oman	Sweden
Barbados	Egypt	Jordan	Pakistan	Switzerland
Belarus	Estonia	Kenya	Panama	Tanzania
Belgium	Fiji	Kiribati	Papua New Guinea	Thailand
Brazil	Finland	Korea, Republic of	Peru	Tonga
Brunei Darussalam	France	Kuwait	Philippines	Trinidad and Tobago
Bulgaria	Gabon	Lao People's Democratic Republic	Poland	Tunisia
Cambodia	Germany	Latvia	Portugal	Turkey
Canada	Greece	Lebanon	Qatar	Tuvalu
Chile	Guatemala	Lithuania	Romania	Ukraine
China P. R.	Haiti	Macedonia, FYR	Russian Federation	United Kingdom
Colombia	Honduras	Malaysia	Samoa	United States
Costa Rica	Hungary	Malta	Saudi Arabia	Vanuatu
Croatia	Iceland	Mauritius	Singapore	Venezuela, Rep. Bol.
Cyprus	India	Mongolia	Slovak Republic	Vietnam
Czech Republic	Indonesia	Morocco	Slovenia	Yemen, Republic of

Annex Table I-2
Major Source Countries of Tourist Arrivals in PICs, 2000–14

Australia	Japan	Philippines
China	Malaysia	United Kingdom
India	New Zealand	United States

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Annex Table I-3
Series and Data Sources

Abbreviation	Series	Source of Data
X_{ijt}	PICs' exports (deflated by US import price index, US$)	IMF
M_{ijt}	PICs' imports (deflated by US export price index, US$)	IMF
P_{it}	PICs' population (persons)	IMF
P_{jt}	Trading partners' population (persons)	IMF
Y_{it}	PICs' real GDP (deflated by US GDP deflator, US$)	IMF
Y_{jt}	Trading partners' real GDP (deflated by US GDP deflator, US$)	IMF
D_{ij}	Distance between capitals of pairwise trading partners (kms)	CEPII – French Research Centre for International Economics
F_{ij}	Trade agreement between trading countries (binary series)	Country authorities
C_{ij}	Exporter and importer share colonial ties (binary series)	ICOW data – Paul Hensel
V_{ijt}	Tourist arrivals in PICs (persons)	Country Authorities
U_{it}	PICs' urban population ratio (%)	WDI
YPC_{jt}	Source countries' real GDP per capita (US$)	IMF
N_{jt}	Source countries' population (persons)	World Bank
L_{ij}	Common language (binary series)	InfoPlease database – Pearson
S_i	PICs' surface area (kmsq)	World Bank

Annex Table I-4
Summary Statistics: Exports from PICs*

	PICs' exports (US$ million)	PICs' population (million people)	Trading partners' population (million people)	PICs' real GDP (US$ billion)	Trading partners' real GDP (US$ billion)	Distance ('000 kms)	Trade agreement between trading countries	Exporter and importer share colonial ties
Mean	32.30	1.95	124.75	2.80	1,334.33	9.96	0.38	0.06
SD	153.02	2.45	290.24	3.09	2,631.85	5.28	0.49	0.24
Max	3,260.00	7.17	1,354.04	15.03	14,937.56	19.39	1.00	1.00
Min	0.10	0.10	0.00	0.21	0.01	0.75	0.00	0.00

* Based on 3,028 observations.

Note: PICs = Pacific island countries; SD = standard deviation.

Source: Authors' calculations.

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Annex Table I-5
Summary Statistics: Imports of PICs*

	PICs' imports (US$ million)	PICs' population (million people)	Trading partners' population (million people)	PICs' real GDP (US$ billion)	Trading partners' real GDP (US$ billion)	Distance ('000 kms)	Trade agreement between trading countries	Exporter and importer share colonial ties
Mean	23.72	1.79	112.61	2.65	1,106.55	10.96	0.34	0.05
SD	110.20	2.37	270.73	3.01	2,321.52	4.97	0.47	0.22
Max	2,856.60	7.17	1,354.04	15.03	14,937.56	19.12	1.00	1.00
Min	0.03	0.10	0.00	0.21	0.01	0.75	0.00	0.00

* Based on 4,104 observations.

Note: PICs = Pacific island countries; SD = standard deviation.

Source: Authors' calculations.

Annex Table I-6
Summary Statistics: Demand for PIC's Tourism*

	Destination country's urban population ratio (%)	Tourist arrivals in PICs (000 persons)	Source country's population (000 persons)	Common language (binary variable)	Distance (000 kms)	Surface (000 kmsq)	Source country's real GDP per capita (US$ 000)
Mean	25.84	1.97	199.93	0.81	6.57	160.88	25.95
St. dev.	14.37	3.83	351.54	0.39	4.23	213.99	11.07
Max	52.63	25.86	1350.70	1.00	16.32	462.84	42.80
Min	12.43	0.01	3.86	0.00	2.43	0.75	1.51

* Based on 273 observations.

