

RECENT TRENDS OF NEW ZEALAND'S INTERNATIONAL FREIGHT TRANSPORT

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ABSTRACT

This paper investigates the extent to which New Zealand's international freight transport is recovering from the 2008 global financial crisis. It then compares the trends with those in the European Union and the USA. We also discuss changes in transport modal shares, key commodity types and freight movements between New Zealand and its key trading partners. Monthly volume and value data on international merchandise trade by mode (sea and air) over the time period from January 2005 to December 2011 have been analysed. Key findings include that New Zealand's international freight volume by sea has recovered quickly to surpass its pre-crisis peak level (June 2008), with growth in exports being stronger than imports. In contrast, New Zealand's international freight volume by air has stagnated in the last couple of years. Moreover, the share of air freight in export volume has declined and recent years have seen a significant redistribution of freight transport between New Zealand and its key trading partners.

Key words: commodity types, financial crisis, international freight transport, mode share, trading partners.

1 INTRODUCTION

The 2008 global financial crisis and the consequent economic downturn have significantly impacted on international trade (Escaith et al., 2010). The year 2009 recorded the sharpest trade decline in more than seven decades, with world merchandise export volumes estimated to have plummeted by nearly 14%. In terms of value, world merchandise exports fell by 23% (UNCTAD, 2010). The pre-crisis world economy has been characterised by high trade intensity, with trade growing considerably faster than output.

The International Transport Forum (ITF) has recently been monitoring the recovery of global freight transport particularly in the European Union (EU27) and the United States of America (USA) (ITF, 2011a, 2011b, 2011c, 2011d and 2012). Based on data up to December 2011, the ITF (2012) found that after initial quick recovery, recent global freight transport remained stagnant (see Appendix 1). Below are their key findings:

- total external trade (in tonnes) by sea has stagnated below pre-crisis peak (June 2008) levels both in the EU27 and the USA;
- external trade by air indicates further decline and total trade by air both in the EU27 and the USA has fallen back to their pre-crisis levels;

¹ The opinions expressed in this paper are those of the authors, and do not necessarily represent the views of the Ministry of Transport.

- export and import volumes display different post-crisis recovery patterns, with tonnes exported generally growing more strongly than tonnes imported;
- advanced economies' demand remains weak while developing economies show resilience.

As a small country, international trade is important for New Zealand's prosperity. Over the last decade, total value of international merchandise trade has fluctuated around 45% of the nation's gross domestic product (GDP). In this paper we investigate the extent to which New Zealand's international freight transport is recovering from the global trade downturn. We then compare the trends with those in the EU27 and the USA. We also discuss transport modal shares and the redistribution of freight movements between New Zealand and its key trading partners, as well as the likely implications for the freight transport industry.

2 DATA SOURCES AND DATA ANALYSIS

Statistics New Zealand provided monthly merchandise trade and GDP data over the time period from January 2005 to December 2011. NZ Ministry of Economic Development provided oil price data and Reserve Bank of New Zealand for the exchange rates. Note that when total freight volumes and values were calculated, those by parcel post were excluded for two reasons: firstly the inability to differentiate between air and sea mode and secondly a lack of materiality (generally less than 1%).

To filter out usual seasonal fluctuations and irregular factors, seasonal adjustment was performed for the merchandise trade data using the Census X12 ARIMA programme in the EViews software package.

3 RECOVERY OF NEW ZEALAND'S INTERNATIONAL FREIGHT TRANSPORT

To facilitate comparison with the trends for the EU27 and the USA, recovery of New Zealand's international freight transport is studied by looking at percentage changes from the pre-crisis peak in June 2008 (Figures 1 and 2). The seasonal adjusted freight volumes and values during the time period from January 2005 to December 2011 are illustrated in Appendix 2. As seen in Figures 1 and 2, the financial crisis has also impacted on New Zealand's international trade and freight transport.

3.1 International freight transport by volume

International freight transport volume (in terms of gross weight) by sea in New Zealand has recovered quickly (Figure 1a). The total volume surpassed its pre-crisis peak in early 2010 and has been more than 10% above the June 2008 level since October 2010. Recovery of sea freight transport has largely resulted from the strong growth in exports by sea. However, import volume by sea has not fully recovered from the recession and was still below the pre-crisis level at the end of 2011. The patterns are similar to those for the EU27 and the USA (see Appendix 1) although exports by sea in New Zealand have grown more strongly (more than 20% above the pre-crisis peak since October 2010) by comparison.

