

Is FDI Led Exports in New Zealand?

P R Bhatt

The objectives of the paper are to study foreign trade and investment dimensions of New Zealand in comparison with its competitors such as Australia, China, India, Japan and Republic of Korea and to study the role of FDI to the growth of exports. Vector autoregression model (VAR) is adopted to estimate the long run causal relationship among exports, foreign direct investment and GDP. The cointegration test result shows that there exist a long run equilibrium relationship among exports, FDI and GDP. It is found from the estimated Error Correction Model that FDI is a significant variable and the result indicates that 1 per cent increase in FDI will lead to 0.62 per cent increase in exports with one year time gap. Granger Causality Test indicates that there is a unilateral relationship between exports and FDI and the direction is from FDI to exports which means that FDI causes exports.

Keywords: FDI, Exports, New Zealand, Error Correction Model, Cointegration, Granger Causality.

JEL Classifications: F14, F21, F23

Section I Introduction

New Zealand is a small country situated in the Southern Pacific Ocean. The country is comprised of two large islands, namely, North Island and South Island and a number of small ones. North Island is inhabited by 75 per cent of the country's population of 4.2 million and the rest in the other part of the country. The population consists of 80 per cent of European and 15 per cent of Maori, the descendants of the original Polynesian inhabitants. The main natural resources of New Zealand are natural gas, iron ore, coal, timber, hydropower, gold and limestone.

New Zealand is a small economy with Gross Domestic Product (GDP) of US \$ 118 billion and per capita GDP of US \$ 27,259 in 2009.¹ Its population is growing at the rate of 1.4 per cent on an average per annum. The country followed an import substitution strategy and restricted trade policies till 1984. It has prohibited imports, competing with domestic production and imposed high tariffs

Dr P R Bhatt is Professor, Universiti Utara Malaysia, Kedah Darul Aman, Malaysia.

1. World Economic Forum, 2010-11. Report of Global Competitiveness.

on permissible imports. It controlled wages, prices, credits, taxes and subsidies and followed a centralized planning allowing both public and private sector in participating economic activities. The country faced economic crisis in 1980s due to oil shocks of 1973 and 1979; losing its preferential access to British markets in 1973 because of its joining the European Economic Community and restrictive economic policies. This has resulted in deterioration of terms of trade, foreign exchange crisis and huge budget deficits. The government has taken drastic measures to improve its economic health by devaluing exchange rate, tightening import licensing requirements and increase in subsidies. It controlled wages, interest rates, and prices to contain inflationary pressures. It invested massively in public sector undertakings to enhance growth of the economy. It had undergone a major economic restructuring towards a more industrialized free market economy that can compete globally since 1984.² The economic reforms included removing all controls on interest rates, borrowing and lending activities and foreign exchange transactions. In 1985, the government floated its currency and abolished all reserve requirements for financial institutions. Other reforms included elimination of agricultural subsidies, rescinding all quantitative import controls and substantial reduction of tariffs. It followed free market forces to drive its economy with focus on international trade and Foreign Direct Investment (FDI). It had created a "business friendly" and entrepreneurial oriented environment to attract private investment in the country. The market-led economy had offered many opportunities for exporters and investors to invest in key areas of development. New Zealand is also a popular tourist destination and tourism constitutes a significant source of income of the country.

The objectives of the paper are (i) to study foreign trade and investment dimensions of New Zealand in comparison with its competitors such as Australia, China, India, Japan and Republic of Korea and (ii) to study the role of FDI to the growth of exports in New Zealand.

The paper is organized as follows. Section II is devoted to survey of literature. Section III compares fundamentals of New Zealand with some of its neighbouring countries. Section IV analyses foreign direct investment of New Zealand *vis-a-vis* its neighbouring countries. Section V discusses exports model, its estimates and analysis and Section VI concludes the discussions.

