

Factors influencing trade between Fiji and its Asian partners

Azmat Gani

This study provides an assessment of Fiji's 'Look North Trade Policy' in the post 2000 period and examines the factors that influence its long-term trade with Asia. The gravity model results suggest that imports by Asian countries are influenced by the size of their population, their infrastructure, and the distance from Fiji. The results also indicate that Fiji's exports to Asia are significantly influenced by Fiji's infrastructure, the distance to markets, and the real exchange rate.

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Prior to its independence in 1970, Fiji's economy was performing well, with an average GDP growth rate of just over 7 per cent during the 1965–70 period (Garnaut 1972). While positive growth rates were achieved in the years following independence, trade policies were inward-oriented and hindered Fiji from becoming a faster growing economy (Gani 2007). A major change in trade policy came into effect following the political crises of 1987, when the then Interim Government instituted major market reforms designed to direct the economy onto a path of sustainable economic growth. As part of its broader economic reform program, Fiji embarked on policy liberalisation in a range of areas

including trade (Elek, Hill and Tabor 1993) with the aim of shaping an outward-looking economy. While reforms were implemented, Fiji at the same time went through a structural transformation, with the decline of the agricultural sector (as a result of falling prices of sugar and unresolved land lease issues, Prasad 2006), the expansion of the manufacturing and services sectors arising from industrial policy reforms that led to the establishment of several garment factories, and the services sector value added improving as a result of tourism growth.

Fiji's reforms gave a boost to its trade performance, with some improvements in exports (Figure 1). Such an achievement is consistent with the Heckscher-Ohlin theory:



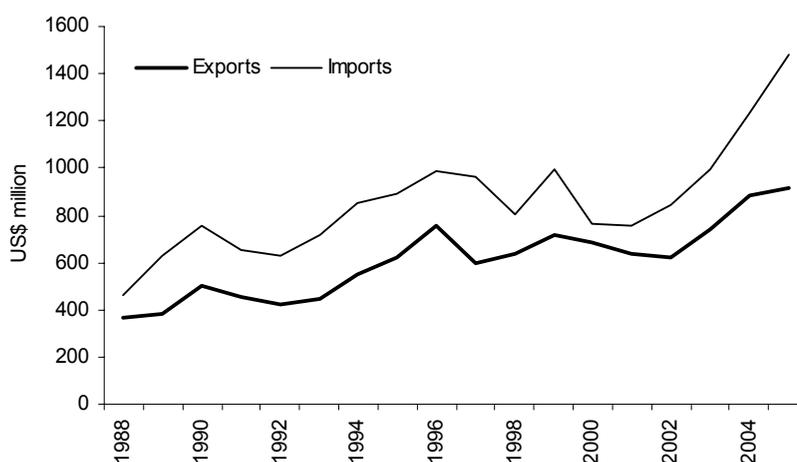
a changing economic structure and, therefore, changing factor endowments should result in shifts in the structure of trade. Fiji's aim to enhance its international trade as a practical means of economic diversification in an era of rising forces of globalisation was further facilitated by major trade agreements in the past two decades. Fiji benefited significantly from the provisions of SPARTECA and the Lomé trade agreements (Narsey 2004). It also became a member of the World Trade Organization (WTO) in January 1996. As a member of WTO, Fiji has an ongoing obligation to continue liberalising its trading environment and shaping an outwardly oriented economy.

Following the political events of 2000, a major initiative in the area of trade policy was the adoption of the Look North Trade Policy (LNTP). The then-Interim Government of Prime Minister Laisenia Qarase formalised the LNTP in search of new trading partners

in Asia. As part of its foreign policy, Fiji had a trading relationship with a number of Asian countries prior to the formulation of the LNTP. However, the core element of Fiji's foreign policy under Prime Minister Laisenia Qarase (2000–06) was to 'look north with the aim of strengthening its relations with Asia in general and China in particular' (Fiji Ministry of Foreign Affairs and External Trade 2008). As part of this policy, its trade focus was to look for new markets in Asian countries (Radio New Zealand International, May 2006). On 5 December 2006 the Qarase-led government was removed from office by the Fiji military (see Chand 2007 and Duncan 2007). However, the post 2006 Interim Government led by Commodore Frank Bainimarama has continued Qarase's LNTP (Wikipedia 2008).

In the seven years since the inception of the LNTP no significant developments can be seen in terms of increasing export markets.

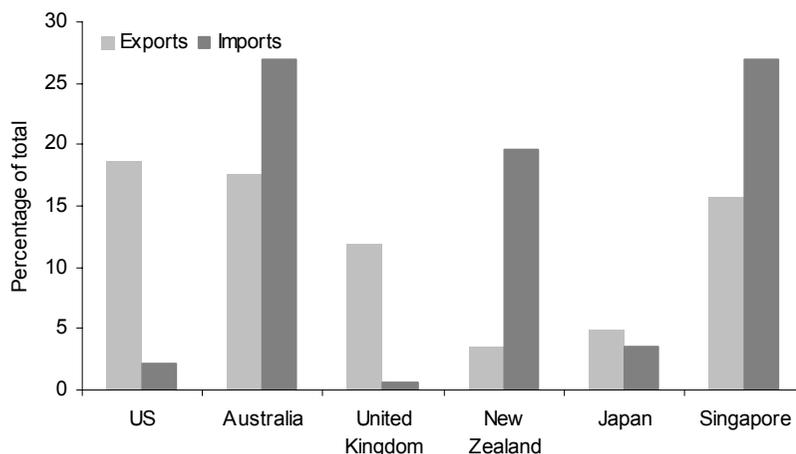
Figure 1 **Fiji's exports and imports, 1988–2005 (US\$ million)**



Source: Asian Development Bank, 2007. *Key Indicators 2007*, Asian Development Bank, Manila.



