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CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	**MACHINE USAGE BASED ON PRODUCT MIX IN MANUFACTURING CLASSIFICATIONS** *DR. SURESH TULSHIRAM SALUNKE & SHWETA SURESH TULSHIRAM SALUNKE*	1
2.	**A STUDY ON THE CHALLENGES FACED BY TIRUPUR GARMENT EXPORTERS** *DR. S. SARANANAN & S. MOHANRAJ*	5
3.	**HEALTHCARE AND MEDICAL TOURISM: RETROSPECT AND PROSPECT** *R. VEERAPPAN, J. SASIGANTH, FR. ANGELO JOSEPH & A. JOE ROBINSON*	8
4.	**TRADE BETWEEN INDIA AND ASEAN COUNTRIES FOR AGRICULTURAL AND MINERAL PRODUCTS: EXPLORING COMPATIBILITY THROUGH REVEALED COMPARATIVE ADVANTAGE** *DR. B. P. SARATH CHANDRAN*	11
5.	**RELEVANCE OF ISLAMIC BANKING TO INDIAN ECONOMY** *S. NAYAMATH BASHA & DR. BADIUDDIN AHMED*	17
6.	**AXIOMATIZATION OF THE PREFERENCE CORE IN MULTICRITERIA COOPERATIVE GAMES** *A. SUGUMARAN & P. VISHNU PRAKASH*	21
7.	**CORPORATE GOVERNANCE & INFORMATION SECURITY: AN ANALYTICAL STUDY** *DR. BADIUDDIN AHMED, SYED HAMID MOHIUDDIN QUADRI & IRFANUDDIN*	25
8.	**RUPEE FALLING: DOLLAR IS ON HORSE RIDE** *M. RAMU, M. S. K. VARMA & S.SUDHEER*	28
9.	**AN ANALYSIS OF INDIAN AUTOMOBILE INDUSTRY: SLOWDOWN AS AN OPPORTUNITY FOR NEW DEVELOPMENT** *DR. ANKUR KUMAR RASTOGI & NITIN GOPAL GUPTA*	36
10.	**A PROPOSED THEORY OF NEURAL NETWORKS IN KNOWLEDGE MANAGEMENT FOR AN EXPERT SYSTEM** *V. SUMALATHA*	41
11.	**THE INFORMATION MANAGEMENT PRACTICES OF BHIRDAR UNIVERSITY** *DR. MATEBE TAFERE*	45
12.	**VEBLENIAN SOCIO-PSYCHOLOGICAL MODEL: AN ETHNOGRAPHIC STUDY** *DR. K. ABRAHAM & DR. M. RAJASEKHAR*	51
13.	**INNOVATIVE TEACHING AND LEARNING TO ENHANCE CRITICAL THINKING AND REFLECTIVE PRACTICE, FOR QUALITY AND RELEVANCE OF HEALTH EDUCATION** *DR. BIRHANU MOGES ALEMU*	56
14.	**A STATISTICAL ANALYSIS OF PHYSICALLY DISABLED POPULATION: DEVELOPMENT IN REHABILITATION SCHEMES** *DR. CHINNA ASHAPPA*	68
15.	**USE OF E-JOURNALS IN THE DISCIPLINES OF LIFE SCIENCE IN K.U.K: AN ANALYTICAL STUDY** *ANIL KUMAR*	72
16.	**ISLAMIC MICROFINANCE-FINANCING THE POOREST OF THE POOR** *DILAWAR AHMAD BHAT*	79
17.	**USE OF CLOUD COMPUTING IN MANUFACTURING COMPANIES** *SHEETAL MAHENDHER & SUBASHREE*	83
18.	**CLIMATE CHANGE AND VECTOR BORNE DISEASES: THE ROLE OF GIS & REMOTE SENSING** *DIVYA GEORGE & DR. R. RAJKUMAR*	88
19.	**FEASIBILITY STUDY FOR IMPLEMENTATION OF AN ACTIVITY- BASED COSTING SYSTEM (ABCS) IN ALLOY STEEL INDUSTRIES (ASI)** *MAJID NILI AHMADABADI & ALI SOLEIMANI*	96
20.	**AN IMPACT OF SERVICE QUALITY ON LOYAL CUSTOMER AND ITS SATISFACTION: A STUDY OF PRIVATE BANKS IN KANPUR CITY (INDIA)** *RAVINDRA KUMAR KUSHWAHA, GURPREET SINGH, NEERAJ JOSHI & NEHA PUSHPAK*	101
21.	**A STUDY ON EMPLOYEE PERFORMANCE APPRAISAL IN CEMENT INDUSTRY IN TAMILNADU** *DR. M. RAGURAMAN, R. VEERAPPAN, S. ALBERT, M. SUGANYA & S. HEMAVATHY*	107
22.	**DETERMINANTS OF MOBILE BANKING TECHNOLOGY ADOPTION OF COMMERCIAL BANKS IN ETHIOPIA** *ZEMENU AYNADIS, TESFAYE ABATE & ABEBE TILAHUN*	110
23.	**EVALUATION OF LIC'S EFFICIENCY IN GENERATING CAPITAL FUNDS UNDER ULIP'S SCHEMES** *MANJUSHREE S*	117
24.	**EVALUATION OF COST MANAGEMENT TOOLS: A STUDY ON MULTINATIONAL PHARMACEUTICAL COMPANIES OF BANGLADESH** *TAHMINA AHMED*	120
25.	**AN EVALUATION OF NEW ZEALAND'S EXPORT COMPETITIVENESS USING SHIFT-SHARE ANALYSIS** *DR. SATYA GONUGUNTLA*	126
26.	**INCREASING INTERNATIONAL COLLABORATIONS IN SCIENCE AND TECHNOLOGY AROUND THE WORLD, AND ITS PATTERNS IN INDIA WITH SPECIAL REFERENCE TO INDO-GERMAN COLLABORATION** *MUNEEB HUSSAIN GATTOO & MUJEEB HUSSAIN GATTOO*	131
27.	**A STUDY ON THE ETHICAL INVESTMENT DECISION MAKING IN INDIAN RELIGIOUS ORGANISATIONS** *BINCY BABURAJ KALUVILLA*	135
28.	**GREEN MARKETING MIX: A STRATEGY FOR SUSTAINABLE DEVELOPMENT** *L. NANDA GOPAL*	138
29.	**CONSIDERING RELATIONSHIP BETWEEN CASH WITH CAPITAL COST AND FINANCIAL FLEXIBILITY** *AHMAD GHASEMI & DR. ROYA DARABI*	140
30.	**UNDERSTANDING THE GREEKS AND THEIR USE TO MEASURE RISK** *SANJANA JUNEJA*	146
	REQUEST FOR FEEDBACK	150