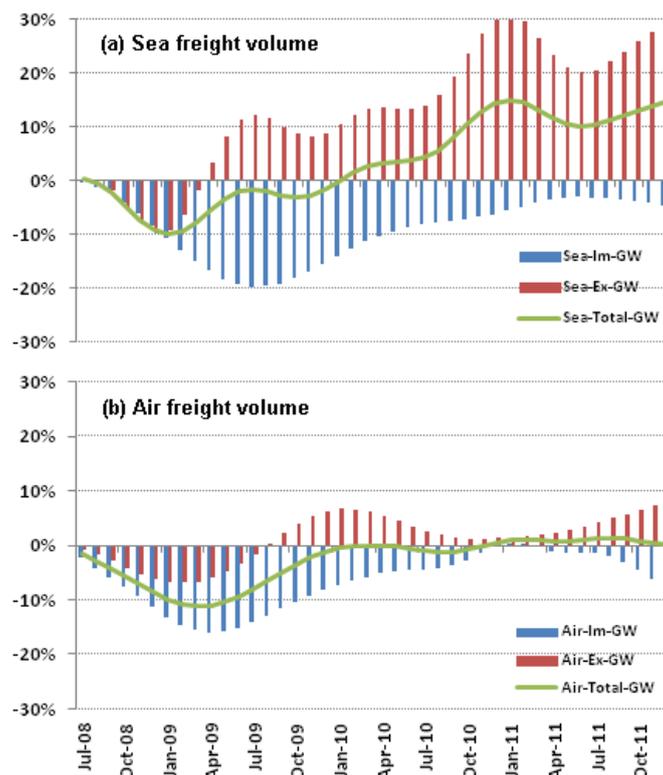


Figure 1. International freight transport volume in New Zealand, percentage changes from the pre-crisis peak in June 2008 (monthly trends, seasonally adjusted)

Notes: Im = imports, Ex = exports, GW = gross weight.

Over the past seven years, New Zealand's freight volume exported by sea has been consistently higher than that imported and the gap has widened since early 2009. The ratio of exports to imports in terms of shipping volume was 1.7 in the three years to 2011 (compared to between 1.2 and 1.3 from 2005 to 2008).

The trade imbalance has resulted in an imbalance between empty containers imported and exported for New Zealand, with imported being more than double exported in 2008 as found in a study (CTS and Njord, 2009). This could be an issue as it may have efficiency implication. There were also considerable imbalances for reefer containers [imported 28,000 twenty-foot equivalent units (TEUs) but exported 192,000 TEUs] and within each container size (with a surplus of 20 foot and lack of 40 foot containers). The imbalances varied among seaports. Moreover, about 110,000 TEU empty containers were moved around within New Zealand in order to meet the equipment needs for export cargo (CTS and Njord, 2009). Nevertheless, it should be noted that the year of 2008 was very volatile and the empty container movements change with international lines' call patterns. The NZ Ministry of Transport's Freight Information Gathering System (FIGS) currently under development will provide better information on the movement of containers into, out of and around New Zealand.

As seen in Figure 1b, international freight transport volume by air had recovered by around 2010 but has since then fluctuated around the June 2008 level². As in the case for sea freight, the recovery of air freight volume was mainly attributable to the improvement in exports, which has more or less offset the reduction in imports. By comparison, total air freight volumes both in the EU27 and the USA have surpassed their pre-crisis levels. New Zealand's very long distance to its trading partners might be one of the key factors limiting the growth of its air freight transport.

3.2 International freight transport by value

Considering trade value instead of volume produces a different picture (Figure 2). The growth in trade value by sea has been weaker and in aggregate terms it only started to fully recover in 2011, with imports by sea still below the June 2008 level (Figure 2a). One of the reasons for a slower improvement of seaborne trade value is the gradual increase in the value per unit weight of goods (New Zealand dollars per kilogram) for both exports and imports up to 2009 when it dropped considerably (Figure 3a). Another reason for this is the mix of goods being traded with our trading partners. For instance, forestry goods exported by sea have increased significantly since 2008, with their share in total seaborne export volume being more than 54% in 2011, up from 43% in 2008. At the same time, their value per unit of weight has dropped.

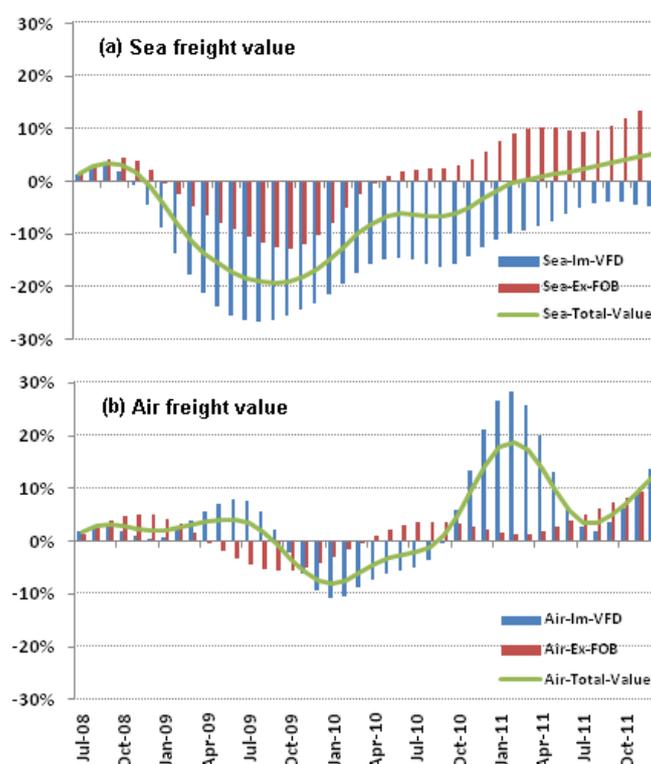


Figure 2. International freight transport value in New Zealand, percentage changes from the pre-crisis peak in June 2008 (monthly trends, seasonally adjusted)

Notes: Im = imports, Ex = exports, FOB = free on board (the value of goods at New Zealand ports before export), VFD = value for duty (the value of imports before insurance and freight costs are added).