Figure 2 Fiji's trade with high-income countries, 2005 (per cent)



Source: Asian Development Bank, 2007. *Key Indicators 2007*, Asian Development Bank, Manila.

Despite the existence of the LNTP, the Qarase-led administration also introduced trade distortions by increasing tariffs on a range of agricultural products consumed by the tourism industry, thus making Fiji less competitive internationally (Duncan 2007). Fiji has nevertheless increased its share of imports from Asia.

It is noteworthy that the high-income countries (the United States, Australia, United Kingdom, New Zealand, Japan and Singapore) account for more than three-quarters of Fiji's total trade (Figure 2). However, Fiji has gradually developed trading links with Asian countries: China, Hong Kong, Thailand, India, Indonesia, Republic of Korea, and Malaysia. These countries are becoming more important sources of Fiji's imports but the high-income countries mentioned above have continued to dominate as Fiji's main trading partners. Fiji's trade share with Asian countries is still many times lower than the combined share of the high-income countries.

Increasing Fiji's trading relationship with Asian countries is important for its long-term growth and development, as the influence of major Asian countries such as China, Singapore, Japan and India in the global trading environment is likely to shape Fiji's trade in years to come. In recent times, Fiji also set out to negotiate bilateral economic partnership agreements with India, Malaysia and Indonesia (Radio New Zealand International, 29 May 2006).

In view of the LNTP and the likelihood of further strengthening of Fiji's trade with Asia, this study attempts to identify the factors influencing the level of trade between Fiji and Asian countries. This is the first empirical study examining Fiji's trade with Asia and it is hoped that this study will help fill the wide gap in the Fiji-Asia trade literature. The study adopts a gravity model approach in which time-series, cross-country data for the period 1985 to 2002 are used to determine the influences on Fiji's trade with Asia.



Patterns of Fiji's trade with Asia

This section examines Fiji's trade with Asian countries using published trade statistics. The lack of disaggregated trade statistics has prevented a more in-depth analysis. In particular, imports and exports data (by product category) from Fiji to Asian countries on the basis of the Standard Industrial Trade Classification (SITC) could not be obtained. While the absence of SITC data makes it difficult to ascertain the products traded between Fiji and Asian countries, the SITC data from Fiji gives a general idea of Fiji's imports and exports at a disaggregated level (Figure 3).

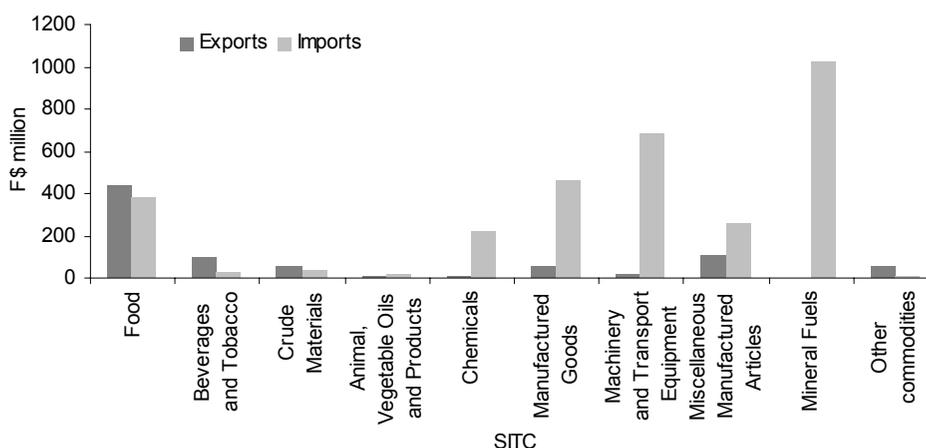
Tables 1 and 2 present statistics on Fiji's exports and imports on a regional basis for the period 2000 to 2006. It can be seen that the Asia Pacific region is the major trading area for Fiji, followed by North America and Europe. In 2006, the Asia Pacific region accounted for just over 90 per cent of Fiji's total imports; and in 2005 it accounted for

about 54 per cent of Fiji's exports. Fiji's exports to other Pacific island countries (Oceania in Tables 1 and 2) have increased since 2000 and data in Table 2 also confirms Fiji's role as an important supplier to countries in Oceania. The trends depicted by the data in Tables 1 and 2 suggest that the Asia Pacific region will remain the major trading region for Fiji for years to come.

While Fiji's imports and exports in the Asia Pacific region are largely dominated by the high-income countries, several countries in the region other than the high-income countries are significant. For example, Figure 4 shows the range of countries in Asia that Fiji traded with in 2006. While Singapore is the major Asian exporter, China, India and Thailand are becoming increasingly important as exporters to Fiji. A feature of Fiji's trade with Asia is that it has a balance of trade deficit with all trading partners: a pattern that has existed for several years.

Fiji's trade relationship with Asian countries can be better assessed by looking

Figure 3 Fiji's merchandise trade, 2006 (F\$ million)



Source: Asian Development Bank, 2007. *Key Indicators 2007*, Asian Development Bank, Manila.