Section II A Brief Survey of Literature

A causal relationship among macroeconomic variables such as exports, FDI and income are intrinsically related to a country's economic structure. There exists extensive surveys of literature on this subject such as Harrison (1996), Dollar (1992), Krueger (1985) and Thornton (1996). Exports and FDI are fundamentally

2. New Zealand Economy 2010, CIA World Fact book.

substitutes to each other (Dunning, 1977). Bhagavati (1978) points out that volume and efficiency of FDI are more pronounced in export oriented host countries. Helleiner (1973) explained the role of MNCs in manufacturing exports of LDCs. FDI is essentially a driving force behind China's rapid expansion (Xing, 2006). FDI in China facilitated its exports to the FDI source countries (Liu, Wang and Wei, 2001). FDI has substantially enhanced Vietnam's exports to its source countries (Xuan and Xing, 2008). Sun (2001) found that FDI has positive and strongest impact in the coastal region of China. Zhang and Song (2000) found that higher level of FDI led to higher level of provincial exports in China. Barry and Bradley (1997) concluded that there has been a significant direct contribution of foreign producers to increasing Irish exports. Girma, *et al* (2007) found that FDI affects productivity of the acquired firms by the foreign country. Other studies which have shown a significant positive econometric relationship between inward FDI and the host country's exports are Lin (1995), Leichenko and Erickson (1997), Pain and Wakelin (1998), Hejazi and Zafarian (2001), Liu and Shu (2003), Metwally (2004), Zhang (2005). On the other hand Zhang and Felmingham (2001), and Ekanayake, Vogel and Veeramacheneni (2003) found a one-way causality from exports to inward FDI ("exports causes FDI").

Section III

Fundamentals of New Zealand *vis-à-vis* its Neighbouring Countries

New Zealand's average annual GDP growth rate was 3.3 per cent per annum which was moderate compared to the growth rate of India, China and Republic of Korea during 1995-2007 (Table 1). Its annual GDP growth rate of 2.9 per cent in 2007 has come down to -1.4 per cent in 2008 mainly due to slow down of the global economy. India and China consistently had shown stable GDP growth rate during 2005-08. Australia and Republic of Korea had also shown stable growth rate but at lower level except for the year in 2009. New Zealand had achieved a moderate GDP per capita growth rate of 2.1 per cent in 2007 which was much lower than that of China, India and Republic of Korea (Table 2). India and China consistently had shown stable per capita GDP growth rate during period 2000-2007. However, Australia and Republic of Korea had not shown stable growth rate in per capita GDP during the period. New Zealand's exports and imports growth rate were 4.3 per cent each during 1995-2005 which was relatively comparable with its competitors except China and India (Tables 3 and 4). The exports growth of New Zealand was 20.2 per cent in 2007 which has increased from 6.8 per cent in 2005. Its imports growth also increased from 6.8 per cent to 20.2 per cent during the same period (Table 4). Its export share in world export was just 0.22 per cent in 2008 which was the least among its competitors.³ However, the share of exports and imports of New Zealand in its GDP were 28 per cent and 27 per cent respectively in 2009 which were above all of its

3. World Bank, World Development Indicators 2009.

competitors' share except Republic of Korea (Tables 5 and 6). New Zealand's trade was well diversified among Australia, North America, the European Union and East Asia. Its exports were basically commodity-based products and imports were raw materials and capital equipments for industry.⁴ It reduced tariffs systematically and eliminated quantitative controls on imported goods, as a result 95 per cent of imported goods into New Zealand were tariff free.⁵ Balance of goods and services for New Zealand was US \$ 1.3 billion in 2008 which has fallen from US \$ 2.1 billion in 2005 (Table 7). China, Japan and New Zealand consistently have shown positive balance of goods and services whereas Australia and India have shown negative balance of goods and services during 1995-2008 (Table 7).

The structure of value-added in New Zealand has not changed since 1990 with service sector dominated with 69 per cent of value added in GDP, industry sector 24 per cent and agriculture sector 7 per cent in 2008.⁶ The agricultural sector is highly efficient and agricultural exports were an important source of income for the New Zealand economy. There was a negative growth rate in manufacturing sector mainly due to world recession in 2005 and 2006.⁷ The negative manufacturing growth of New Zealand has resulted low over all growth rate of 1.6 per cent in the country in 2006.⁸ Its manufactured goods included plastic goods, carpets and textiles, wine and high-tech computer equipments to countries throughout the world. The low manufacturing growth of New Zealand has also resulted low FDI inflow as FDI is normally attracted to the manufacturing sector (Bhatt 2008a). However, the service sector had shown a strong growth between 2000 and 2007 with annual growth averaging 4 per cent.⁹