² International freight weight by air has slightly declined since 2005 and the June 2008 level was not a peak (see Appendix 2b).

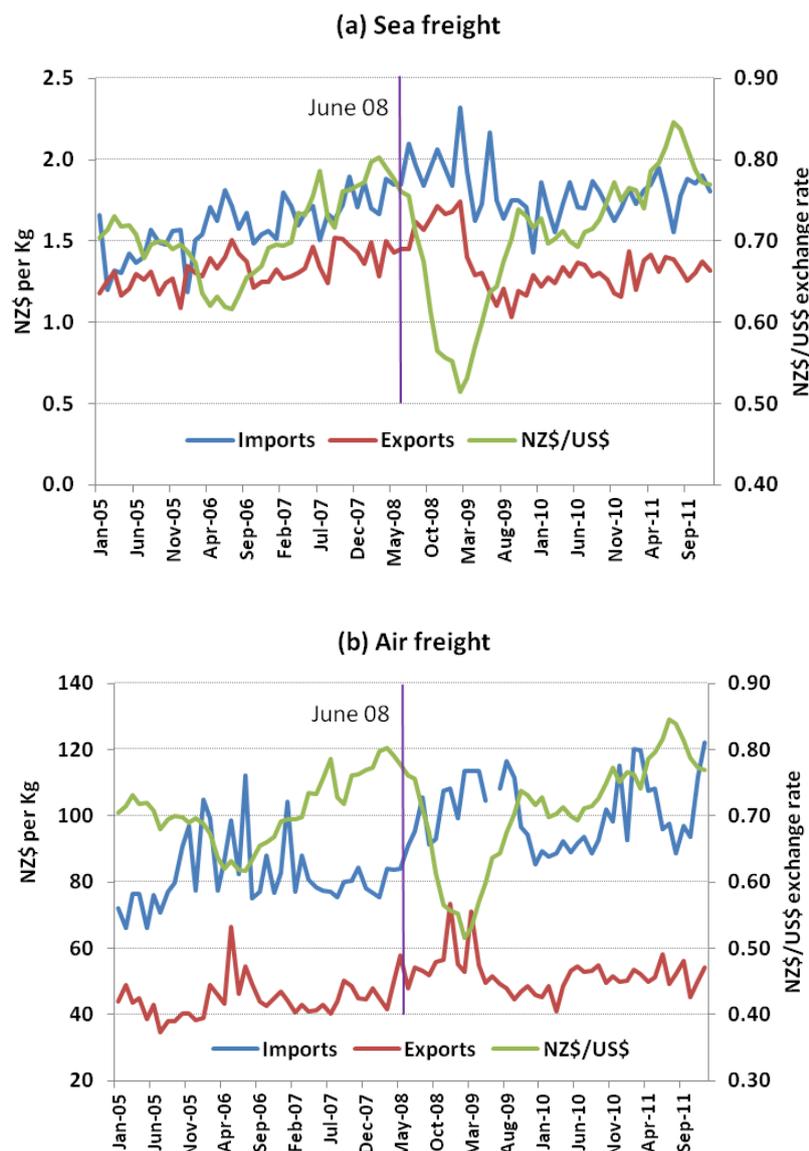


Figure 3. value per unit weight of goods in New Zealand's international transport
Notes: (1) based on seasonally adjusted monthly merchandise trade data; (2) an outlier in (b) is deleted.

Total value of air freight performed better than volume. The values for exports and imports have both recovered from the June 2008 level by late 2010 (Figure 2b). The exchange rate may have played a key role in this result. Figure 3b shows the value density of goods (New Zealand dollars per kilogram) imported by air increased when the financial crisis started. The trends of the value per unit weight of goods imported by air and the exchange rate (NZ\$ to US\$) appears to be negatively correlated except for the second half of 2010, with a R^2 of 0.43 for the data until June 2010 and 0.85 for the 2011 data.

Regardless of the New Zealand dollar's volatility, the value density of goods for imports was consistently higher than that for exports (especially for air freight) in the last seven years (Figure 3). Again, this is largely influenced by the mix of commodities we trade in, which is discussed later.

