

Are non-tariff measures important in exports of finished wood products to Japan, China and the US? The case of prefabricated houses

Andres Katz¹

Abstract

New Zealand exporters of prefabricated houses were surveyed for their views on the major barriers faced in exporting to Japan, China and the US. In Japan the major challenges were identifying local rules and regulations, adapting building design to ensure conformance, and obtaining the necessary engineering approvals. In China, a major concern was the protection of intellectual property. In the US a major barrier to market entry was the cost of obtaining the required engineering certificates. The most important factors for long term success was having the right overseas partners and having sufficient resources to continue exports during market downturns or when there is strong demand from the domestic market.

Keywords: Non-tariff measures, export markets, market development, prefabricated houses

Introduction and objectives

New Zealand's primary industries are major contributors to economic growth. Most production is aimed at international commodity markets. However commodity markets are associated with greater competition, volatile demand, and lower economic benefits. To fully realise the potential of New Zealand's primary industries, exports of added-value products will need to grow significantly (MFAT 2007).

Exports of wood products reflect this focus on commodities. Very few products are manufactured and finished in New Zealand, most are exported in raw or semi processed form. This situation is not likely to change in the near future as exporters have found it difficult to find profitable niches in large high-income markets. A possible issue for exporters is that of market access.

Market access is the transparent and equitable application of the rules and regulations that govern the sale and utilisation of exports in overseas markets, and is fundamental to free trade. World Trade Organisation (WTO) negotiations aim to reduce trade barriers that distort and inhibit international trade. While there has been significant success in lowering tariff barriers, a simultaneous rise in non-tariff measures (NTMs) have also been reported (APEC 1999).

Tariffs tend to raise the prices of imported goods and make them less competitive in importing countries.

NTMs also have the ability to increase costs. NTMs can be found in government laws, regulations policies and or practices (APEC 1999). They are often very hard to identify. Also not all such measures are "bad" - some are based on legitimate goals, such as safety and protection of human health (MFAT 2007). The aim of trade policy is to identify and eliminate those that do not have a legitimate basis or unfairly disadvantage the imported product.

One of the few product categories where wood is exported in finished form is prefabricated houses. These houses contain high added-value components and showcase New Zealand wood products in areas less well represented in other exports. They can also act as a conduit for the exports of other products such as aluminium joinery, roofing and insulation materials.

The WTO (2005) found that non-tariff barriers related to building codes were a problem for the global forest products industry. These were found in national or regional technical regulations and standards, conformance assessment requirements, overly restrictive limits on use of wood products and lack of enforcement of technical regulations. In particular the WTO was concerned that standards often did not conform to WTO principles regarding transparency, openness, consensus and impartiality, for example by raising costs and establishing criteria that favoured domestic producers.

The purpose of this study was to identify the NTMs that affected New Zealand prefabricated house exports to Japan, China and the US. These countries are the largest wood product markets in the Asia-Pacific region and significant importers of New Zealand wood.

¹ Alphametrik
PO Box 11-345
Auckland 1542, New Zealand
Ph: +64 9 579 8303
Fax +64 9 579 2075
andres.katz@alphametrik.com

The Market for prefabricated houses in Japan, China and US

The potential for exports of New Zealand prefabricated houses is based on New Zealand's raw material, labour and processing cost advantage, and efficient building systems.

New Zealand prefabricated house manufacturers have exported for a considerable period of time. During this time they have regularly engaged in market development activities, often with assistance by New Zealand Trade and Enterprise. From 1997 to 2004 exports grew by 10% per annum, to a total value of 27 million dollars. However exports have since halved. This downturn coincided with a strongly appreciating New Zealand dollar and a stronger domestic market. Exports to Japan, China and US were even more strongly affected (Figure 1), as exporters switched their attention to the domestic market and emerging opportunities in the Pacific, particularly supplying buildings to resort developments.