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   RESULTS & DISCUSSION

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AN EVALUATION OF NEW ZEALAND'S EXPORT COMPETITIVENESS USING SHIFT-SHARE ANALYSIS

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ABSTRACT

Being a small country, New Zealand's economic performance depends largely on external trade. Accordingly, New Zealand negotiated free trade agreements with several countries the most notable being the Closer Economic Relations agreement with its closest neighbour, Australia. As a result, there has been a significant increase in the merchandise exports coupled with a change both in the export market structure and the commodity composition during the study period i.e. 2005-2011. The aim of the study is to analyse the influence some key variables such as growth in world exports, commodity composition, trading partner distribution and competitiveness on the export growth. Shift-share analysis has been applied to decompose the impact of these factors on exports. Top 10 commodities to top 6 destinations have been included in the study. Data has been sourced from UNCOMTRADE database and Statistics New Zealand. The results show that overall growth in world exports, Globo, has been the major contributing factor followed by a positive effect of New Zealand's own export competitiveness, Perfo. Both commodity composition, Compo, and trading partner distribution, Geo, had a negative impact on New Zealand's exports. In order for the Geo component to become positive New Zealand needs to increase its exports to countries that do not export primary products such as dairy and meat on a large scale.

JEL CLASSIFICATION
F1 Trade

KEYWORDS
Composition (Compo), Geographical (Geo), Global (Globo), Performance (Perfo), Shift-share Analysis.