Table 1 Fiji's imports by region, 2000–2006 (c.i.f., percentage of total)

Region	2000	2001	2002	2003	2004	2005	2006
Asia Pacific	49.2	85.6	87.8	84.2	87.8	90.2	90.9
Europe	3.1	5.0	3.4	2.4	4.5	3.4	3.6
North America	4.2	5.1	4.7	9.7	4.0	4.0	2.9
Oceania	0.3	0.6	2.1	0.4	0.6	0.4	0.5
Others	43.2	3.7	2.0	3.3	3.1	2.0	2.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

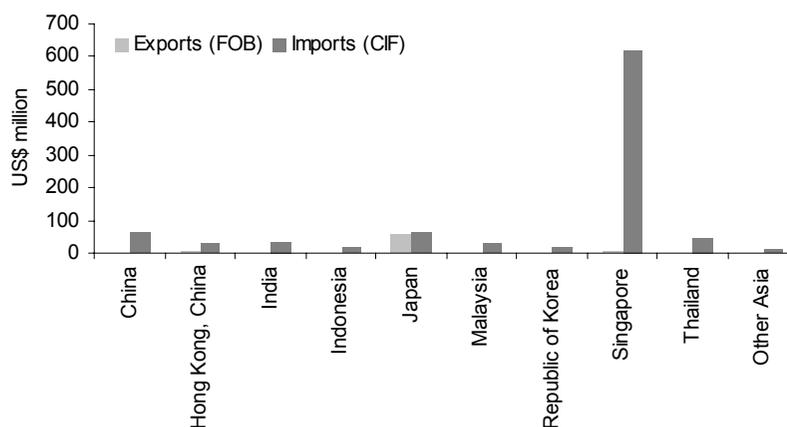
Note: Australia and New Zealand are treated as part of Asia Pacific and not as part of Oceania.
Source: United Nations, 2007. *International Trade Statistics Yearbook 2006*, United Nations, New York.

Table 2 Fiji's exports by region, 2000–2005 (f.o.b, percentage of total)

Region	2000	2001	2002	2003	2004	2005
Asia Pacific	45.3	38.2	52.0	38.0	43.0	54.0
Europe	18.0	23.7	15.8	22.3	16.8	15.9
North America	22.4	26.3	19.3	24.8	27.6	15.5
Oceania	6.9	10.3	10.8	11.3	11.4	12.3
Others	7.4	1.5	2.1	3.6	1.2	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: Australia and New Zealand are treated as part of Asia Pacific and not as part of Oceania.
Source: United Nations, 2007. *International Trade Statistics Yearbook 2006*, United Nations, New York.

Figure 4 Fiji's annual exports and imports with Asia, 2006 (US\$ million)



Source: Asian Development Bank, 2007. *Key Indicators 2007*, Asian Development Bank, Manila.



at its trade over a longer period of time (Figures 5 and 6). Figure 5, which depicts Fiji's imports from Asia for the 1985–2006 period, reveals some interesting patterns. Japan was a major import market for Fiji until 1997; but imports from Japan declined during 1998–2002, reaching their lowest point in 2002. However, Fiji's imports from Singapore (which are primarily petroleum products) have been gradually increasing since 1985 and in 1998 Fiji's imports from Singapore surpassed those from Japan. Since then Singapore has remained the major Asian exporter to Fiji. Fiji's LNTP seems to have had an impact with rising imports from China, Hong Kong and India. In 2006, Singapore was the main Asian exporter to Fiji, with China in second place, followed by Japan in third.

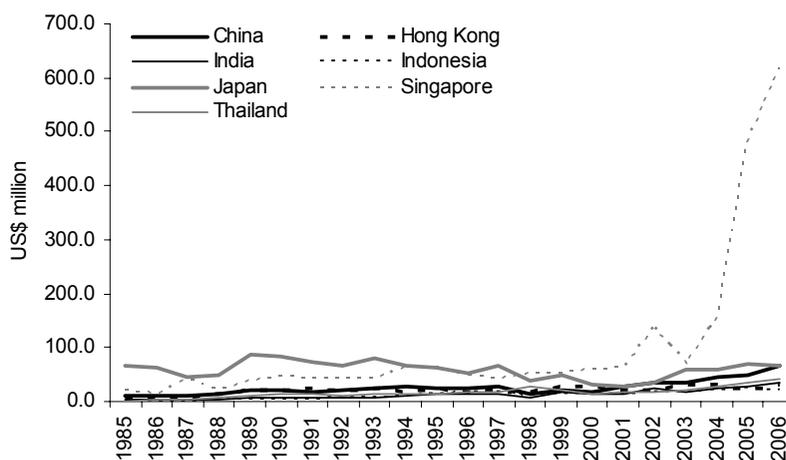
Over the 1985–2006 period, Japan remained Fiji's major Asian export market with exports increasing significantly in the post 2001 period (Figure 6). Fiji's exports

to Singapore improved slightly from 2003 to 2006 while exports to China and Hong Kong declined. A noticeable development on the export side is the significant decline in exports to Malaysia between 1995 and 2000; exports to Malaysia post 2002 could not be assessed due to the absence of data. Malaysia was Fiji's major export market during 1985–90, surpassing Japan; but exports to Malaysia declined significantly after 1992.