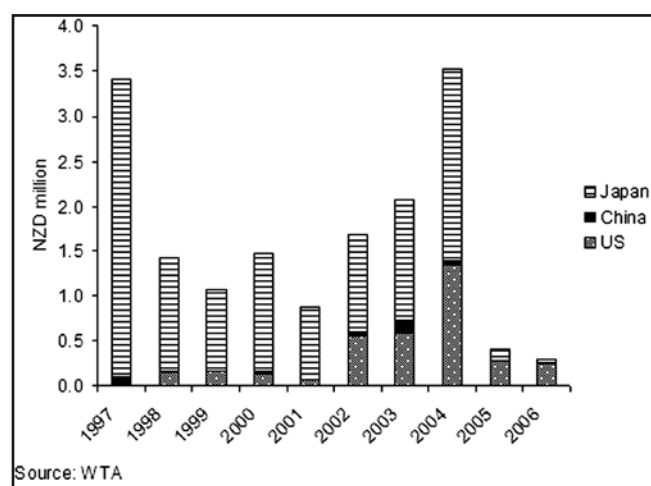


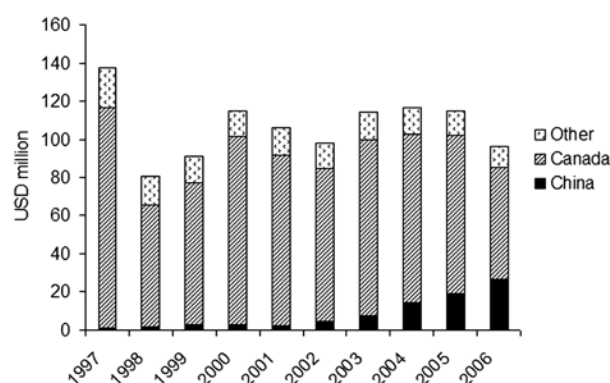
Figure 1. New Zealand exports of prefabricated houses to Japan, US and China

Japan has traditionally been an important market for New Zealand prefabricated house exports. Japan regularly builds over a million new houses every year, a large proportion of which are made of wood. The opportunity to service the most affluent market in Asia has also attracted suppliers from other parts of the world. Japan's annual imports of prefabricated houses grew to approximately USD 100 million in 2006 (Figure 2a)². Canadian suppliers have captured the largest share but China has also become an important supplier with its share growing from 4% in 2002 to 26% in 2006. Meanwhile New Zealand exports have reduced in importance particularly after the Asian crisis in the latter part of the 1990's and again after 2004.

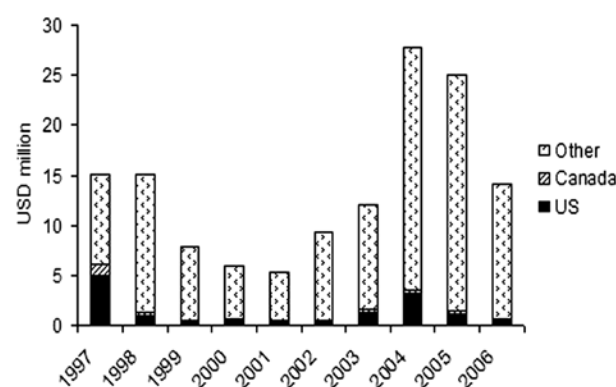
New Zealand's competitive advantage in Japan was

² Prefabricated houses are products included under 9406.00 in the harmonized trade classification system