Table 1
GDP Growth Rates (Annual per cent)

Country	1990	2000	2005	2006	2007	2008	2009	1995-2007
Australia	-0.1	2.0	2.8	3.1	3.8	3.7	1.3	3.3
China	3.8	8.0	11.3	12.7	14.2	9.6	9.1	9.2
India	5.8	3.9	9.3	9.4	9.6	5.1	7.7	7.7
Japan	5.2	2.9	1.9	2.0	2.4	-1.2	-5.2	1.7
Republic of Korea	9.2	8.5	4.0	5.2	5.1	2.3	0.2	4.6
New Zealand	-0.1	2.7	3.2	0.9	2.9	-1.4	—	3.3

Source: UNCTAD, Handbook of Statistics, 2010.

4. The Treasury, New Zealand Government.

5, 6 & 8. *Ibid.*

7. World Bank, World Development Indicators, 2009.

9. The Treasury, New Zealand Government.

Table 2
GDP per capita Growth (Annual per cent)

Country	1990	2000	2005	2006	2007	2008	2009(e)
Australia	-1.6	0.9	1.8	2.1	2.6	-0.1	0.3
China	2.3	7.2	9.7	10.9	12.3	8.4	8.1
India	2.8	5.4	7.7	8.0	7.5	5.8	4.2
Japan	4.8	2.7	1.9	2.0	2.4	-0.5	-5.1
Republic of Korea	7.9	7.6	3.5	4.7	4.7	1.8	-0.2
New Zealand	-1.5	2.1	1.8	0.8	2.1	-1.1	-2.4

Source: UNCTAD, Handbook of Statistics, 2010.

Table 3
Annual Average Growth Rate of Exports of Goods and Services (per cent)

Country	2005	2006	2007	2008	1995-05
Australia	22.5	16.5	14.4	32.6	5.3
China	28.4	27.2	25.6	17.3	17.5
India	30.0	21.3	20.3	21.6	11.4
Japan	5.2	9.2	7.8	12.3	3.0
Republic of Korea	12.0	14.4	14.1	13.6	7.8
New Zealand	6.8	3.2	20.2	13.4	4.3

Source: UNCTAD, Handbook of Statistics, 2010.

Table 4
Annual Average Growth Rate of Imports of Goods and Services (per cent)

Country	2005	2006	2007	2008	1995-05
Australia	14.5	11.2	18.7	21.1	6.3
China	17.6	19.9	20.7	18.5	18.5
India	43.2	22.7	22.8	36.0	12.8
Japan	13.3	12.6	6.9	23.0	3.7
Republic of Korea	16.4	18.4	15.3	22.0	6.3
New Zealand	6.8	3.2	20.2	13.2	4.3

Source: UNCTAD, Handbook of Statistics, 2010.

Table 5
Exports of Goods and Services as Percentage of GDP

Country	2000	2005	2006	2007	2008	2009
Australia	23	19	20	20	20	20
China	26	37	39	38	35	27
India	14	19	21	21	24	21
Japan	11	14	16	18	18	13
Republic of Korea	41	39	40	42	53	50
New Zealand	36	27	29	28	31	28

Source: World Development Indicators, 2010.

Table 6
Imports of Goods and Services as Percentage of GDP

Country	2000	2005	2006	2007	2008	2009
Australia	23	21	22	22		
China	23	32	31	30	27	22
India	15	22	24	25	29	25
Japan	10	13	15	16	17	12
Republic of Korea	38	37	38	40	54	46
New Zealand	34	30	30	29	32	27

Source: World Development Indicators, 2010.

Table 7
Global Trade (US \$ in billion)

	Exports of Goods and Services	Imports of Goods and Services	Balance of Goods and Services
Australia			
1995	69.4	74.5	-5.1
2000	82.3	86.9	-4.6
2005	138	150.9	-12.9
2008	234.3	242.3	-8
China			
1995	147.3	135.3	12
2000	279.5	250.7	28.2
2005	836.9	712.1	124.8
2008	1333.3	1113.2	220.1

Table 7 (Contd.)