4 TRADE PATTERNS

4.1 Top trading partners

In 2011, New Zealand's top eight trading partners were Australia, China, USA, Japan, Republic of Korea, Singapore, UK, and Germany, accounting for more than 76% of New Zealand's trade value. Although Australia is still New Zealand's most important trading partner in terms of trade value, recent years have seen a significant redistribution of freight movements between New Zealand and its key trading partners (see Figures 4 and 5).

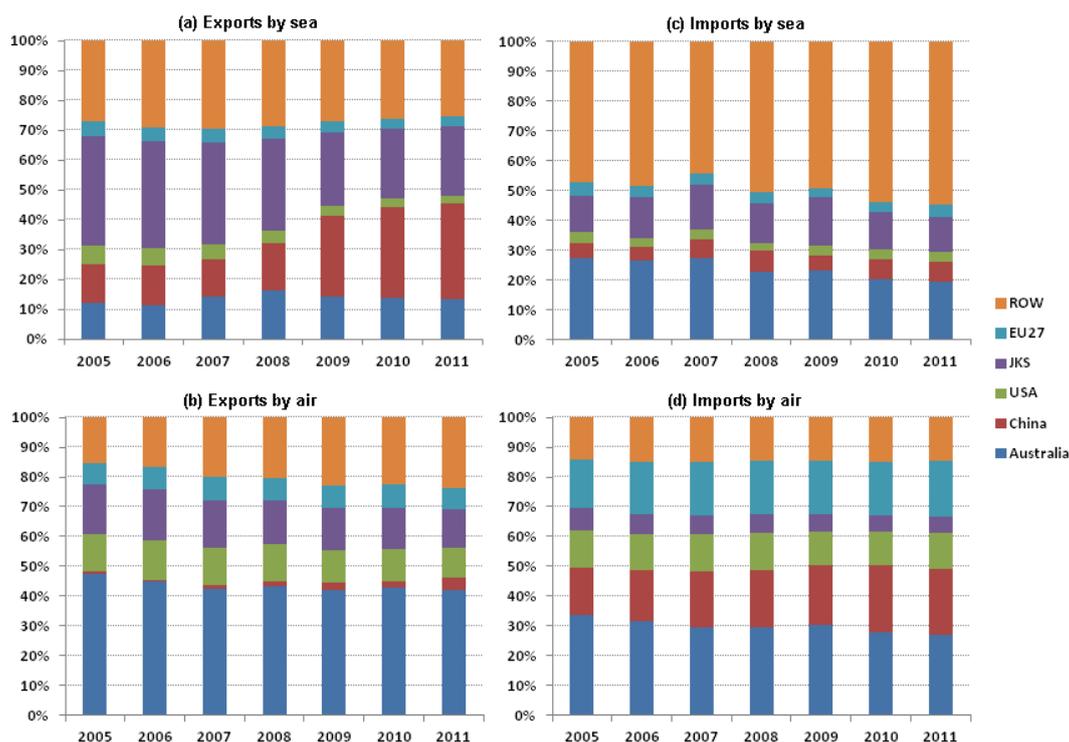


Figure 4. Share of top trading partners in New Zealand's merchandise exports and imports by volume

Notes: JKS = Japan, Republic of Korea and Singapore, ROW = rest of world.

As seen in Figure 4a, China's share in the freight volume exported by sea has increased substantially since 2008 (the New Zealand-China Free Trade Agreement came into force in October 2008), from around 16% to 32% in 2011. Currently New Zealand exports the largest freight volume by sea to China. By contrast, the proportion of freight volume exported by sea to Japan, Korea, and Singapore dropped from 36.8% to 23.6% between 2005 and 2011. Considerable decline was also observed in the shares of USA and EU27. While the relative shares of international trade have dropped slightly, Australia continues to be one of our key trading partners (particularly for imports).

Figure 4b shows that more than 40% of New Zealand's export volume by air has been to Australia, although the share has declined slightly (42.1% in 2011 down from 47.5% in 2005). The volume of freight exported to China by air has experienced a strong growth (increased by four times between 2005 and 2011). However, China's share in export volume by air is still small (just more than 4%). This is because the

amount of goods exported to China by air before the crisis was very small (below 100 tonnes in most months). The amount is still small compared with that to the USA and the EU27. Changes in the proportions of air freight volume exported to other key trading partners have been small. Exports by air to the rest of the world have increased.

In terms of seaborne imports volume (Figure 4c), the trading pattern is more diverse as around half of the imported freight volume by sea was from the regions other than the top trading partners discussed in this paper. On the other hand, the share of seaborne freight volume imported from Australia has declined from 27.5% to 19.5% between 2005 and 2011. When considering freight volume imported by air (Figure 4d), the key changes are reductions in the shares of trade with Australia, Japan, Korea and Singapore and increase in the shares of trade with China (more than 20% since 2010).