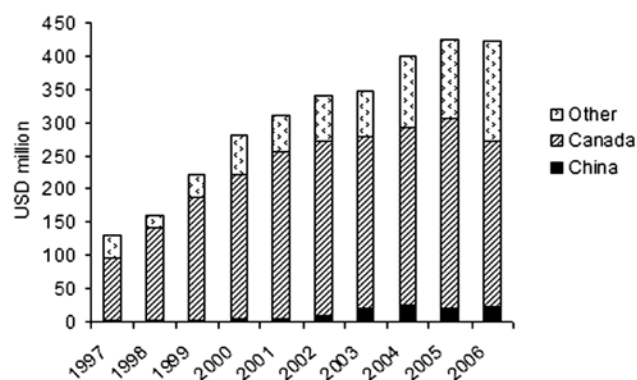
a) Japan



b) China



c) US



Figures 2a - 2c. Imports of prefabricated houses by market

based on a number of factors. High labour costs made Japan houses more expensive, and import duties were not significant. Shipping rates from New Zealand to Asia were also low due to a regular excess in the balance of trade in shipping containers. Exports continued after the crisis however the market became increasingly competitive.

China's rapidly developing economy and growing number of upper middle income earners has provided

an interesting, albeit longer term, opportunity for house exporters. There tended to be fewer constraints on land than many other Asian countries. Large housing estates have been developed to satisfy the demand of higher income people. Combined with this there has been growing demand for other low-rise buildings such as resorts, hotels, villas, clubs and recreational facilities.

Wood has not been significant in Chinese housing construction, and hence there were no regulations governing its use. Building companies could design to their own specifications. Where there were local requirements to be met, more often than not Chinese partners could influence local authorities to have these waived. This lack of recognition of wood as a building material in building codes also acted as a disincentive for consumers as they were unsure of the performance and acceptability of wood, especially for fast-grown plantation wood. Hence the market never developed beyond a few show homes in various parts of the country.

In 2004, in recognition of the potential for growth in wooden housing systems, a new building code for wood construction was introduced based largely on North American systems and standards. The New Zealand industry welcomed its introduction as it recognised radiata pine as suitable for house construction. The expectation was that the new code would pave the way for the development of a market for wood framed houses. To date few houses have been built as there was limited knowledge on wooden building methods. This created an opportunity for imports of prefabricated houses. By 2006 there was a limited response in imports mainly from Germany and Taiwan (Figure 2b). However New Zealand exports remained largely unaffected.

The US is deficient in wooden building materials and hence imports large quantities from Canada, Europe, Russia, and South America. High manufacturing and

building costs have also led to growing imports of finished products, including prefabricated houses.

Trade data shows that imports of prefabricated houses grew from USD 120 million in 1997 in to over USD 400 million in 2006 (Figure 2c). Most were imported from Canada but other sources have also grown. In particular there has been marked growth of imports from China, growing from USD 4 million in 2001 to USD 20 million in 2006. The US has also received the attention of New Zealand manufacturers as radiata pine had already been accepted in a variety of building applications. New Zealand exports grew from 2000 to 2004, but this trade has since declined.

Main stakeholders in prefabricated house exports

Prefabricated house exports are supported by an extensive supply chain. This includes sawmills, timber merchants, joinery manufacturers, which supply wooden doors, windows, and other components; and suppliers of other building products such as metal roofing, windows and insulation materials. Prefabricated house manufacturers export to developers and builders who sell to home buyers, institutions and property investors (Figure 3).

Methodology

Phone and face to face interviews were conducted with companies that had been involved in exporting to Japan, China and the US. These were identified from a list provided by New Zealand Trade and Enterprise and a search of the World Wide Web. This gave a list of fourteen companies, however it was found that five have closed and one was under different management. Another company declined to be interviewed. Interviews were completed with the remaining seven. New Zealand Trade and Enterprise staff in China, who had some involvement in the early