The analytical framework

International trade has played an important role in shaping growth and development in many countries. Available statistics for the past century indicate that world gross domestic product grew most rapidly when international trade expanded most rapidly (Maddison 1995). The literature provides statistical evidence that there is a strong positive relationship between international

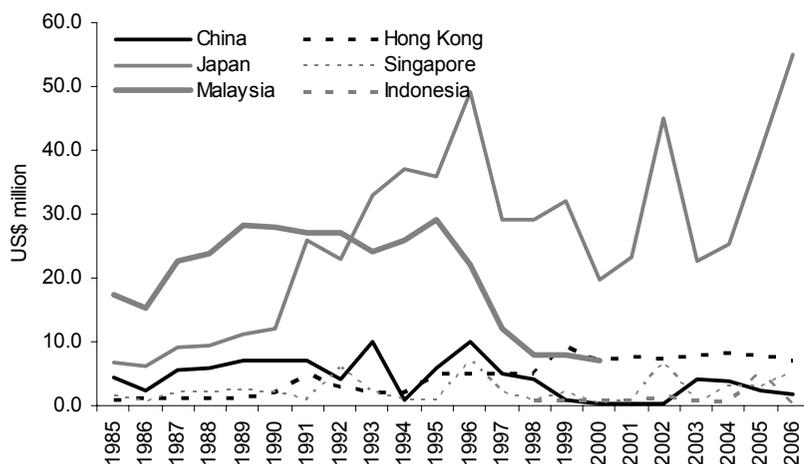
Figure 5 Fiji's imports from Asia, 1985–2006 (c.i.f., US\$ million)



Source: Asian Development Bank, 2007. *Key Indicators 2007*, Asian Development Bank, Manila.



Figure 6 Fiji exports, 1985–2006 (f.o.b., US\$ million)



Source: Asian Development Bank, 2007. *Key Indicators 2007*, Asian Development Bank, Manila.

trade and economic growth. In particular, empirical studies on the sources of economic growth in various countries and regions overwhelmingly suggest that there is a positive relationship between international trade and economic growth (reviewed in Edwards 1998 and Yanikkaya 2003). It has also been established that there is a bi-directional relationship between growth and international trade: trade causes growth and growth causes trade to increase (van den Berg 2001:324).

Theoretical developments pertaining to trade in the last two centuries provide economists with the tools to analyse the welfare effects of international trade. David Ricardo developed the theory of comparative advantage following Adam Smith's theory of absolute advantage. Ricardo's model was later modified by Eli Heckscher and Bertil Ohlin—now known as the Heckscher-Ohlin theorem, which asserts that factor endowments are the major determinants of comparative advantage

and thus determine what trade takes place among nations. These major theoretical developments in international trade provide logical arguments that international trade is welfare enhancing.

While studies in the international trade literature use the above theoretical developments as the basic framework for trade analysis, another model that has been widely used, particularly in the analysis of trade flows from one country and or one region to another, is the gravity model. The gravity model of trade attempts to explain bilateral trade flows between geographical locations. The theoretical underpinning of the gravity model is that, like the gravity concept established in the science of physics, trade flows between two countries are largely driven by forces that speed up or delay such flows. The origin of the gravity model is Isaac Newton's 'theory of universal gravitation'. In 1687 Newton proposed the theory of universal gravitation: a physical law describing the gravitational attraction



between bodies with mass. In modern language, Newton's theory held that the attractive force between two objects i and j is given by

$$F = G \frac{M_i M_j}{D_{ij}^2} \quad (1)$$

where F is the magnitude of the gravitational force between the two point masses, G is the gravitational constant depending on the units of measurement for mass and force, M_i is the mass of the first point mass i , M_j is the mass of the second point mass j , and D is the distance between the two point masses, i and j .

The use of Newton's theory was introduced into economics in 1954. Isard (1954) and later Tinbergen (1962) used the same functional form to analyse international trade flows

$$F_{ij} = G \frac{M_i^\alpha M_j^\beta}{D_{ij}^\theta} \quad (2)$$

where F_{ij} is the trade flow from origin i to destination j , M_i and M_j are the relevant economic sizes of the two locations¹ and D_{ij} is the distance between the locations (usually measured from port to port).

Equation 2 can be thought of as a representation of market forces (supply and demand). According to Head (2003), if country i is the origin, then M_i represents the total amount it is willing to supply to all customers. On the other hand, M_j represents the total amount destination j demands. Head (2003) also notes that distance acts as a tax 'wedge' that imposes trade costs and perhaps lowers trade flows.

In their analysis of trade flows between the European Union and Asia, Hellvin and Nilsson (2000) argue that three key determinants shape bilateral trade flows:

demand-side factors, indicating potential demand in importing countries; supply-side factors indicating potential supply in exporting countries; and other factors that may aid or hinder trade flows.

While theoretical support for the gravity model of trade was lacking, since the mid 1970s a number of theoretical papers have appeared in support of the gravity model. Martinez-Zarzoso (2003) provides an excellent review of some of these developments. Anderson (1979) made the first attempt to derive the gravity equation from a model that assumed product differentiation. Following Anderson (1979), Bergstrand (1985) explored the theoretical determination of bilateral trade in which gravity equations were associated with monopolistic competition models. Much stronger support of the gravity model came from Helpman (1987) who used a differentiated product framework with increasing returns to scale to justify the gravity model. Deardoff (1995) showed that the gravity equation characterises many models and can be justified from standard trade theories. Chen and Wall (1999) and Egger (2000) improved the econometric specification of the gravity equation. More recently, Anderson and Wincoop (2001) derived an operational gravity model that helps solve the so-called 'border puzzle'.²

There are numerous successful applications of this model dating back almost four decades. A discussion of earlier contributions can be found in Frankel (1997), Helliwell (1998), and Hoffmaister (1999). Studies following that of Helliwell (1998) and Hoffmaister (1999) continue to emphasise the importance of the gravity model in analysing bilateral trade flows. For example, the study by Deardorff (1998), Anderson and van Wincoop (2003), and Gibson (2007) emphasise the importance of distance and trade barriers. Other empirical studies show that the gravity model can



explain bilateral trade with reasonable strength in both low and high-income countries (for example, Brun et al. 2005; Subramanian and Tamirisa 2003; Anaman and Al-Kharusi 2003; and Limao and Venables 2001).

