



Review of Import Tariffs beyond 2005

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Executive summary

This research was undertaken for the Ministry of Economic Development, which is co-ordinating the official review of post-2005 tariffs. The objective of the research is to recommend what should happen to import tariffs when the current freeze on further reductions ends in 2005. The recommended tariff regime beyond 2005 should be informed by the expected medium to long term benefits of one regime versus another and the transition costs associated with moving to a regime which is different from the current one.

The research has four main components:

1. An historical assessment of the effect of tariff changes on manufacturing industry employment, from the perspectives of region, ethnicity, gender, household type and income.
2. A postal survey of companies in industries which currently enjoy tariff protection, to establish the relative significance of tariffs to firms.
3. A series of case studies to better understand the micro-economic adjustments associated with tariff changes, both past and future.
4. General equilibrium modelling to analyse the macro-economic and industry effects of various tariff change scenarios.

These sections are preceded by an Overview discussion on where tariff changes sit within the context of broader economic reform, dealing with issues such as the capture of economic rents, reciprocation and dislocation costs.

Our main findings are summarised below.

Historical impact of tariff changes on industry

1. Past tariff reductions on clothing and footwear have led to noticeable changes in the relative share of these industries in total manufacturing, as measured by employment shares. This translates into observable effects by region, by ethnic group, by gender and by household type.
2. Beyond these industries, however, there is little evidence of a consistent relationship between tariff changes and changes in industry employment. It is likely that the effects of other economic events such as changes in monetary policy and the terms of trade have outweighed the effects of tariff changes.
3. Nevertheless the data suggests that a few communities might merit some assistance if tariffs are reduced quickly in future. This is because the consumer benefits of lower tariffs are much more widely dispersed than the industry dislocation effects.

Postal Survey

4. The results of the survey confirm the inferences drawn from the case studies in most instances. Most notably, tariffs are not amongst the most important issues for most companies. This is primarily true for companies which either are or have become less labour intensive, more export oriented, and more



innovative in terms of product development, sourcing of materials and production processes.

5. Nonetheless there are a few companies, mostly in the clothing and footwear industries, for whom tariffs provide a significant degree of protection to their margin.

Case Studies

6. A combination of lower tariffs, increased competition, high real interest rates, a floating exchange rate, changes in labour market conditions, and business failures has forced manufacturers to shift from a cost-plus (1980s) to a cost-down (1990s) business approach.
7. Of the 26 firms interviewed we would classify at least three firms as being subsistence businesses - they provide a cash surplus, they have some valuable assets on their balance sheets (mainly buildings), but they are vulnerable to imports eating away at what is left of their customer base.
8. There are around four or five firms that are indifferent to what happens to tariffs. Their businesses are financially sound and they have product that would continue to compete effectively with lower priced imports. Quality, customisation, speed, design, and a significant level of natural protection are important ingredients to the commercial robustness of these businesses.
9. The majority of firms occupy the middle ground on tariffs. They benefit from their existence but would survive or adapt to the introduction of lower tariffs.
10. The tariff freeze is generally regarded as a helpful pause in the steady squeeze on margins that firms have had to manage over the past decade or more. A number of firms made the point that a period of stability has been very valuable in allowing/ encouraging them to think longer term. The increased certainty has led some firms to undertake investment and expansion they probably would not otherwise have embarked on.

General Equilibrium Analysis

11. Moving from the current tariff regime to free trade generates only a small gain in welfare, as measured by changes in private consumption or gross domestic product (GDP). Thus it is reasonable to infer that partial reductions in tariffs would yield even smaller effects.
12. Even on the assumption that there would be some dynamic efficiency gains, the macroeconomic gains from free trade are unlikely to exceed 0.1% of GDP. That is, the level of GDP would permanently be higher by less than 0.1%.
13. The simple point is that New Zealand has secured most of the gains from lower import protection already; firstly by the removal of import licensing, secondly by bringing down the 'tall poppies' and thirdly by lowering the entire tariff profile to the point where the mean price of goods imports is about 1% higher than what it would be without tariffs. The additional gains from a possible fourth stage – free trade – are small by comparison, even allowing for some additional increase in variety and quality; attributes which are difficult to measure, but which increase the consumer gain from lower border protection.



14. The industries which would incur the greatest losses in output under free trade are clothing and footwear, with the reductions in output being about 8% in each case. Small gains accrue to industries such as forestry, dairy and meat processing, base metals, and machinery and equipment.

Recommendations

While the macroeconomic gains from further reductions in tariffs are likely to be small, considerations such as market signalling and rent seeking behaviour lead us to the view that all tariffs should eventually be abolished. Furthermore, the weight of evidence collected from industries demonstrates that few companies benefit significantly from tariff protection, while for many companies the tariff regime has an adverse effect on profitability, either by raising input costs or compliance costs. In addition, those companies for whom tariffs are important tend to be those with relatively poor productivity, with low foreign exchange earnings and with mediocre future viability.

Of course this is a generalisation; many would be viable without tariff protection if given enough time to adjust. A reasonable adjustment period would also minimise the economic losses associated with transition costs, although historical evidence suggests that these costs are unlikely to be substantial and would probably be unobservable within the usual year to year variation in economic growth, even in specific regions.