INTRODUCTION

New Zealand (NZ) is a trade dependent nation and being a small country its economic prosperity depends on its export performance. Historically, New Zealand had a narrow export base both in terms of markets and commodity composition. In 1970, the major export markets were the UK and the USA accounting for 55% of NZ's exports. The commodity composition concentrated on primary products such as Dairy, Meat and Wool which together accounted for 95% of the merchandise exports. NZ was accorded a special status with UK as a result of a trade agreement in 1932, accordingly the latter remained NZ's major export destination. When the UK joined the EEC in 1973 the special status extended to NZ ended (Abbott 2007). This development has compelled NZ to find new markets for its exports. A major development in this direction was the signing of Closer Economic Relations Trade Agreement (CER) with Australia in 1983. Consequently, there has been a significant growth in NZ's merchandise exports to Australia. Encouraged by this, subsequently NZ has negotiated free trade agreements (FTAs) with several other countries to diversify the export markets. These agreements include a Closer Economic Partnership Agreement with Singapore in 2001, Trans-Pacific Strategic Economic Partnership agreement with Singapore, Chile and Brunei (2005), a CEP with Thailand (2005) NZ-China FTA (2008), and ASEAN-AUSTRALIA-NZ FTA in 2010 to strengthen the external sector and enhance the gains of free trade.

FTAs tend to have a positive impact on export growth and market diversification. NZ's merchandise exports recorded a significant growth in the recent years from 17% of GDP in 2003 to 24% in 2011. During the years 2005-2010 the world merchandise exports increased by an average of 8% per annum. As against this, New Zealand's merchandise exports increased by an average of 8.25% per annum during the above period. An important feature of NZ's merchandise exports is that between the years 2000 and 2004 the growth was practically stagnant with a 5% growth in 2004 over 2000. From the year 2005 onwards there has been a considerable growth in merchandise exports registering a 55% growth of in 2011 over 2005. Also, there has been a change in the export market structure, in terms of ranking, during this period. Canada, Germany have lost their place in the top 10 export destinations. Whereas, the position of PRC has increased to 2nd from 4th place. Another key development in the recent past is the growing competition in some of the major export markets for some of the commodities in which NZ has a comparative advantage. For example, Russia and Korea have become strong competitors for timber in China and Japan. Similarly, NZ wine industry faces tough competition from Australia in the UK and USA markets.

This paper investigates the influence of some key export markets as well as changes in competitiveness on the overall growth in merchandise exports during the years 2005 to 2011using shift share analysis. The background and objective of the study is presented in section II. Literature review is presented in section III and section IV explains the methodology. The results of the analysis are presented in section V and section VI concludes.

THE BACKGROUND

A key aspect of the New Zealand's merchandise exports is the changing market structure in the recent years i.e. changing importance of export markets (Table-1). In the year 2005 five of the top 10 destinations were Asian countries accounting for 23% of the merchandise exports. By the year 2011 seven out of the top 10 destinations were from Asia and accounted for 31% of the merchandise exports. This change in the export market structure is a clear indication of the growing importance of Asian markets to the New Zealand economy and the declining share of the European markets. Some highlights of the changes in NZ's export markets are presented below.

Australia has emerged as New Zealand's most important trading partner in the post CER period indicating a significant growth in bilateral trade flows between the two countries. Currently, Australia accounts for 23% NZ's merchandise exports and about same percent of imports, a considerable growth from the 13% recorded in 1983. During the study period Australia retained its position as New Zealand's top export destination. USA, which was in the second position was replaced by China in 2010. Japan has been relegated to 4th place from 3rd which was taken over by USA. Germany which was in the 7th position in 2005, lost its place from the top 10 markets by 2010. Whereas Indonesia and India which were not in the top 10 list in 2005 have found place in the top 10 export destinations by 2011. Indonesia became the 7th largest export destination in 2007 and remained in the top 10 list by 2011. India's position has been moving up from 13th in 2009 to 7th in the year 2011. The changing structure of the New Zealand's top 10 export markets is presented in Table-1.

A second aspect of NZ's merchandise exports is the changes in commodity composition. The composition of top 10 commodities has also changed in 2011 compared to 2005. Some significant changes are, Mechanical machinery equipment which was in 4th place in 2005, has been relegated to 7th place by 2011. Aluminium and Aluminium articles from 7th to 8th, Electrical machinery and equipment from 8th to 10th place. Whereas milk powder, butter, and cheese, meat and edible offal, logs, wood and wood articles retained their respective positions of 1,2, and 3 of the top 10 commodities which were in the top 10 category in 2005. A key development during this period is that by 2011 crude oil occupied 4th place and wine 9th place. Both these commodities were not in the top 10 list in 2005. Two of the top 10 commodities in 2005 *viz*, wool, paper & paperboard lost their place in the list. Crude oil and wine have joined the list in 2011 (Table-1). In 2011, 7 out of 10 top commodities were land based as against 6 out of 10 in 2005 highlighting the dominance of primary products in NZ's merchandise exports.