	Exports of Goods and Services	Imports of Goods and Services	Balance of Goods and Services
India			
1995	38	48.3	-10.3
2000	61.5	73.8	-12.3
2005	154.7	182	-27.3
2008	258.8	328	-69.2
Japan			
1995	494	419.5	74.5
2000	528.7	459.7	69
2005	677.6	607.9	69.7
2008	673.6	650.4	23.2
Republic of Korea			
1995	147.4	154.9	-7.5
2000	206.7	192.7	14
2005	234.1	315.1	19
2008	432.1	393.2	38.9
New Zealand			
1995	18.1	17.3	0.8
2000	17.9	17.3	0.6
2005	30.7	32.8	2.1
2008	33.1	31.9	1.3

Source: IMF, *International Financial Statistics*, Various Issues.

Section IV

Foreign Direct Investment Inflows in New Zealand

Foreign Direct Investment (FDI) is not only a source of capital funds and foreign exchange, but also a dynamic and efficient vehicle to secure the much needed industrial technology, managerial expertise and marketing knowledge and networks to improve growth, employment, productivity and export performance. High FDI inflows would contribute to high level of investment and employment generation, raising productivity and skill development and sharply improve competitiveness (Bhatt 2008b). New Zealand is an open economy with low barriers for trade and foreign direct investment. FDI was efficiency-seeking in New Zealand which helped the country to expand its manufacturing base and trade. The main

challenge for New Zealand is to make connections with international production systems by attracting sufficient FDI inflows. FDI inflows for New Zealand were US \$ 5 billion compared to US \$ 95 billion for China, US \$ 22.6 billion for Australia and US \$ 35 billion for India in 2009 (Table 8). New Zealand had attracted fairly significant FDI inflows whose inward FDI stock accumulated as US \$ 66.6 billion till 2009 whereas stock of FDI inflows for China was US \$ 473 billion (Table 9). Australia, the United States, the Netherlands, the United Kingdom and Japan were the largest contributors to FDI in New Zealand. New Zealand's capability to pull international resources in the form of physical capital and know-how has indicated its advantage of production conditions. FDI inflows as a percentage of gross fixed capital formation was 17 per cent for New Zealand against 9.6 per cent for India in 2008 (Table 10). Stock of FDI inflows as a percentage of Gross Domestic Product was the highest at 58 per cent for New Zealand where as it was only 10 per cent for China and 4 per cent for Japan in 2009 (Table 11). This has clearly indicated the capability of New Zealand to attract significant FDI by strengthening its production system. The main vehicle of FDI inflows in New Zealand was through mergers and acquisitions (M&As). It has provided opportunities for foreign multinational companies to undertake direct investment in the country through M & As involving host country firms. The number of companies sold to foreign MNCs in New Zealand was 50 which was valued at US \$ 401 million in 2008 whereas for Australia 306 companies was sold valued at US \$ 34 billion, and for China 236 companies valued at US \$ 5.3 billion.¹⁰ The number of companies purchased abroad by New Zealand based MNCs was 32 which was valued at US \$ 4.1 billion and for Australia it was 153 companies valued at US \$ 18.5 billion in 2008.¹¹

Table 8
FDI Inflows (in billions of US \$)

Year	Australia	China	India	Japan	Republic of Korea	New Zealand
1990	8.5	3.5	0.2	1.8	0.1	1.7
1995	13.4	37.5	2.2	0	1.2	2.9
2000	15.6	40.7	3.6	8.3	9.0	1.3
2005	24.2	72.4	7.6	2.8	7.1	1.5
2009	22.6	95.0	34.6	11.9	4.9	4.7

Source: UNCTAD, World Investment Report, 2009.

10. UNCTAD, World Investment Report.

11. *ibid.*

Table 9
Stock of FDI Inflows (in billions of US \$)

Year	Australia	China	India	Japan	Republic of Korea	New Zealand
1990	73.6	20.7	1.7	9.9	5.2	7.9
1995	104.1	101.1	5.8	33.5	9.5	25.7
2000	118.9	193.3	16.3	50.3	38.1	24.9
2005	242.2	272.1	43.2	100.9	104.9	51.5
2009	328.1	473.1	164.0	200.1	110.8	66.6

Source: UNCTAD, World Investment Report, 2009.