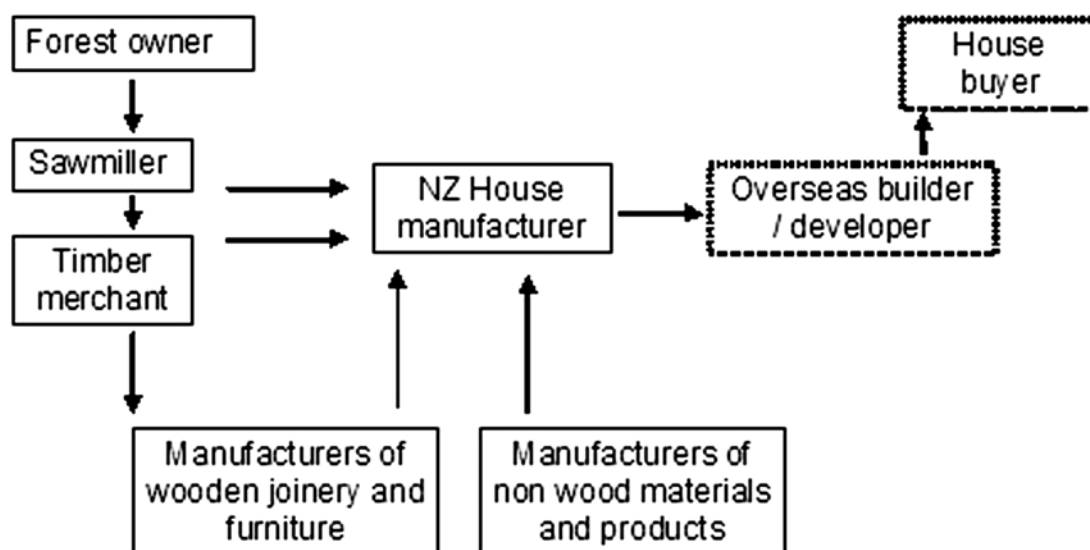


Figure 3 Stakeholders in exports of prefabricated houses

phase of market development, were also interviewed. The survey was conducted during September and October 2006 and followed a standard questionnaire.

All non-tariff trade measures were classified according to the classification system given in Maplesden, Turner and Walford (2004). The health and safety measures were those designed to protect local consumers from product deficiencies; environmental measures were those that aimed to meet national environmental goals, and social/political measures were those motivated to promote and protect domestic industries. The distinctions were sometimes ambiguous, for example measures specified for health and safety or environmental reasons could also be used to protect domestic industries against foreign competition.

Results

The companies that participated in this survey were small to medium-sized enterprises with an annual turnover between \$5 million to \$50 million. They were privately held, typically managed by an owner or family interests. Most companies managed exports as part of their overall business activities. One company managed exports as a separate business unit. Only one company dedicated itself solely to exports.

No company had experience in all three markets. Most had some experience with the Japanese market; a smaller number with China. Only one company had exported to the US.

Japan

Over the past ten years four of the companies surveyed had at some stage developed regular business in Japan. Another company failed to become established despite its best endeavour. All used Japanese building companies as business partners to help with market entry and dealing with local issues. However in spite of this, three of the four have since withdrawn from the market.

Three companies gave the cost of meeting high quality standards as a major deterrent to business in Japan, especially as it included parts of the service that did not affect product performance, such as packaging. Variations in local building regulations and procedures for gaining approvals were also cited as significant issues. Examples of this were proving that houses met energy standards, the requirement of allergy-free timber and paints, and the prohibition of glass as insulation material. Some companies felt that the regulations tended to be implemented on an *ad hoc* basis, with new ones added as compliance was met. One company found the logistics of meeting shipping schedules particularly challenging as it depended on the co-ordination and commitments of a large number of suppliers in New Zealand.

The year 2000 was a watershed for many New Zealand exporters. Deteriorating market conditions reduced demand for prefabricated houses. Small Japanese builders were facing increased competition from large domestic and foreign building companies. To remain competitive they raised quality requirements which led to increased claims and “cherry picking” New Zealand products by substituting components with lower cost alternatives. In one case all components and materials had been substituted with competing products. An example was also given where a partner became insolvent, incurring significant losses for the New Zealand exporter.