TABLE-1: TOP 10 EXPORT DESTINATIONS & TOP 10 COMMODITIES-RANKINGS

Year	2005	2011	Year	2005	2011
Country			Commodity		
Australia	(1)	(1)	Milk powder, Butter and Cheese HS Code 0401-0406	(1)	(1)
USA	(2)	(3)	Meat and Edible Offal HS Code 02	(2)	(2)
Japan	(3)	(4)	Logs, Wood and Wood articles HS Code 44	(3)	(3)
U K	(5)	(6)	Crude oil HS Code 2709		(4)
Korea	(6)	(5)	Mechanical Machinery and Equipment HS Code 84	(4)	(7)
PRC	(4)	(2)	Fruit &Nuts HS Code 0803-0814	(5)	(5)
Germany	(7)	(13)	Fish HS Code 03	(6)	(6)
Hong Kong (SAR)	(10)	(12)	Aluminium and Aluminium articles HS Code 76	(7)	(8)
Taiwan	(8)	(8)	Wine HS Code 22		(9)
Malaysia	468 (11)	875 (9)	Electrical Machinery and Equipment HS Code85	(8)	(10)
Canada	(9)	(18)	Wool HS Code 51	(9)	
Indonesia		(10)	Paper and Paperboard HS Code 48	(10)	
India		938 (7)	I		

Source: Statistics New Zealand.

For the purpose of this study only the top six destinations consisting of Australia, PRC, Japan, Korea, USA, and UK have been considered. (Table-2) as they account for about 90% of NZ's merchandise exports. Accordingly, the top 10 commodities exported to these selected destinations have been included (Table-3). These countries also appear in the list of top 10 destinations in 2005 as well as in 2011 but their rankings have changed.

TABLE 2: NZ'S TOP 10 (SELECTED COMM.) EXPORTS TO SELECTED (TOP 6) destinations (US$ m) (2005)

Destination(j) / Commodity(i)	**Total**	Aus	USA	Japan	UK	Korea	PRC
Milk powder, Butter and Cheese HS Code 0401-0406	**971**	177	295	188	36	57	218
Meat and Edible Offal HS Code 02	**1729**	19	809	265	405	199	32
Logs, Wood and Wood articles HS Code 44	**1226**	273	313	376	1	154	109
Crude oil HS Code 2709	**256**	200	0	56	0	0	0
Mechanical Machinery and Equipment HS Code 84	**731**	448	202	12	42	11	16
Fruit &Nuts HS Code 0803-0814	**421**	49	74	168	86	40	4
Fish HS Code 03	**472**	115	144	109	12	25	67
Aluminium and Aluminium articles HS Code 76	**655**	76	92	407	20	45	15
Wine HS Code 22	**245**	59	71	4	111	0	0
Electrical Machinery and Equipment HS Code85	**433**	191	133	20	63	6	20
Total	**7,139**	**1,607**	**2,133**	**1,605**	**776**	**537**	**481**

Source: Statistics New Zealand (**UNCOMTRADE**)

TABLE 3: NZ'S TOP 10 (SELECTED COMM.) EXPORTS TO SELECTED (TOP 6) destinations (US$ m) (2011)

Destination(j) / Commodity(i)	**Total**	Aus	USA	Japan	UK	Korea	PRC
Milk powder, Butter and Cheese HS Code 0401-0406	**2882**	381	341	285	25	118	1732
Meat and Edible Offal HS Code 02	**1930**	36	851	252	515	154	122
Logs, Wood and Wood articles HS Code 44	**1941**	328	160	323	2	264	864
Crude oil HS Code 2709	**1515**	1455	0	0	0	60	0
Mechanical Machinery and Equipment HS Code 84	**699**	451	156	15	41	9	27
Fruit &Nuts HS Code 0803-0814	**545**	88	77	233	35	54	58
Fish HS Code 03	**627**	184	138	98	9	35	163
Aluminium and Aluminium articles HS Code 76	**807**	89	58	493	47	100	20
Wine HS Code 22	**693**	264	180	9	229	1	10
Electrical Machinery and Equipment HS Code85	**499**	274	126	22	31	16	30
Total	**12,138**	**3,550**	**2,087**	**1,730**	**934**	**811**	**3026**