Table 10
FDI Inflows as a Percentage of Gross Fixed Capital Formation

Year	Australia	China	India	Japan	Republic of Korea	New Zealand
1990	10.6	3.5	0.3	0.2	0.8	18.9
1995	15.4	15.0	2.2	0.0	0.7	21.1
2000	16.0	10.0	3.4	0.7	5.6	12.6
2005	11.9	7.7	3.0	0.3	2.9	6.1
2009	8.0	4.0	8.4	1.1	2.4	1.4

Source: UNCTAD, World Investment Report, 2009.

Table 11
FDI Inflows as a Percentage of Gross Domestic Product (in millions of US \$)

Year	Australia	China	India	Japan	Republic of Korea	New Zealand
1990	23.2	5.1	0.5	0.3	2.0	18.1
1995	28.0	13.4	1.5	0.6	1.8	51.6
2000	29.8	16.2	3.5	1.1	7.1	47.3
2005	32.8	12.2	5.1	2.2	12.4	48.2
2009	33.5	10.1	12.9	3.9	13.3	57.7

Source: UNCTAD, World Investment Report, 2009.

Section V

Exports Model of New Zealand

The exports model considered in this study is given by:

$$\text{Exports} = f(\text{FDI}, \text{GDP})$$

Where FDI = Foreign Direct Investment
GDP = Gross Domestic Product

The two other variables such as capital stock and exchange rates have been dropped from the model as they are not significant in the estimated model. Moreover, these two variables are correlated with FDI and GDP creating multicollinearity problem.

The data that are used in this analysis are annual covering the period 1990-2009 and are obtained from International Monetary Fund and UNCTAD.

Vector Autoregression model (VAR) is adopted to estimate the long run causal relationship among exports, foreign direct investment and GDP.

Unit Root Test

Before testing the cointegration of two or more variables, it is required to check whether the variables have unit root. The existence of unit root can be tested by augmented Dickey-Fuller test and/or Phillip-Perron test.

The general form of augmented Dickey-Fuller test is given by:

$$\Delta Y_t = \alpha + \beta t + \lambda Y_{t-1} + \sum_{i=1}^p \gamma_i \Delta Y_{t-i} - I + u_t$$

The null and alternative hypothesis for the existence of unit root in Y_t is:

$$H_0: \lambda = 0 \quad H_1: \lambda < 0$$

The null hypothesis is that there is a unit root.

The Phillip-Perron equation is given by:

$$\Delta Y_t = \alpha + \beta t + \lambda Y_{t-1} + u_t$$

Johansen Cointegration Test (Hjalmarsson and Osterholm, 2007)

Johansen (1991, 1995) developed cointegration test based on vector autoregression model (VAR) of order p which is given by:

$$y_t = \mu + A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + \varepsilon_t$$

Where y_t is an $n \times 1$ vector of non-stationary $I(1)$ variables and ε_t is an $n \times 1$ vector of innovations.

This can be rewritten as:

$$\Delta Y_t = \mu + \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \varepsilon_t$$

$$\text{where } \Pi = \sum_{i=1}^p A_i - I \quad \text{and} \quad \Gamma_i = \sum_{j=i+1}^p A_j$$

Granger's representation theorem asserts that if the coefficient matrix Π has reduced rank $r < n$, then there exist $n \times r$ matrices α and β each with rank r such that $\Pi = \alpha\beta'$ and $\beta' y_t$ is $I(0)$. r is the number of cointegrating relations and each column of β is the cointegrating vector. The elements of α are known as the adjustment parameters in the Vector Error Correction (VEC) model. Johansen's method is to estimate the Π matrix from an unrestricted VAR and to test whether we can reject the restrictions implied by the reduced rank of Π .