The gravity model is considered appropriate for the analysis in this study. It is postulated that the gravity model relates bilateral trade to the economic mass of the two countries (Fiji and Asia), the distance between them, and other possible influences such as the exchange rate and infrastructure. The general form of the Fiji-Asia gravity model is as follows

$$T_{fa,t} = f(GDP_{f,t}, GDP_{a,t})^\phi, (POP_{f,t}, POP_{a,t})^\xi, DIS_{fa,t}^\psi, \varepsilon_{fa,t} \quad (3)$$

where, T is the bilateral trade between Fiji (f) and Asia (a); GDP_f is the nominal gross domestic product in Fiji; GDP_a nominal gross domestic product in Asia; POP_f population in Fiji; POP_a population in Asia country; DIS_{fa} is the geographic distance between Fiji and the major port of entry of an Asian country; ε is the error term with the usual properties; and t is the time period. The *a priori* expectations are ($\phi > 0$); ($\xi < 0$); and ($\psi < 0$).

Some studies have included other potential determinants of trade: for example, bilateral real exchange rates, RER , (Brun et al. 2005) and infrastructure, INS , (Limao and Venables 2001). Bougheas et al. (1999) in estimating an augmented gravity model for a sample of nine European countries include infrastructure variables, measured by kilometres of motorway, and public capital stock and find that these have positive partial correlation with bilateral exports. This study also takes into account the influences of bilateral real exchange rates and infrastructure.

Thus, taking logs (\ln), trade between Fiji and Asia is estimated on the basis of bilateral import (M_{fa}) and bilateral export (X_{fa}) equations specified as follows

$$M_{fa,t} = \eta_0 + \eta_1 \ln gdp_{f,t} + \eta_2 \ln gdp_{a,t} + \eta_3 \ln pop_{f,t} + \eta_4 \ln pop_{a,t} + \eta_5 \ln dis_{fa,t} + \eta_6 \ln rer_{fa,t} + \lambda_7 \ln ins_{fa,t} + \varepsilon_{fa,t} \quad (4)$$

$$X_{fa,t} = \lambda_0 + \lambda_1 \ln gdp_{f,t} + \lambda_2 \ln gdp_{a,t} + \lambda_3 \ln pop_{f,t} + \lambda_4 \ln pop_{a,t} + \lambda_5 \ln dis_{fa,t} + \lambda_6 \ln rer_{fa,t} + \lambda_7 \ln ins_{fa,t} + \varepsilon_{fa,t} \quad (5)$$

Data

The sample countries and years were chosen on the basis of available published data. While Fiji trades with many countries in Asia, only seven countries were chosen for the import model and five for the export model. These countries are major export and import partners of Fiji and published data is available for variables of interest. The countries selected for the import model (Equation 4) are China, Hong Kong, India, Indonesia, Japan, Singapore and Thailand. The countries selected for the export model (Equation 5) are China, Hong Kong, Japan, Singapore and Malaysia. Published data were available for the sample countries for the years 1985 to 2002. While data on some variables were available for years prior to 1985 and post 2002, not all of the sample countries had longer periods of published data. Thus the cut-off sample years were 1985 to 2002. The variable measures and sources of data are summarised in Table 3.



Estimation procedure, results and discussion

This study adopts the panel data estimation procedure, combining cross-country and time-series data involving seven countries and 18 time periods, constituting 126 observations for the import model and five countries and 18 time periods totaling 80 observations for the export model. Estimating models involving cross-sectional, time-series data account for both fixed and random effects. Ordinary least squares estimation of such data would lead to biased estimates, as this method

of estimation assumes a single set of slope coefficients and one intercept. Fixed effects models are usually based on the assumption that the slopes are common but that each cross-sectional unit has its own intercept. The random effects model assumes that the intercepts are drawn from a common distribution with a mean and constant variance. The overall estimation procedure follows the generalised least squares (GLS) method. The bilateral import and export equations are estimated using the panel data estimation technique, thus accounting for the fixed and random effects. The Hausman (1978) test was used to determine if there

Table 3 Variable measures and data sources

Variable	Measure	Source
X	Fiji's total exports to an Asian country in US dollars	Asian Development Bank (2007)
M	Fiji's total imports from an Asian country in US dollars	Asian Development Bank (2007)
GDP_f	Gross domestic product per capita for Fiji (PPP, constant 1995 US dollars)	World Bank (2006)
GDP_a	Gross domestic product per capita for an Asian country (PPP, constant 1995 US dollars)	World Bank (2006)
POP_f	Population of Fiji	World Bank (2006)
POP_a	Population of an Asian country	World Bank (2006)
DIS	Distance between Fiji's main port of entry, Suva, and the main port of entry in an Asian country. The Asian ports of entry for the export model are Singapore, Hong Kong, Tokyo, Shanghai and Kuala Lumpur. For the import model, the Asian ports of exit are Shanghai, Hong Kong, Mumbai, Jakarta, Tokyo, Singapore and Bangkok.	Information available online at http://www.geobytes.com/CityDistanceTool.htm (accessed 10 February 2008).
INS	Infrastructure, measured by telephone mainlines per 1,000 people	World Bank (2006)
RER	Real exchange rate index	World Bank (2006) Asian Development Bank (2007)
TRN	Time trend, taking a value of 1 for 1985 and increasing to 18 for 2002	



were significant differences between the fixed and the random effect models. The Hausman test results confirmed that the two model estimators are not statistically different. The random effects model for both export and import equations are used for discussion in this section.