These factors made business challenging; however they did not make it impossible. But with a strengthening of the New Zealand market, most companies found that their limited resources were better employed developing domestic opportunities. Thus given stronger demand in New Zealand, unfavourable exchange rates, shortages in management resources and significant ongoing development costs, there was little interest in re-establishing exports to Japan.

Non-tariff Barriers

Socio political measures such as custom surcharges, taxes or licence fees, were not found to be significant. Also it was found that proprietary designs and technology could be adequately protected in Japan.

However some felt that there were unreasonable bureaucratic processes involved in the certification and approval process. The requirements and procedures varied from prefecture to prefecture. There was a feeling that these procedures were often designed to protect local interests rather than regulate industry.

New Zealand companies often faced difficulties in obtaining the information relating to the requirements for a particular area. This sometimes gave rise to significant consequences, as once houses had been shipped it became expensive and time consuming to make modifications.

Local bodies often acted independently and not always followed the codes specified by the Ministry of Construction. There were cases where building inspectors acted autonomously and made up rules based on their own interpretations of the code. Codes varied depending on local conditions. For example in mountainous areas houses had to withstand higher load factors on account of heavy snow falls, and in other areas there were requirements for buildings able to provide for greater earthquake resistance.

Building requirements were found easiest to meet on the island of Okinawa where foreign engineering certificates were accepted. They were most demanding in the major cities, especially Osaka and Tokyo.

There were two ways of gaining building compliance. An engineering certificate could be sought from an appropriate authority. This generally required a qualified local architect or engineer to confirm design values and submitting these to the local authorities. An engineering certificate allowed companies to use innovative building methods and designs, but it was a time consuming and costly process.

It was easier and less expensive to comply with the Japanese building code. Houses built in compliance were more readily accepted in the market. However the building code was found to be very prescriptive, such as specifying the height and diameter of handrails; the design and installation of staircases, and in kitchen design. This added to complexity and limited the opportunity for innovation and lower cost solutions in building design. Most companies felt that meeting New Zealand's high compliance requirements strengthened their ability to meet foreign requirements, especially as New Zealand building codes have also become more prescriptive.

Dealing with the bureaucracy and gaining the necessary approvals involved time and effort. It was generally felt that it added about 1% to the cost of the house. Most of the exported houses ranged in values from \$150 000 to \$180 000 (NZ Dollar, fob).

For a single house an engineering certificate added about 10% to 20% to costs. Large companies involved in big housing projects could spread this cost across a larger number of units. Unfortunately opportunities for large-scale development were few especially for the smaller Japanese builders that partnered New Zealand exporters.

There were major differences in complying with fire code regulations between New Zealand and Japan. The Japanese code's intent was to avoid fires from outside the building moving inside, whereas the New Zealand code was designed to stop internal fires moving out. The former had implications on sheathing, while the latter on interior wall linings. While the two objectives were not completely incompatible; the prescriptive nature of the codes required that they be accommodated differently. Complying with Japanese fire code added 3%-5% to costs. Requirements for higher load factors and earthquake resistance could add another 20%.

The Japanese building code required timber to be JAS certified. In New Zealand there were limited opportunities to source JAS certified timber. Other JAS certified products could not be sourced locally, such as specific types of exterior cladding, which had to be sourced in Japan at a higher cost.

Increased concern with sick building syndrome led in 2003 to an amendment of the Japanese Building Law restricting the amount of permissible formaldehyde emission. However one respondent felt that this law was inconsistent and favoured local suppliers as they were allowed to continue using isocyanides (API), which had

been banned in most countries including New Zealand.

Overall the respondents felt that health and safety requirements were not significant barriers to market access, as house design was market specific and costs involved in design modifications were compensated by a gain in house value. Some companies focused on areas where compliance with building regulations was easiest, while others found their competitive advantage in houses that met the most stringent specifications such as those in mountain areas.

While prefabricated houses sometimes had to be re-designed to comply with Japanese regulations; this required no additional investments in plant or labour.