Source: Statistics New Zealand (**UNCOMTRADE**)

Thus, there is a clear indication that during the period of study there has been an overall increase in NZ's merchandise exports in 2011 over 2005, changes in the market structure as well as commodity composition. This paper applies shift-share analysis to assess the contribution of a global component (GLOBO) indicating changes due to overall growth in world trade, a geographical component (GEO) indicating changes due to the country's distribution of trading partners, a

product composition component (COMPO) indicating growth due to the mix of products exported, and a residual term indicating changes in competitiveness, or performance (PERFO). The first 3 components, GLOBO, COMPO and GEO all relate to what the change in trade would be if trade changes proportionally. The fourth and residual component, PERFO, refers to the trade that "shifts away" from expected proportional changes, hence the term *shift-share analysis* (*Piezas-Jerbi and Nee 2009)*.

LITERATURE REVIEW

Shift share analysis is a popular method used in economic studies to identify the sources of differences in regional and national economic, employment and export growth rates. Berzeg (1978) in his study on the empirical content of shift share technique concluded that the technique has been one of the main tools to analyse not only growth rates by region and industry but also to study other economic problems. Relative simplicity and reasonable accuracy are the two main reasons for the popularity of this technique. Nazara and Hewings (2004) attributed the technique's wide usability to its ability to capture the underlining changes in the variables under consideration. Shi and Yang (2008) observed that although the shift share technique is relatively simple requiring modest amounts of data the analysis is reasonably accurate. That the technique is versatile, in that it can be used to study a variety of economic issues is well established in economic literature.

Tu and Sui (2011) applied shift share analysis to investigate the regional patterns of structural transitions and contributing factors behind the changes in the state of Texas. They found that the emergence of an information economy may precipitate further spatially differentiated growth in different regions of the state. Robson (2008) applied the shift share analysis to decompose the employment growth in South East Queensland during the decade 1991-2001. He found that most of the growth in employment came from national growth while changes in regional industry mix contributed the smallest portion of the employment growth.

Shift-share analysis is also extensively used to analyse various aspects of a country's export performance. The method can be used to measure the changes in the export competitiveness, the relative gains or losses of export markets and the changes in export performance due to the country's distribution of trading partners. Shift-share analysis can also be applied to identify market potential and growth in a region and to identify the best market for a specific product. The technique is appropriate for the initial screening phase of the export opportunity identification process. The analysis provides a representation of changes in import growth or decline, and it is useful for targeting countries that might offer significant future opportunities (Rubin 2005).

Srivatsava (2010) applied shift share analysis to assess the impact of the phase-out of the Multi-Fibre Agreement on the exports of textile products by India during the years 1996-2006. He noted that when applied to the study of export growth, shift –share analysis measures the relative gain or loss of export markets to overall export growth. The net shift in export is a better measure of export market performance compared to absolute and relative changes in export growth. Shift share analysis also takes into account both size and growth of a particular market when assessing its export performance with another market.

Peh and Wong (1999) applied shift share analysis to study Singapore's export market growth during 1991-96. They computed the net shifts in export markets by analysing the industry mix, regional, and interaction effects. They concluded that the regional economies played a significant role in expanding Singapore's exports during the study period.

The technique can also be used to compare the export performance of a country in relation to a particular industry *vis a vis* its rivals in a major export market. Wu and Kumarapathy (1998) used shift share analysis to analyse Singapore's competitiveness in electronic exports to the United States. They found that although there was an improvement in Singapore's overall competitiveness, it lagged behind its regional rivals i.e. Malaysia, China and the Philippines.

Ballingall and Briggs (2001) compared Australia's and New Zealand's export performance during three time periods 1970-85; 1985-1993, and 1993-99. The three variables considered include the growth in world trade, commodity composition, and competitiveness. It was found that Australia's competitiveness increased since 1985 whereas New Zealand's competitiveness decreased during the same period. In this study a new component viz., GEO is added to evaluate the effects on NZ's total merchandise exports that can be attributed to the distribution of trading partners in addition to the above three components.