Tables 4 and 5 contain the summary of the log-linear gravity results of the

GLS estimation for imports and exports, respectively. For the import and export models, several specifications (columns 1 to 5 in Tables 4 and 5) are tested by holding Fiji's population, per capita GDP, infrastructure development, and distance common and successively adding the population, per capita GDP, and infrastructure for the Asian trading partners. A number of variables

Table 4 **Regression results: bilateral import model**

Variable	1	2	3	4	5
Log(POP_i)	-1.286 (0.112)	-3.353 (0.414)	-7.759 (1.590)	-7.994 (1.488)	-16.472 (2.498)*
Log(GDP_i)	0.993 (0.432)	0.939 (0.498)	0.810 (0.686)	0.865 (0.654)	0.213 (0.142)
Log(INS_i)	-0.009 (0.004)	0.163 (0.009)	0.473 (0.464)	0.373 (0.327)	1.117 (0.887)
Log(DIS)	...	-2.409 (6.606)*	-0.981 (3.064)*	-0.380 (1.104)	-0.685 (2.107)**
Log(TRN)	0.544 (1.577)	0.601 (2.269)**	0.618 (3.772)*	0.592 (3.369)*	0.735 (4.640)*
Log(GDP_a)	...	...	0.550 (10.910)*	0.775 (8.108)*	-0.299 (1.401)
Log(POP_a)	...	...	...	0.125 (3.077)*	0.111 (3.128)*
Log(INS_a)	...	...	...	...	0.654 (5.612)*
Log(RER)	-1.129 (3.817)*	-0.700 (2.419)*	0.059 (0.283)	0.137 (0.623)	-0.023 (0.122)
Constant	16.169 (0.104)	63.591 (0.577)	101.70 (1.534)	94.842 (1.297)	221.92 (2.470)*
N	126	126	126	126	126
Adj. R ²	0.25	0.45	0.76	0.75	0.78
DW	1.76	1.95	2.09	2.02	1.94
JB	0.97	6.53	2.87	2.45	0.17

*, **, and *** indicate statistical significance at the 1, 5, and 10 per cent levels, respectively.

Note: t-statistics are in parentheses.

Source: Author's calculations.



produced consistent effects as right-hand-side variables were successively added to the bilateral import and export equations. The adjusted R^2 ranged from 0.25 to 0.78 for the import equation (Table 4) and 0.25 to 0.71 for the export equation (Table 5). For the complete import and export models, the adjusted R^2 values are 0.78 (Table 4) and

0.71 (Table 5), respectively, and these are considered to be highly satisfactory given the nature of the data and the estimation procedure employed.

Turning to the import model, the coefficients of Fiji's per capita GDP, Fiji's infrastructure, Asian population, and Asian infrastructure are positive, indicating

Table 5 Regression results: bilateral export model

Variable	1	2	3	4	5
Log(POP_i)	-48.069 (3.189)*	-50.024 (3.476)*	-49.925 (3.475)*	-43.289 (3.318)*	-52.136 (3.906)*
Log(GDP_i)	-2.021 (0.651)	-0.876 (0.282)	-2.935 (1.032)	-4.321 (2.173)*	-4.889 (2.087)*
Log(INS_i)	5.748 (2.268)*	5.444 (2.112)**	6.748 (2.861)*	8.043 (3.896)*	8.641 (3.993)*
Log(DIS)	...	-2.511 (1.320)	-6.247 (2.780)*	-51.349 (7.872)*	-55.521 (8.840)*
Log(TRN)	0.879 (2.571)*	0.967 (2.507)**	0.833 (2.880)*	1.287 (6.045)*	1.579 (6.218)*
Log(GDP_a)	...	...	-0.556 (4.369)*	-3.602 (8.733)*	-4.687 (10.060)*
Log(POP_a)	...	...	...	-1.433 (7.330)*	-1.392 (7.045)*
Log(INS_a)	...	...	...	...	0.799 (4.042)*
Log(RER)	-0.922 (2.022)**	-0.879 (1.621)***	-1.273 (3.121)*	0.412 (1.122)	1.201 (3.013)*
Constant	647.32 (3.187)*	687.78 (3.536)*	738.85 (3.782)*	1105.1 (5.795)*	1265.4 (6.522)*
N	80	80	80	80	80
Adj. R^2	0.25	0.26	0.42	0.69	0.71
DW	2.21	2.22	2.23	2.12	1.998
JB	3.24	2.31	0.36	4.57	3.164

*, **, and *** indicate statistical significance at the 1, 5, and 10 per cent levels, respectively.

Note: t-statistics are in parentheses.