The biggest cost involved in the Japanese market was the ongoing cost of market development, which included traveling and market education. This was important as specific market segments were less visible and difficult to identify due to language, culture and the sheer size of the market. One company estimated that market development cost about \$1 million over a 5 year period.

The major competitors were Canadian and to a lesser extent Scandinavian companies. Their main advantage was size and market recognition. Customers often preferred to deal with large companies. However while it improved their position in the market, exporters did not believe it advantaged them in dealing with non-tariff barriers.

China

Four companies built demonstration houses in China. Despite the apparent potential of the market, none of the companies managed to establish ongoing business.

The major reason for their lack of success was due to Chinese consumers not being convinced about the merits of wooden houses. This was despite houses designed to meet Chinese requirements, including using stucco exteriors to cater for the need for solidity and permanence.

Another issue was the difficulty in finding Chinese partners that were sufficiently reliable and trustworthy. The role of partners was to provide the labour force and obtain the required permits from local authorities. However Chinese builders were often found to be ill-suited lacking training and the necessary tools. There were risks of partners taking shortcuts thus affecting building performance. In one instance there was also deliberate obstruction from the Chinese builders, perhaps in an attempt to force the company to withdraw from the market.

One company felt that there were risks of the Chinese market growing too quickly and projects become too large to service for New Zealand companies. Their investment in developing the market would then be lost to larger competitors.

The companies interviewed had little knowledge of the new building code and how this may benefit their future prospects in China, despite the New Zealand forest industry and government's success in having radiata pine recognised as a building timber.

Non-tariff Barriers

Some companies reported that the main barrier to business in China was lack of intellectual property protection. They felt that they incurred significant risks of having their designs copied by other builders, even by their local partners. Some employed New Zealanders to oversee key parts of the project to ensure the intellectual property was protected. This was estimated to have added between 1% and 2% to the cost of the house. One company also reported extraordinary payments of so called custom fees, but the values involved were not large.

In the early stages of market development there were no major compliance issues as there were no regulations and standards for wooden houses. However one company reported having had to obtain local engineering certificates to certify that their houses were structurally sound.

As in Japan, the major competitors were from Canada and Scandinavia. Their main advantage was the higher recognition they gained due to their size. Following the introduction of the new building code they also benefited by not having to treat their timber, as was required for radiata pine. LOSP treatment was estimated to add about 1.5% to the cost of the house.

US

The US was recognised to be an easy market to enter. Despite the affluence of US consumers, the US construction sector is extremely competitive and most New Zealand prefabricated house exporters did not believe that they could sufficiently differentiate themselves to establish secure business. One company felt that the cost of certifying their designs to local US conditions and efforts required to gain market acceptance was too high. One company saw the greatest opportunities in the State of Hawaii. The attraction of Hawaii was that as it had to ship in most of its building materials, New Zealand suppliers could compete on a more even footing. New Zealand houses were reportedly well liked and accepted.

The cost of developing a market in Hawaii was found to be only a quarter of the cost of developing markets in places like Japan. Similarity in culture, customs and language was cited as a major factor in this, reducing communication costs, easier vetting of partners and a better match with consumer tastes and requirements.

Non-tariff Barriers

US building law is quite complicated, and under the jurisdiction of local authorities. Prefabricated houses would have had to be modified to meet the specific requirements for each region. The requirements in Hawaii however were found to be no more demanding than those in New Zealand.

Structural codes and standards were found to be prescriptive which did not always suit radiata pine. Alternatively the cost of obtaining engineering certification varied between \$200 000 to \$300 000 for each design, for houses valued approximately \$150,000 (fob). Clearly this cost was a major barrier to market entry for small companies with low volume exports.

The growing adoption of Green Building legislation by local authorities could potentially become an issue for exporters. Green Building rating systems frequently include credit for local materials. They also include credits for materials produced and manufactured within a 500 mile radius from the project site. Some localities have created incentive programmes for green building construction, including direct subsidies, density bonuses and expedited permitting (NY City Council, 2006).