Johansen (1988, 1989) and Johansen and Juselius (1990) suggested two test statistic to determine the number of cointegration vectors. The first one is the trace test (λ trace). It tests the null hypothesis that the number of distinct cointegrating vector is less than or equal to q against a general unrestricted alternatives $q = r$. The test is calculated as:

$$\lambda_{\text{trace}(r)} = -T \sum_{j=q+1}^n \ln(1 - \lambda_j)$$

Where T is the number of usable observations and λ_j 's are the estimated eigenvalue from the matrix. The trace test tests the null hypothesis of r cointegrating vectors against the alternative hypothesis of n cointegrating vectors.

The second test statistic is the maximum eigenvalue test (λ_{max}) that is calculated as:

$$\lambda_{\text{max}(r+1)} = -T \ln(1 - \lambda_{r+1})$$

Where T is the number of usable observations and λ_i 's are the estimated eigenvalue from the matrix.

The maximum eigenvalue test tests the null hypothesis of r cointegrating vectors against the alternative $r+1$ cointegrating vector.

The results of unit root test of all the three variables are given in Table 12 which indicates that all variables have unit root at 1 per cent level of significance. Since all the three variables have unit root, it can be tested whether there exist atleast one cointegration equation among the variables by Johansen cointegration test. The test result reveals that there exists atleast one cointegration equation at 0.05 per cent level (Table 13). The existence of the cointegrating equations confirms the long-run equilibrium linear relation among the variables. The cointegrating equation is given by:

$$\begin{array}{l} \log(\text{export}) = 1.148785 \log(\text{GDP}) - 0.400619 \log(\text{FDI}) \\ \text{t-ratio} \quad \quad (15.849669) \quad \quad (-16.365155) \end{array}$$

A Vector Autoregression Model (VAR) with an Error Correction Mechanism

As seen above, since there exist cointegration relation among the variables, a VAR model with an Error Correction can be estimated.

The Vector Error Correction Model takes the following form:

$$\Delta \log(\text{exports})_t = \text{lagged}(\Delta(\log(\text{exports}_t))) + \Delta(\log(\text{GDP}_t)) + \Delta(\log(\text{FDI}_t)) + \beta u_{t-1} + v_t$$

Where Δ is the first difference of the variables, u_{t-1} are the estimated residuals from the cointegrated regression (long-run relationship) and represent the deviation from the equilibrium in time period t . $-1 < \beta < 0$, short-run parameter and v_t white disturbance term.

The estimated Error Correction Model is given in Table 14. The model is highly significant with adjusted $R^2 = 0.982619$. The error correction term is statistically significant and has a negative sign indicating that there exists a long-run equilibrium relationship among exports, GDP and FDI. FDI is a significant variable in the model which indicates that 1 per cent increase in FDI will lead to 0.62 per cent increase in exports with one year time gap.

Granger Causality Test indicates that there is a unilateral relationship between exports and FDI and the direction is from FDI to exports. Hence it is confirmed from the Granger causality test that FDI causes exports. But there is bilateral relationship between exports and GDP and GDP and FDI (Table 15).

Table 12
Unit Root Test for Stationarity

Variable	ADF Test Statistic	PP Test Statistic	Critical Value at 1 per cent Level
log(Export)	-2.968903	-2.903186	-3.459898
$\Delta(\log(\text{Export}))$	-7.266251	-19.63963	-3.459898
log(GDP)	-0.394078	-0.545738	-3.459898
$\Delta(\log(\text{GDP}))$	-2.698509	-2.698509	-3.459898
log(FDI)	-3.51424	-8.255193	-3.459898
$\Delta(\log(\text{FDI}))$	-7.184888	-3.506239	-3.459898

Table 13
Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CEs	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None*	0.972319	72.75866	29.79707	0.0000
At most 1	0.330295	8.192483	15.49471	0.4450
At most 2	0.052776	0.975948	3.841466	0.3232

Notes: Trace test indicates 1 cointegrating equation at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level.

** MacKinnon-Haug-Michalis (1999) p-values.

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CEs	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.
None*	0.972319	64.56618	21.13162	0.0000
At most 1	0.330295	7.216536	14.26460	0.4638
At most 2	0.052776	0.975948	3.841466	0.3232

Notes: Max-Eigenvalue test indicates 1 cointegrating equation at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level.