Source: Author's calculations.



that these factors influenced the flow of imports into Fiji in a positive direction. However, while Fiji's per capita GDP and infrastructure have the correct sign on their coefficients, they are statistically insignificant. The Asian population and Asian infrastructure variables are positive and statistically significant at the one per cent level of significance, providing evidence that these two factors are the dominant influences on Fiji's imports.

For the bilateral export model, the coefficients of Fiji's infrastructure and Asian infrastructure carry the expected positive signs and the coefficients of these two variables are statistically significant at the one per cent level. For both the import and export models, the coefficient of distance carries the expected negative sign and is statistically significant in a number of specifications tested. This outcome of the distance variable is as usually found in gravity models. In both models, the trend variable is positive and statistically significant. The real exchange rate variable has the expected negative sign on the coefficient in a number of specifications in the import model but is statistically insignificant in the complete model (Table 4); while on the export side; it is positive and statistically significant once the complete model is estimated (Table 5). The negative coefficient on the exchange rate in the import model reflects a depreciation of the importing country's currency against that of the exporting country; thus in this case it indicates a reduction of Fiji's imports from Asia.

Conclusion

The main purposes of this paper were to examine the impact of Fiji's LNTP and determine the main factors that influence trade between Fiji and Asia. The analytical procedure adopted is use of the gravity

model to estimate export and import equations using combined time-series/cross-country data for the period 1985 to 2002. A sample of seven Asian countries was chosen for the import model and five for the export model.

The results indicate that imports by Fiji from Asia are significantly influenced by the population and the infrastructure of the Asian countries and the distance between Fiji and the exporting country. The results also suggest that Fiji's exports are significantly influenced by Fiji's infrastructure, the distance to export markets, and the real exchange rate. Consistent with other studies using the gravity model, distance is found to be negative and statistically significantly correlated with Fiji's imports and exports.

The analysis of the NLTP leads to the conclusion that it has not produced the benefits expected. While Fiji has increased imports from Asian markets (presumably mainly petroleum from Singapore and manufactured goods from China and other countries), it has not had much success in opening Asian markets for its exports. In fact, Fiji has seen exports to Malaysia fall—a key market for its exports in the 1980s and early 1990s. Similarly, Fiji's exports to China and Hong Kong in recent times have been declining while Fiji has not made any significant progress in the Indian market, despite India's rapid growth in recent times and the long-term historical and cultural relationship between the two countries.

China, India and several other Asian countries stand apart from most of the rest of the developing world in terms of their increased trade and economic growth, reflected in increases in per capita incomes. Fiji should take advantage of the rising incomes in these Asian countries and aggressively campaign to export to their markets.

The results of this study indicate the importance of telecommunications



infrastructure in Fiji and its trading partners. The positive correlation of telecommunications infrastructure and trade has policy implications with respect to trade facilitation. With the intense pressures of globalisation, there is demand for increased efficiency, faster clearance and delivery of goods, and reduction of other transactions costs among the trading partners. The poor growth of Fiji's exports to Asia suggests that Fiji's slow adoption of improved telecommunications services has hindered its export development. Hopefully, this situation will change with the liberalisation of telecommunication services in Fiji.

In examining the effect of remoteness on the growth of Pacific Island countries, Gibson (2007) found that while remoteness has a regressive effect on growth, Pacific island countries became potentially less remote in recent years as world economic activity shifted towards the Pacific. In light of the findings of this study on the relationship between distance and trade and that of Gibson (2007), Fiji should take advantage of the developments in sea and air transportation industries in Asian countries. In particular, engaging domestic and Asian airlines to link Fiji directly with Asian trading destinations would certainly work to the advantage of Fiji's trade. Partnering in investment in transportation services with the Asian countries, perhaps through the opening of more air routes, would be to Fiji's advantage.

Notes

- ¹ If F is measured as a monetary flow (for example export values), then M is usually the gross domestic product (GDP) or gross national income (GNI) of each location.
- ² One of the most celebrated inferences from the gravity model is McCallum's (1995) finding that the US-Canadian border led to 1988 trade between Canadian provinces that is a factor of 22 times trade between US states and Canadian provinces. This finding suggested that borders must matter very much. The finding was posed as one of the puzzles of the open economy and there has been a growing literature aimed at measuring and understanding trade border effects, now known as the border puzzle. Numerically, the border effect is defined as the actual trade ratio divided by the predicted trade ratio.

References

- Anaman, K.A. and Al-Kharusi, H.S., 2003. 'An analysis of trade flows between Brunei Darussalam and the European Union', *ASEAN Economic Bulletin*, 20(1):60–72.
- Anderson, J.E., 1979. 'A theoretical foundation for gravity equation', *American Economic Review*, 69(1):106–16.
- Anderson, J.E. van Wincoop, E., 2003. 'Gravity with gravitas: a solution to the border puzzle', *American Economic Review*, 93(1):170–92.
- Anderson, J.E. and Wincoop, E., 2001. *Gravity with gravitas: a solution to the border puzzle*, National Bureau of Economic Research Working Paper 8079, National Bureau of Economic Research, Cambridge, Mass.
- Asian Development Bank, 2007. *Key Indicators 2007*, Asian Development Bank, Manila.