METHODOLOGY

This study applies the methodology used by PIEZAS-JERBI and NEE (2009).

In their study of *Market Shares In The Post-Uruguay Round Era* an extended shift share analysis was used to decompose the growth in exports to four components viz., a global component (GLOBO) indicating changes due to overall growth in world trade, a geographical component (GEO) indicating changes due to the country's distribution of trading partners, a product composition component (COMPO) indicating growth due to the mix of products exported, and a residual term indicating changes in competitiveness, or performance (PERFO). The advantage of this method is that it is possible to clearly identify the trading partner effect on the export performance.

$$V'_{..} - V_{..} = \Sigma i \Sigma j\, r_{ij}V_{ij} + \Sigma i \Sigma j\,(V'_{ij} - V_{ij} - r_{ij}V_{ij})$$

$$= rV_{..} + \Sigma i(r_i - r)V_{i.} + \Sigma i \Sigma j(r_{ij} - r_i)V_{ij} + \Sigma i \Sigma j(V'_{ij} - v_{ij} - r_{ij}V_{ij})$$

(1) (2) (3) (4) (*Piezas-Jerbi and Nee 2009)*

Where:

V_i = the value of country A's exports of product i in period 1,
V'_i = the value of country A's exports of product i in period 2,
$V_{.j}$ = the value of country A's exports to country j in period 1,
$V'_{.j}$ = the value of country A's exports to country j in period 2,
V_{ij} = the value of country A's exports of product i to country j in period 1,
V'_{ij} = the value of country A's exports of product i to country j in period 2,
r = percentage change in world exports between periods 1 and 2,
r_i = percentage change in world exports of product i between periods 1 and 2,
r_{ij} = percentage change in world exports of product i to country j between periods 1 and 2.

RESULTS AND DISCUSSION

NZ's total exports of top 10 commodities increased by US$ 4,999m i.e. a 70% increase in 2011 over 2005. The final result of the shift-share analysis which is used to disaggregate the total increase in exports are presented below (refer to appendix-1 for detailed calculations).

4,999 = 5712 - 266 - 1462 + 1015
100% = (114)% - (5%) - (29%) + (20%)
(Globo) (Compo) (Geo) (Perfo)

The *Globo* component indicates that NZ's exports would have been114% of the total increase had the actual growth rate was equivalent to world growth rate. The results indicate that the growth in NZ's exports was largely due to growth in world exports implying a substantial rise in the global demand for these commodities overall during the study period.

The second term of the equation *Compo* indicates that the composition of exports contributed a negative 5% to the overall exports i.e. the mix of the commodities exported had a negative effect on the export growth. This is the per cent share of exports lost due to global behaviour of the individual commodity groups. A contributing factor is the fact that NZ's growth rate in high value added products such as aluminium articles, electrical machinery, and mechanical machinery has been far less than the world growth rate (Talbe-4).

The third term *Geo* i.e., the distribution of trading partners also had a negative influence on NZ's exports. The decomposition of the total increase in exports shows that 29% share of the exports was lost due to the behaviour of the six individual trading partners.
Finally, the residual term *Perfo* had a 20% positive influence on the total exports implying that NZ's exports increased by 20% due to competitiveness.