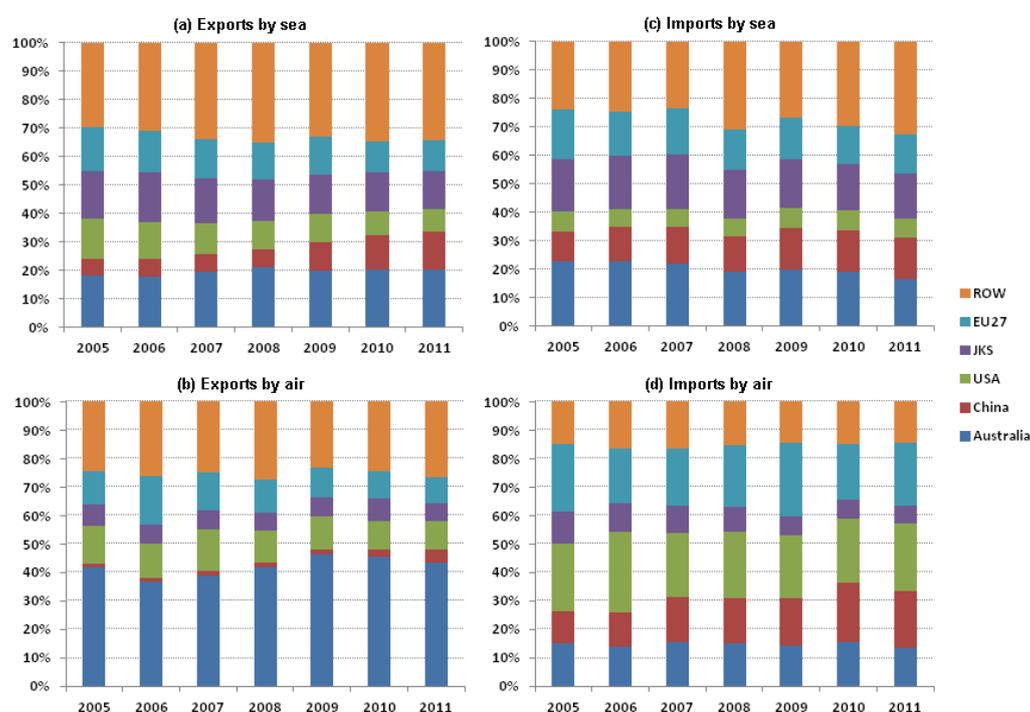


Figure 5. Share of top trading partners in New Zealand's merchandise exports and imports by value

Notes: JKS = Japan, Republic of Korea and Singapore, ROW = rest of world.

The increasing importance of China is also apparent when considering freight value (see Figure 5). However, the relative importance based on freight value is different from that in terms of freight volume. For example, although nearly one third of seaborne freight volume was exported to China in 2011 (Figure 4a), China's share in export value by sea was just 13% in that year (Figure 5a). This may have resulted from the facts that about 80% of the freight volume exported to China by sea was logs, wood and wood articles in 2011, and that these goods have much lower value density than many other commodities. Moreover, the share of value of imports by sea from the rest of the world was only about 30%, compared to 50% in terms of volume in 2011 (Figures 4c and 5c). This is because the value density of goods

imported by sea from the top trading partners was much higher than that from other regions.

4.2 Key commodity types

The value density for imports is consistently higher than for exports, for both transport modes (Figure 3). This is because the majority (eg 69% in 2009/10) of New Zealand's exports were primary products with lower added value, whereas the majority of imports were manufactured goods with higher added value (around 70%) (MFAT and SNZ, 2010).

Although dairy products contributed the most to the value of commodities exported from New Zealand, the biggest increase in New Zealand's freight volume exported by sea in the last seven years came from forestry, followed by petroleum (crude and refined)³ and dairy products. In addition, tonnes of wine exported both by sea and by air have recorded a fast increase, with the levels in 2011 being more than double those in 2005.

Not surprisingly, major commodities (by volume) exported by air from New Zealand are fruit and vegetables, sea foods, and meat due to their perishable nature⁴. Meat volume exported by air has increased since the end of 2009 while volumes of machinery and metals exported by air have declined.

The top commodities (by volume) imported to New Zealand include petroleum products, machinery and vehicles, with petroleum contributing the most to import volume. Nevertheless, tonnes of iron and steel, vehicles, and machinery imported by sea have greatly decreased after the financial crisis. Despite some recovery, their levels at the end of 2011 were still far below their pre-crisis peaks. Except for China, imports of such commodities from New Zealand's top trading partners have declined. Further research will be conducted to investigate in detail the trade patterns of important commodities between New Zealand and its key trading partners.

5 CHANGES IN MODAL SHARE

New Zealand's international freight transport is in two modes only: by air and by sea. As seen in Figure 6, sea freight has dominated the international freight transport in New Zealand as shipping by sea is the most efficient mode for long distance and massive transport of goods (IMO, 2009). Air freight represented a very small share of total transport volume, ranging from 0.34% to 0.58% in the last seven years. These are similar to that of the USA and the EU (also less than 1%) (ITF, 2011e). As shown in Figure 3, the value density of air freight is in the order of between 30 to 60 times that of sea freight. Therefore, the shares of air by value are much higher, ranging from 14% to 22%. These patterns are also similar in the USA and the EU but their shares are generally higher (ITF, 2011e).