** MacKinnon-Haug-Michalis (1999) p-values.

Table 14
Vector Error Correction Model

$$\Delta(\log \text{Export})_t = -1.493418 \text{ EC}_{t-1}^* + 0.069259 \Delta(\log \text{Export})_{t-1} + 0.051890 \Delta(\log \text{Export})_{t-2}$$

$$\begin{matrix} (-4.43353) & (0.91204) & (1.09737) \end{matrix}$$

$$+ 0.240201 \Delta(\log \text{GDP})_{t-1} - 0.141739 \Delta(\log \text{GDP})_{t-2}$$

$$\begin{matrix} (0.50608) & (-0.41300) \end{matrix}$$

$$+ 0.622310 \Delta(\log \text{FDI})_{t-1}^* + 0.159722 \Delta(\log \text{FDI})_{t-2} - 0.006011$$

$$\begin{matrix} (4.23444) & (1.09606) & (-0.15996) \end{matrix}$$

$$R^2 = 0.990223 \quad \text{Adj } R^2 = 0.982619$$

Notes: * indicate significant at 1 per cent level.
Δ indicates first difference.

Table 15
Pairwise Granger Causality Tests

Null Hypothesis	Obs	F-Statistic	Prob.
LOG(GDP) does not Granger Cause			
LOG(EXPORT)	18	0.90005	0.4304
LOG(EXPORT) does not Granger Cause LOG(GDP)		0.44548	0.6499
LOG(FDI) does not Granger Cause			
LOG(EXPORT)	20	24.5215	2.0E-05
LOG(EXPORT) does not Granger Cause LOG(FDI)		0.19199	0.8273
LOG(FDI) does not Granger Cause LOG(GDP)	18	3.00274	0.0847
LOG(GDP) does not Granger Cause LOG(FDI)		2.35150	0.1344

Section VI

Summary and Conclusion

New Zealand is a small economy with gross domestic product of US \$ 118 billion and per capita GDP US \$ 27,259 in 2009. Its average annual GDP growth rate was 3.3 per cent per annum which was moderate compared to the growth rate of India, China and Republic of Korea during 1995-2007. New Zealand had achieved a moderate GDP per capita growth rate of 2.1 per cent in 2007 which was much lower than that of China, India and Republic of Korea. New Zealand's exports and imports growth rate were 4.3 per cent each during 1995-2005 which was relatively comparable with its competitors except China and India. Its export share in world export was just 0.22 per cent in 2008 which was the least among its competitors. However, the share of exports and imports of its GDP were 28 per cent and 27 per cent respectively in 2009 which were above all of its competitors share except Republic of Korea. New Zealand's trade was well

diversified among Australia, North America, the European Union and East Asia. Its exports were basically commodity-based products and imports were raw materials and capital equipments for industry. The structure of value-added in New Zealand has not changed since 1990 with service sector dominated with 69 per cent of value-added in GDP, industry sector 24 per cent and agriculture sector 7 per cent in 2008. FDI inflows for New Zealand were US \$ 5 billion compared to US \$ 95 billion for China, US \$ 22.6 billion for Australia and US \$ 35 billion for India in 2009. New Zealand had attracted fairly significant FDI inflows whose inward FDI stock accumulated to US \$ 66.6 billion in 2009 whereas stock of FDI inflows for China was US \$ 473 billion in 2009. FDI inflows as a percentage of Gross Fixed capital formation was 17 per cent for New Zealand against 9.6 per cent for India in 2008. Stock of FDI inflows as a percentage of Gross Domestic Product was the highest at 58 per cent for New Zealand where as it was only 10 per cent for China and 4 per cent for Japan in 2009. A vector autoregression model (VAR) is adopted to estimate the long-run causal relationship among exports, foreign direct investment and GDP. The cointegration test result shows that there exist a long-run equilibrium relationship among FDI, GDP and exports. It is found from the estimated Error Correction Model that FDI is a significant variable and the result indicates that 1 per cent increase in FDI will lead to 0.62 per cent increase in exports with one year time gap. Granger Causality Test indicates that there is a unilateral relationship between exports and FDI and the direction is from FDI to exports which means that FDI causes exports.

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