Discussion

New Zealand prefabricated house manufacturers were faced with many challenges in developing markets in Japan, China and the US. Many of these were economic and market related, but there were also regulatory and bureaucratic measures to overcome. Some involved time and effort, while others incurred significant costs.

A summary of the NTMs identified in this survey is given in Table 1 together with their estimated costs, based on the respondents' own assessments. Because many of the costs were indirect or hidden, the costs in Table 1 are likely to be conservative. Examples of indirect costs are adapting designs to meet local building codes and regulations, having to use local certifiers, and having to source wood from JAS certified sawmills. Hidden costs include time taken away from existing business and constraints imposed by NTMs on manufacturing and design.

These results are based on the experiences of a small number of companies, each engaged in the market with their own unique product and service offering and in a limited range of geographical areas within each country. Thus the results are only indicative of the type of NTMs found in these markets.

The small sample size was due to the small number of companies that was identified to have exported and to be still in existence. The number of companies is not likely to have been large even at the peak of exports. Despite a potential for bias we believe the survey results still have

validity, and can be used as a basis to quantify the total impact of NTMs on New Zealand exports and in supporting trade negotiations.

Aside from dealing with NTMs, a significant hurdle for exporters was the expense of off-shore market development. The cost of travel, time taken away from existing markets and higher business risks, were high enough for firms to accept sub optimal market entry strategies at lower cost. For example the relationship with local partners was crucial for the future of their business however they often did not meet expectations. The New Zealand Government, through New Zealand Trade and Enterprise can play a role by assisting with the search and vetting of prospective partners.

The typical firm manufacturing prefabricated houses is a small to medium sized enterprise producing a semi customised product. To a large extent this customisation is driven by market requirements and by different codes and regulations, which have inhibited standardisation. Hence opportunities for industrialising manufacturing processes, which is necessary for achieving productivity improvements and economies of scale, have been limited.

The resources of most New Zealand enterprises were perhaps insufficient to maintain exports through long and difficult market entry periods and international economic cycles. A recurring theme was that improvements in domestic market conditions offered greater opportunities which led to a withdrawal from Japan and China even at the risk of future export markets.

NTMs were not found to be the major cause of a lack of success in the Japan, China or US markets. The greatest constraints came from limited resources, both human and capital, that made it difficult to sustain long term market development in a changing economic environment. This limitation is also seen in other New Zealand manufacturing industries and is a possible explanation why New Zealand firms are not as actively engaged in export markets as other developed countries. Perhaps to promote more added-value exports, policy makers need to re-look at existing policies and support programs to find new ways to encourage greater co-operation and resource sharing between companies in off-shore markets.

Acknowledgments

I would like to thank Frances Maplesden, formerly of Scion, for initiating and supporting this research. The encouragement and support from James Turner is gratefully acknowledged. The paper also benefited from referees' comments. The research was funded in part by the NZ Foundation for Research Science and Technology (contract C04X0305) and Scion. Finally my appreciation goes also to all the correspondents who willingly contributed to this project.

References

- APEC 1999. Study of Non Tariff Measures in the Forest Products Sector. New Zealand Forest Research Institute, Rotorua, New Zealand.
- Maplesden et al (2004). Tariff and Non-tariff Barriers to New Zealand's Exports of Wood-based Products to China. Report for the New Zealand's Forest Industry Council.
- MFAT 2007. Trade and Economic Relations. Web site accessed 10 October 2007. <http://www.mfat.govt.nz/Trade-and-Economic-Relations/NZ-and-the-WTO/Market-Access/index.php>
- WTA (2007). World Trade Atlas®. Global Trade Information Service, Inc. <http://www.gtis.com>
- WTO 2005. Non-tariff barriers. Building Codes and the Wood Products Sector. Some Suggested Negotiating Opportunities. World Trade Organisation TN/MA/W/48, 28 January 2005.