³ The vast majority of petroleum products have been exported to Australia. Their volume had a big increase in late 2007, and has remained relatively stable since then.

⁴ Cut flowers are carried by air but have a very small weight.

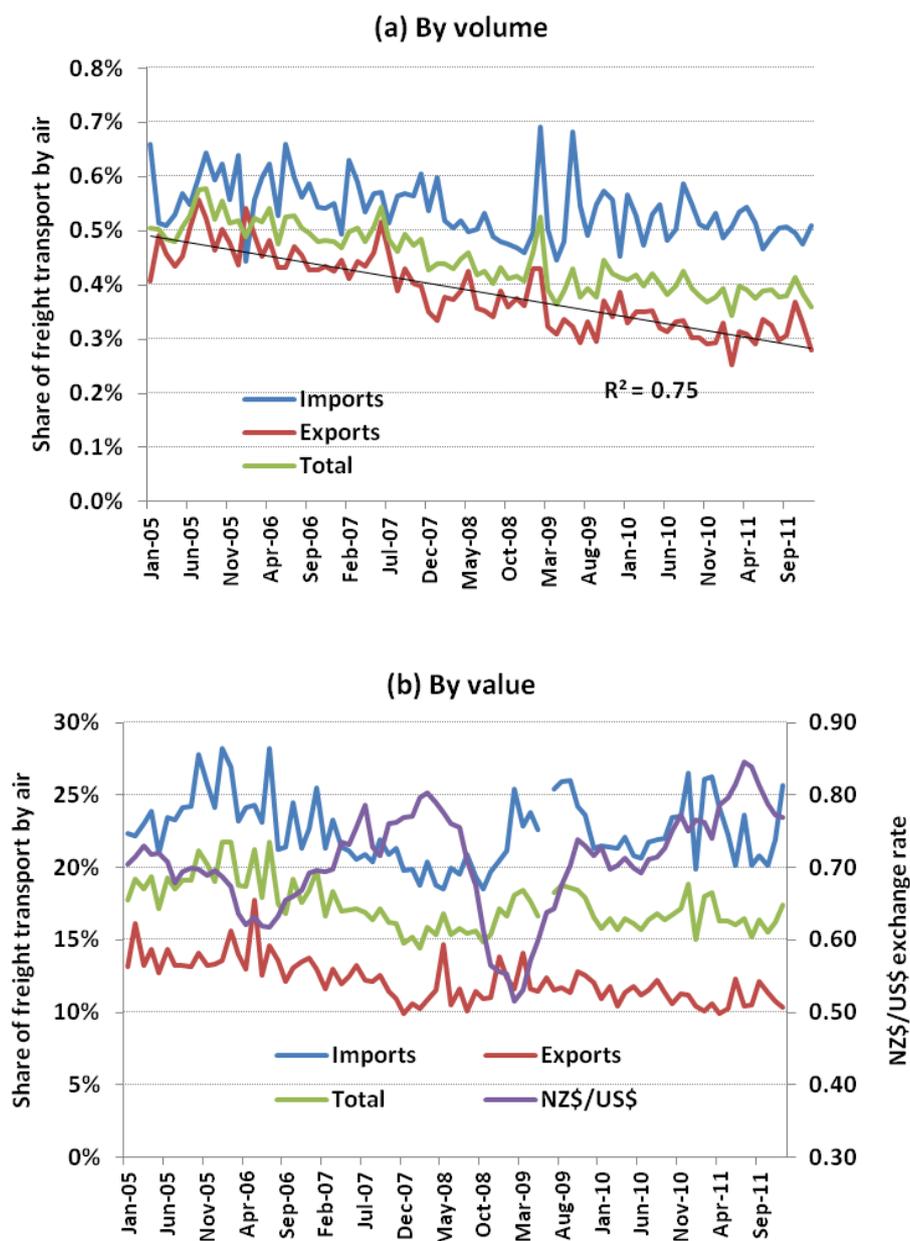


Figure 6. Share of air freight in New Zealand's international freight transport

Notes: (1) based on seasonally adjusted monthly merchandise trade data; (2) an outlier in (b) is deleted.

As shown in Figure 6a, the share of air freight by volume for exports has declined from around 0.4% in 2008 to 0.3% in 2011. However, this decreasing trend seems to be an extension of the pre-2008 trend. The share of air freight imported has remained relatively stable since 2008. As a result, the share of air freight in total international freight transport volume has only reduced marginally. In terms of actual tonnages (see Appendix 2), both air freight imported and exported by volume have improved from the trade downturn. The slight reduction in shares by air is due to the stronger growth in sea freight, particularly in the forestry and dairy sectors as discussed in section 4.2.