Note: PICs = Pacific island countries; SD = standard deviation.

Source: Authors' calculations.

ANNEX II: UNIT ROOT TESTS

Since a few variables under study are time-varying quantitative series, unit root tests are conducted to identify each variable's integration order.

The time-varying quantitative series in the regressions of merchandise exports and imports are unbalanced panel series, hence Fisher-type unit-root tests are employed (Choi, 2001). The same tests are also applied to the balanced panel series used in the regressions of tourist arrivals. Four test statistics, including inverse chi-squared, inverse normal, inverse logit t and modified inverse chi-squared, fail to reject the null hypothesis of unit root for all series in level, but reject the null hypothesis for the first difference of all corresponding series. See Annex Table II-1 and 6-2. We also test balanced panel variables using the Levin-Lin-Chu unit-root test and Im-Pesaran-Shin unit-root test. The findings remain unchanged. This provides strong evidence that time-varying quantitative series covered in our study are integrated of order one, or I(1).

Further, the residuals from FELSDV regressions in Table 1 and Table 2 are respectively found I(0), providing the evidence of cointegrating relationships in both models.

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Annex Table II-1
Fisher-type unit-root tests for unbalanced panel time-varying quantitative series

Unbalanced panel series	$\ln X_{ijt}$	$\Delta\ln X_{ijt}$	$\ln M_{ijt}$	$\Delta\ln M_{ijt}$	$\ln Y_{it}$	$\Delta\ln Y_{it}$	$\ln Y_{jt}$	$\Delta\ln Y_{jt}$
Balanced panel	No	No	No	No	No	No	No	No
Number of panels	333	238	367	301	694	694	694	694
Avg. number of years	9.74	10.94	12.17	12.49	19.88	18.88	20.09	19.09
Panel means	Included	Included	Included	Included	Included	Included	Included	Included
Time trend	Included	Excluded	Included	Excluded	Included	Excluded	Included	Excluded
Drift term	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
No. of lags	2	2	2	2	2	2	2	2
Inverse chi-squared stat (p-value)	291.5 (0.74)	972.1 (0.00)	430.3 (0.67)	1148.6 (0.00)	1451.1 (0.12)	1485.1 (0.03)	1395.7 (0.43)	3128.7 (0.00)
Inverse normal stat (p-value)	1.24 (0.89)	-16.1 (0.00)	2.52 (0.99)	-17.1 (0.00)	2.24 (0.98)	-6.47 (0.00)	2.88 (0.99)	-21.64 (0.00)
Inverse logit t stat (p-value)	0.41 (0.65)	-21.7 (0.00)	1.87 (0.96)	-20.9 (0.00)	2.85 (0.99)	-6.07 (0.00)	1.95 (0.97)	-25.24 (0.00)
Modified inv. chi-squared stat (p-value)	-0.66 (0.74)	26.7 (0.00)	-0.45 (0.67)	25.5 (0.00)	1.19 (0.12)	1.84 (0.00)	0.14 (0.44)	33.03 (0.00)

Note: Inverse chi-squared statistic requires number of panels to be finite, and the other three statistics are suitable for finite or infinite number of panels. The number of panels in the above unit root tests meet these requirements.

Annex Table II-2
Fisher-type unit-root tests for panel balanced time-varying quantitative series

Balanced panel series	$\ln V_{ijt}$	$\Delta\ln V_{ijt}$	$\ln N_{jt}$	$\Delta\ln N_{jt}$	$\ln YPC_{jt}$	$\Delta\ln YPC_{jt}$	U_{it}	$\Delta \boldsymbol{U_{it}}$
Balanced panel	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of panels	23	23	23	23	22	22	23	23
Avg. number of years	13	12	13	12	13	12	13	12
Panel means	Included	Included	Included	Included	Included	Included	Included	Included
Time trend	Excluded	Excluded	Included	Excluded	Included	Excluded	Excluded	Excluded
Drift term	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Included	Excluded
No. of lags	2	2	2	2	2	2	2	2
Inverse chi-squared stat (p-value)	37.1 (0.82)	85.4 (0.00)	55.2 (0.16)	87.1 (0.00)	23.6 (0.99)	57.0 (0.09)	42.1 (0.55)	645.4 (0.00)
Inverse normal stat (p-value)	2.43 (0.99)	-4.16 (0.00)	0.12 (0.54)	-2.55 (0.01)	1.34 (0.91)	-2.67 (0.00)	2.60 (0.99)	-11.8 (0.00)
Inverse logit t stat (p-value)	2.45 (0.99)	-4.13 (0.00)	-0.01 (0.49)	-2.95 (0.00)	1.20 (0.88)	-2.43 (0.01)	2.76 (0.99)	-33.6 (0.00)
Modified inv. chi-squared stat (p-value)	-0.91 (0.82)	4.11 (0.00)	0.96 (0.16)	4.29 (0.00)	-2.16 (0.98)	1.38 (0.08)	-0.19 (0.57)	62.4 (0.00)

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