- Bergstrand, J.H., 1985. 'The gravity equation in international trade: some microeconomic foundations and empirical evidence', *Review of Economics and Statistics*, 67:474–80.
- Bougheas, S. et al., 1999. 'Infrastructure, transport costs and trade', *Journal of International Economics*, 47:169–89.
- Brun, J-F., Carrere, C., Guillaumont, P. and de Melo, J., 2005. 'Has distance died? Evidence from a panel gravity model', *The World Bank Economic Review*, 19(1):99–120.
- Chand, S., 2007. 'Swim or sink: the predicament of the Fiji economy', *Pacific Economic Bulletin*, 22(1):1–21.
- Chen, I-H and Wall, H.J., 1999. *Controlling for heterogeneity in Gravity Models of trade*, Federal Reserve Bank of St Louis Working Paper 99-010A.
- Deardoff, A., 1995. *Determinants of bilateral trade: does gravity work in a neo-classic world?*, National Bureau of Economic Research Working Paper 5377, Washington, DC.
- , 1998. 'Determinants of bilateral trade: Does gravity work in frictionless model?', in J. Frankel (ed.), *The Regionalisation of the World Economy*, University of Chicago Press, Chicago:7–28.
- Duncan, R., 2007. 'A "clean up campaign" for Fiji's economy', *Pacific Economic Bulletin*, 22(2):119–26.
- Egger, A., 2000. 'A note on the proper econometric specification of the gravity equation', *Economics Letters*, 66:25–31.
- Edwards, S., 1998. 'Openness, productivity and growth: what do we really know?', *Economic Journal*, 108(1):383–98.
- Elek, A., Hill, H., and Tabor, S.R., 1993. 'Liberalisation and diversification in a small economy: Fiji since the 1987 coups', *World Development*, 21(5):749–69.
- Frankel, J., 1997. *Regional trading blocs in the world trading system*, Institute for International Economics, Washington, DC.
- Gani, A., 2007. *The Fiji Macroeconomy: an introduction*, Nova Science Publishers, New York.
- Garnaut, R., 1972. 'Independent Fiji in a world economy', *Economic Record*, 48(121):103–15.
- Gibson, J., 2007. 'Is remoteness a cause of slow growth in the Pacific? A spatial econometric analysis', *Pacific Economic Bulletin*, 22(1):83–101.
- Hausman, J.A., 1978. 'Specification tests in econometrics', *Econometrica*, 46:1,251–71.
- Head, K., 2003. *Gravity for beginners*, Faculty of Commerce, University of British Columbia, Vancouver. Available online at <http://strategy.sauder.ubc.ca/head//gravity.pdf>.
- Helliwell, J.F., 1998. *How Much Do National Borders Matter?*, Brookings Institution Press, Washington, DC.
- Helpman, E., 1987. Imperfect competition and international trade: evidence from fourteen industrial countries, *Journal of Japanese and International Economics*, 1(1):62–81.
- Hellvin, L. and Nilsson, L., 2000. *Trade flows between trading blocs: the case of EU's trade with Asia and NAFTA*, Ministry of Foreign Affairs, Stockholm.
- Hoffmaister, A.W., 1999. *Inflation targeting in Korea: an empirical exploration*, IMF Working Paper WP/99/7, International Monetary Fund, Washington, DC.
- Isard, W., 1954. 'Location theory and trade theory: short run analysis', *Quarterly Journal of Economics*, 68:305–22.
- Limao, N. and Venebles, A.J., 2001. 'Infrastructure, geographical disadvantage and transport costs', *World Bank Economic Review*, 15(3):451–79.



- Maddison, A., 1995. *Monitoring the World Economy 1820–1992*, Organisation for Economic Cooperation and Development, Paris.
- Martinez-Zarzoso, I., 2003. 'Gravity model: an application to trade between regional blocs', *Atlantic Economic Journal*, 31(2):171–87.
- McCallum, J., 1995. 'National borders matter: Canada-US regional trade patterns', *American Economic Review*, 85(3):615–23.
- Narsey, W., 2004. 'PICTA, PACER and EPA's: weaknesses in Pacific island countries' trade policies', *Pacific Economic Bulletin*, 19(3):74–101.
- Prasad, B.C., 2006. 'Resolving the agricultural land lease impasse in Fiji', *Pacific Economic Bulletin*, 21(2):117–93.
- Radio New Zealand International, 2006. Fiji seeks bilateral deals with Asian countries, News Content, Wellington, 29 May.
- Smith, A. 1776/1976. *An inquiry into the nature and causes of the wealth of nations*, University of Chicago Press, Chicago.
- Subramanian, A. and Tamirisa, N.T., 2003. *Is Africa integrated in the global economy?*, IMF Staff Papers, 50(3):352–72.
- The Republic of Fiji Islands Ministry of Foreign Affairs and Trade, 2006. *Foreign Policy*. Available online at <http://www/foreignaffairs.gov.fj> (accessed online 25 February 2008).
- Tinbergen, J., 1962. *Shaping the World Economy: suggestions for an international economic policy*, The Twentieth Century Fund, New York.
- United Nations, 2007. *International Trade Statistics Yearbook 2006*, United Nations, New York.
- van den Berg, H., 2001. *Economic Growth and Development*, McGraw Hill-Irwin, New York.
- Wikipedia, 2008. Fiji recognizes People's Republic of China, Sino-Pacific Relations, Wikipedia, The Free Encyclopedia. Available online at http://en.wikipedia.org/wiki/sino-pacific_relations (accessed 25 February 2008).
- World Bank, 2006. *World Development Indicators CD ROM*, Washington, DC.
- Yanikkaya, H., 2003. 'Trade openness and economic growth: a cross-country empirical investigation', *Journal of Development Economics*, 72:57–89.

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