The increasing transport fuel prices may have also played an important role in mode choice decisions. Oil prices have increased greatly since 2005 (nearly doubled) despite a steep drop for a short time period immediately after the crisis (see Figure 7). Air transport is the most energy-intensive mode of transport and therefore is highly sensitive to the changes in fuel prices (World Bank, 2009). If higher fuel prices were translated into higher air freight rates, this would force some shippers to shift from air to sea.

Furthermore, although New Zealand remains well served for air cargo capacity, there have been numerous airline withdrawals from the market over the last decade thereby reducing capacity choice for exporters. Fuel cost is a key factor for the aviation industry and may influence the future air freight market in New Zealand.

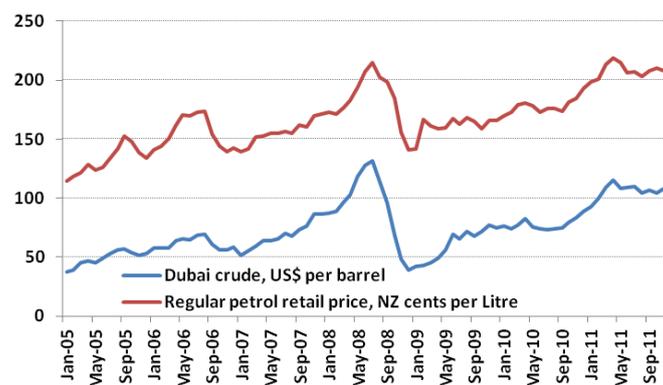


Figure 7. Oil prices over time

The share of air freight in total freight value has been relatively stable since 2008 (Figure 6b). Either in terms of volume or value, the share of air freight for imports was consistently higher than that for exports in the last seven years. This is likely because New Zealand has imported more high-valued goods than exported (and high-valued freight is more likely to be carried by air). Conversely, the share of air cargo has been higher for exports than that for imports in the USA and the EU (ITF, 2011e).

6 CONCLUSIONS

Similar to that experienced in the USA and EU, the 2008 financial crisis also impacted on New Zealand's international trade and freight transport. Overall, New Zealand exports have shown a stronger growth than imports for both sea and air freight.

Air freight represented a very small share of total transport volume in New Zealand (around 0.4% over the last 2 years), but it represented over 15% of the total international merchandise trade by value. Although Australia is still New Zealand's most important trading partner in terms of trade value, there has been a significant redistribution of freight movements between New Zealand and its key trading partners. The most pronounced change was a large increase in export volume by sea to China.

The analysis has identified two key issues. Firstly, the imbalance between export and import volumes by sea has been widening, resulting in a large amount of empty containers transported. Furthermore, the value density of goods for imports was consistently higher than that for exports in the last seven years. Both of these trends can have important implications regarding the performance of New Zealand's freight transport industry.