CONCLUSIONS

Firstly, there was an overall increase in the exports of selected commodities by the selected countries *albeit* of varying degrees during the period of the study (Table-4). There has been a 70% increase (the second highest) in NZ's exports of the selected commodities to the selected destinations (Table 2 & Table 3) as against 80% increase in world exports of the selected commodities during the study period. PRC achieved the highest growth rate of 109% (Table-4). Seconldy, with regard to individual commodities NZ recorded the highest export growth rate of 492% as against world's 53% for crude oil followed by milk powder, butter and cheese. Other commodities that exceeded the world growth rate are wine with a growth rate of 183% as against world's growth rate of 25%, dairy products achieved 197% increase and timber also exceeded the world growth rate. All these commodities are primary or land based products i.e. NZ's export growth of land based products is comparable to world's growth rate. A point to be noted in this regard is the fact that world's largest growth rate of 120% relates to Electrical Machinery and Equipment for which NZ recorded a 15% growth rate which is far less than the world growth rate. This is an indication that NZ lacks competitiveness in technology based exports. This is also evident from the fact that composition of commodities had a negative effect indicating that the world growth rate for these commodities was less than the overall world growth in exports. Thirdly, the distribution of trading partners had a negative impact as the growth rate of exports of selected commodities to these destinations was less than the overall world export growth rate of these commodities. Some of these countries which are in NZ's top 6 export destinations such as the US are also major exporters of similar commodities e.g. dairy, meat, timber and aluminium articles (Table-5). Given this the Geo component can be expected to be negative unless there is a change in NZ's export market structure. Finally, although the term Perfo had a positive influence, Perfo is an indicator of competitiveness in a broad sense. This is because the term merely indicates a country's potential to increase its exports beyond what can be attributed to *Globo, Compo,* and *Geo* effects (*Piezas-Jerbi and Nee, 2009)*. To conclude, the decomposition of the *Globo, Compo, Geo*, *and Perfo* indicate that NZ was competitive enough to be able to increase its exports in line with world exports. Further research needs to be done on the impact of macroeconomic policies e.g. foreign trade policies to isolate their influence on the *Perfo* term.

TABLE-4: WORLD* GROWTH RATE IN TOP 10 COMMODITIES 2005-2011

Year / Commodity	2005 (US$ m)	2011 (US$ m)	% Change
HS0401-0406 Milk powder, Butter and Cheese	7737	16865	118
HS02 Meat and Edible Offal	16309	29748	82
HS44 Logs, Wood and Wood articles	15546	23620	52
HS2709 Crude oil	28378	43329	53
HS0801-14 Fruit &Nuts	9139	17257	89
HS03 Fish	12976	23203	79
HS76 Aluminium and Aluminium articles	25031	46871	87
HS2204-05 Wine	3923	4918	25
HS85 Electrical Machinery and Equipment	404953	890049	120
HS84 Mechanical Machinery and Equipment	543107	864660	59

Source: UNCOMTRADE *Consists of NZ, Aus, Japan, Korea, PRC, USA and UK.

TABLE-5: TOTAL EXPORTS BY SELECTED DESTINATIONS 2005-2011

Destination (j) / Product (i)	Percentage change. % (r)							
	Total	NZ	Aus	Japan	Korea	PRC	USA	UK
Total (7)	**80**	**70**	**26**	**28**	**55**	**109**	**24**	**2**
HS0401-0406 Milk powder, Butter and Cheese	118	197	26	0	0	0	394	73
HS02 Meat and Edible Offal	82	12	0.36	0	0	0	228	26
HS44 Logs, Wood and Wood articles	52	58	21	7	0	38	99	(-)32
HS2709 Crude oil	53	492	103	0	0	(-)14	0	(-)36
HS0801-14 Fruit &Nuts	89	29	39	0	0	59	56	0
HS03 Fish	79	33	(-)8	(-)5	88	78	26	251
HS76 Aluminium and Aluminium articles	87	23	24	33	21	85	141	(-)21
HS2204-05 Wine	25	183	(-)25	0	0	0	79	(-)14
HS85 Electrical Machinery and Equipment	120	15	26	9	57	110	7	(-)6
HS84 Mechanical Machinery and Equipment	59	(-)4	32	46	52	117	15	20

Source: Calculations based on UNCOMTRADE database.

APPENDIX-1

Calculation of classic shift-share, NZ total exports of top 10 commodities, 2005-2011 (US$m)
Total change in NZ's exports of top 10 commodities = V"-V = 12,138 - 7,139 = 4,999
(1) GLOBO = r*V = (80/100*971) + (80/100*1729)…… + (80/100*433) = 5,712
(2) COMPO = ∑ (ri-r)Vi = (1.18-.8)*971 + (0.82-0.8)*1729…….+(0.59-0.80)*433 = (-) 266
(3) GEO = ∑i∑j(rij-ri)Vij = (0.26-1.18)*177 + (3.94-1.18)*295 ……+ (0.20-0.59)*42 = (-)1462
(4) PERFO = ∑i∑j(V'ij-Vij-rijVij) = (381-177) - (0.26*177) + (36-19) - (0.004*19)…… + (30-20) – (1.10*20) = 1015

(1) GLOBO = r*V = (80/100*971) + (80/100*1729) + (80/100*1226) + (80/100*256) +
(80/100*731) + (80/100*421) + (80/100*472) + (80/100*655) +
(80/100*245) + (80/100*433) = 5,712

(2) COMPO = ∑ (ri-r)Vi = (1.18-.8)*971 + (0.82-0.8)*1729 + (0.52-0.80)*1226 + …
(0.53-0.80)*256 + (0.89-0.80)*731 + (0.79-0.80)*421 +
(0.87-0.80)*472 + (0.25-0.80)*655 + (1.20-0.80)*245 +
(0.59-0.80)*433 = (-) 266

(3) GEO = ∑i∑j(rij-ri)Vij = (0.26-1.18)*177 + (3.94-1.18)*295 + (0.73-1.18)*36 +
(0-1.18)*188+ (0-1.18)*57 +(0-1.18)*218 = 89
= (.004-.82)*19 + (2.28-0.82)*809 + (0.26-0.82)*405 +(0-.82)*265 +
(0-.82)*199 + (0-0.82)*32 = 532
= (0.21-0.52)*273 + (0.07-0.52)*376 + (0.38-0.52)*109 +
(0.99-.52)*313+ (0-.52)*154 = (- 203)
= (1.03-.53)*200 + (0-.53)*56 = 70
= (0.39-0.89)*49 + (0.59-0.89)*4 + (0.56-0.89)*74 +(0-.89)*168 +
(0-.89)*86 +(0-.89)*40 = (-312)
= (-.87)*115 + (-0.84)*109 + (0.88-0.79)*25 + (0.78-0.79)*67 +
(0.26-0.79)*144 + (2.51-0.79)*12 = (-)246
= (0.24-0.87)*76 + (0.33-0.87)*407 + (0.21-0.87)*45 +(0.85-0.87)*15 +
(1.41-0.87)*92 +(-21.87)*20 = (-685)
= (-.5)*59 + (0.79-0.25)*71 + (-0.39)*111 + (0-.25)*71 = (-52)
= (0.26-1.2)*191 + (0.09-1.2)*20 + (0.57-1.2)*6 + (1.10-1.20)*20 +
(0.07-1.20)*133 + (-1.26)*63 = (-437)
= (.32-.59)*448 + (.46-.59)*12 + (.52-.59)*11 + (1.17-0.59)*16 +
(0.15-0.59)*202 + (0.20-0.59)*42 = (-219)
= (-)1462

(4) PERFO = ∑i∑j(V'ij-Vij-rijVij)

Aus = (381-177) - (0.26*177) + (36-19) - (0.004*19) + (328-273) - (0.21*273) + (1455-200) - (1.03*200) + (451-448) - (0.32*448) + (88-49) - (0.39*49) + (184-115) - (-.08*115) + (89-76) - (0.24*76) + (264-59) –
(-.25*59) + (274-191) -(0.26*191) = 1427

USA = (341-295) - (3.94*295) + (851-809) - (2.28*809) + (160-313) - (0.99*313) + (156-202) - (0.15*202) + (77-74) - (0.56*74) + (138-144) - (.26*144) + (58-92) - (1.41*92) + (180-71) - (0.79*71) + (126-133) - (0.07*133) = (-3353)

Japan = (323-376) - (0.07*376) + (15-12) - (0.46*12) + (98-109) - (-.05*109) + (493-407) - (0.33*407) + (22-20)-(0.09*20) = (-135) (285-188) + (-13) + (233-168) (5) = 19

UK = (25-36) - (0.73*36) + (515-405) - (0.26*405) + (41-42) - (0.20*42) + (9-12) - (2.51*12) + (47-20) - (-.21*20) + (229-111) - (-.14*111) + (31-63) + (-.06*63) = 14

Korea = (35-25) - (0.88*25) + (100-45) - (0.21*45) + (16-6) - (0.57*6) (118-57) + (154-199) + (264-154) + (60) + (14) = 241

PRC = (1732-218) + (122-32) + (864-109) - (0.38*109) + (27-16) - (1.17*16) + (58-4) - (0.59*4) + (163-67) - (.78*67) + (20-15) - (0.85*15) + (10) + (30-20) - (1.10*20) = 2667
=1015

PS: Values have been adjusted to the nearest million.

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