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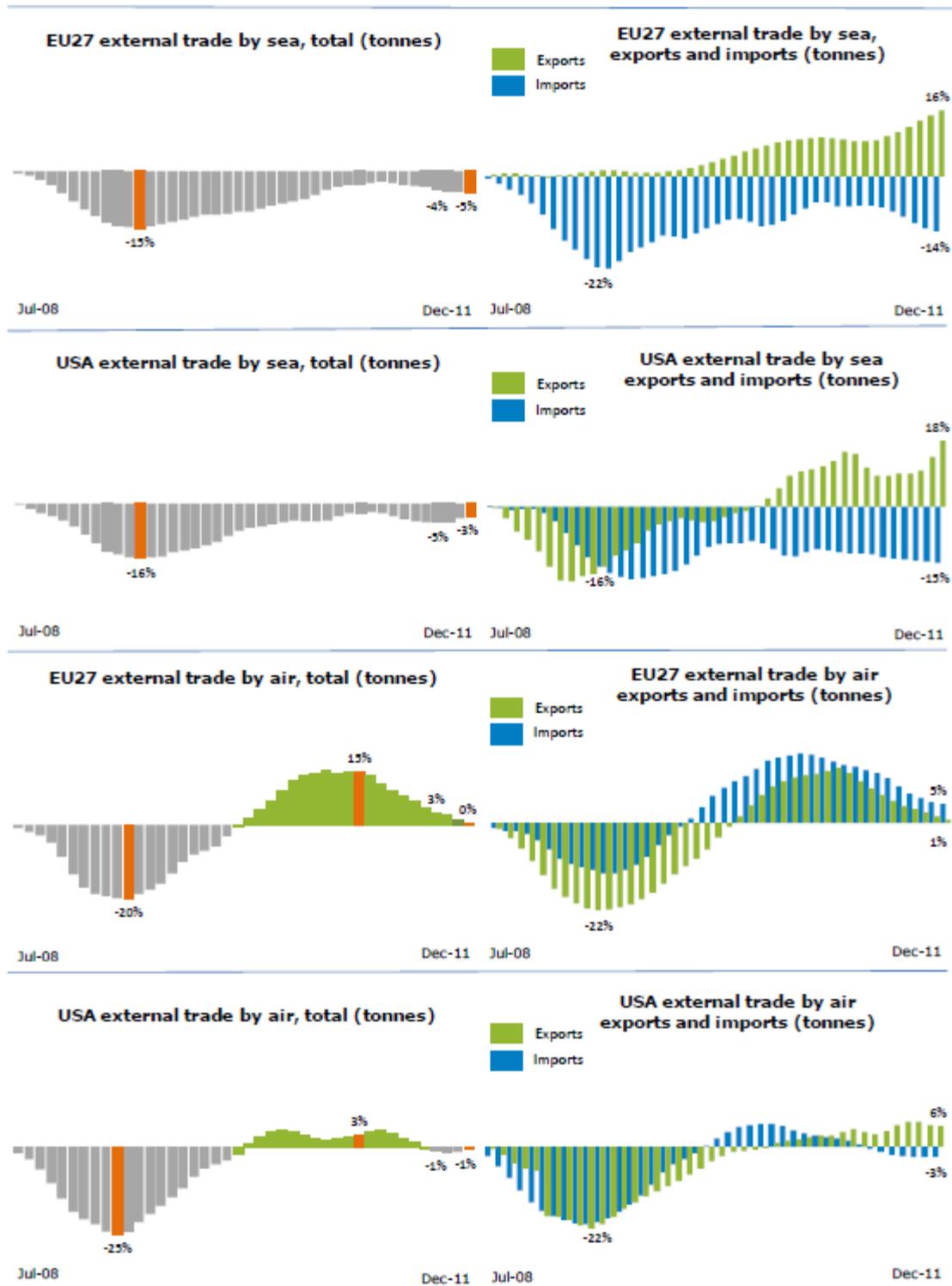
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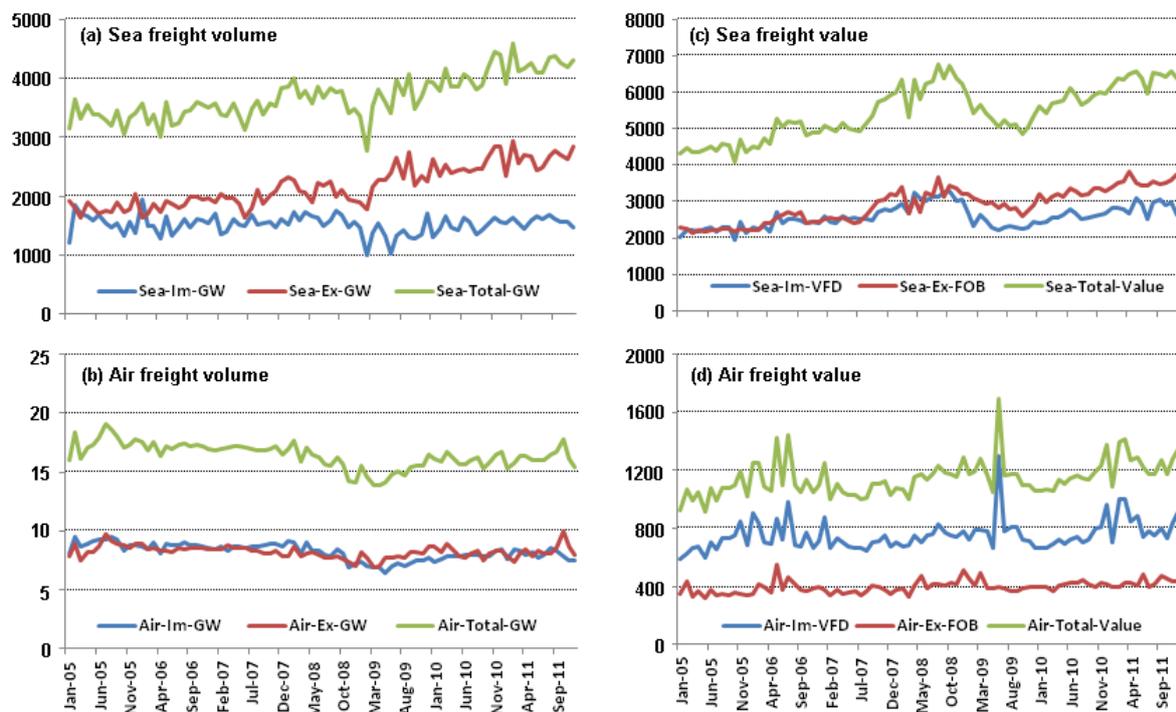
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Appendix 1: External trade in the EU27 and the USA, percentage change from pre-crisis peak of June 2008 (tonnes, monthly trend, seasonally adjusted)



Source: ITF, 2012.

Appendix 2: International freight transport volumes (million tonnes) and value (million NZ dollars) in New Zealand, January 2005 to December 2011 (monthly seasonally adjusted)



Notes: Im = imports, Ex = exports, GW = gross weight, VFD = value for duty (the value of imports before insurance and freight costs are added), FOB = free on board (the value of goods at New Zealand ports before export).