For these reasons we advocate a phased reduction of tariffs over the next 5-10 years:

1. After the current freeze ends, all tariffs should be progressively reduced to zero.
2. Before the freeze ends and preferably as soon as possible, the path of tariff reductions should be announced. A multi-party accord, although difficult, would add credibility to the policy, provide business certainty and would minimise the chances of more deferrals through industry lobbying against future reductions.
3. The path of tariff reductions should ensure that the cost of delays does not exceed the loss from accelerated depreciation of productive capital stock.
4. In addition, the process of reduction should begin by simplifying the tariff regime so that tariffs are expressed in multiples of 5%.
5. Given these criteria, we recommend the following path:
 - 2003: Announce future path of tariff reform.
 - Immediately post freeze: All tariffs drop to the next lowest multiple of 5%.
 - Thereafter: every two years tariffs drop by a further five percentage points until they reach zero. Given the current tariff structure, most tariffs would be zero by 2010, in line with the Bogor goals of 'free and open' trade and investment by 2010 for developed countries. (Developing countries have until 2020.) Most protected companies would have an adjustment period of at least seven years.



1 OVERVIEW OF TARIFFS

1.1 Background

The work commissioned by the Ministry of Economic Development and reported on below is based on four major areas of work.

1. An historical examination of the correlation between tariff changes and employment (by industry, region, ethnicity, gender, family type and family income). The intention here was to obtain some idea of the impact of tariff changes in the past vis a vis other economic reforms.
2. Continuing with this theme a postal survey of 400 companies in industries currently enjoying tariff protection was undertaken to establish the relative significance of tariffs to firms today. We achieved a response rate of 73.6% to the survey.
3. To gain a better appreciation of the micro-economic adjustments associated with tariff changes, both past and future, we undertook interviews with 26 firms to prepare a series of case studies.
4. General equilibrium modelling work was then undertaken to analyse the macro-economic and industry effects of various tariff change scenarios.

In addition Associate Professor John Madden of the Centre for Policy Studies (Monash University) in Australia was retained to peer review the work.

Before reporting on the above in detail we discuss tariff changes in the context of broader economic reform. This section concludes with our recommendations.

1.2 Theory of protection

Conceptually tariffs, or more generally import protection, have been justified for six main reasons:

1. Equalisation of cost differences
2. A relatively easy source of government revenue
3. Improvement in the terms of trade
4. Capture of economic rents
5. Promotion of industries with positive externalities
6. Reciprocation

1.2.1 Cost differences

A frequent argument for the imposition of tariffs, especially in developed economies, is that tariffs should be used to equalise costs between trading partners so that one country does not have an “unfair” advantage. This could pertain to labour costs, environmental standards, health and safety regulations or whatever. Of course this argument is completely counter to the well established theory of comparative advantage and totally undermines the potential gains from trade. Where there are fundamental issues of human rights (not just cheap labour), tariffs are a poor method of addressing the issue.



1.2.2 Ease of collection

Tariffs are a common means of collecting revenue in developing countries (where there might be an underdeveloped internal tax system). This is because goods which cross a border are easy to identify relative to income and domestic transactions. In developed economies this argument is much weaker as more formalised market systems have evolved for all manner of economic exchange – labour services, goods, financial transactions, property and so on. Thus the appeal of ease of collection is no longer relevant and certainly not a justification for tariffs in New Zealand.

1.2.3 Terms of trade

A tariff levied on an import will raise the cost of the good in the importing country. Consequently demand for the good will fall. This means that on world markets the good will be in excess supply, leading to a decline in the world price for that good. The incidence of the tariff is thereby divided between the producer and the consumer. With a lower world price the country which levied the tariff sees an increase in its terms of trade.

If the country which imposes the tariff is small, as New Zealand is, in relation to the total market for the relevant good, the change in the world price would be negligible and hence no terms of trade gain would be secured. There is, however, another route by which a rise in the terms of trade may occur. The tariff raises the cost of production, either directly by raising the cost of intermediate imported goods, or indirectly by enabling relatively high cost domestic producers to sell on the local market. Either way the costs of production rises. If a country has some price-setting power with respect to its exports, the terms of trade increase. Of course this raises the question of why exporters do not raise their price in the absence of a tariff. The response is that prior to the tariff exporters are producing at their profit maximising point, where marginal revenue equals marginal cost. The cost increase caused by the tariff forces them to shift to an inferior point – one characterised by a higher price and a lower quantity.

While the terms of trade may rise, there is a loss in allocative economic efficiency, as resources are attracted by the protected industries out of areas where they previously earned their marginal product. Thus there is a decline in economic welfare. This is the familiar Harberger triangle. It is an empirical question as to whether the negative effect on welfare from the loss in efficiency is outweighed by the positive effect of the rise in the terms of trade.

Note, however, that the question is entirely static. The loss in allocative efficiency may be represented as a downward intercept shift in the growth path of the economy. That is, if there were two identical economies, one with tariffs and one without, their growth rates would be identical, but the former would be permanently at a lower level.

Of potentially greater significance is the issue of whether tariffs inhibit dynamic efficiency. This is discussed in the section below on externalities as the same point arises in that context.

1.2.4 Capture of economic rents

As seen above, the presence of a tariff can lead to a decline in the terms of trade of the country on whose goods the tariff is imposed. More generally, consider the case where an exporting country is exploiting monopoly power on world markets by pricing above free market levels. If the importing country imposes a tariff some of the monopoly rent is transferred to the importing country. In fact some



exporters engage in a form of pricing known as 'pricing to market' whereby prices are set in relation to what the exporter perceives the target market will bear. Motor vehicle companies are often cited as examples of this practice. Under those circumstances the imposition of a tariff may lead to only a small price increase for the final consumer as the exporter lowers the c.i.f. price in order to maintain the original price to the consumer. The tariff then means that the rent formerly captured by the exporting country is largely appropriated by the importing country.

1.2.5 Promotion of positive externalities

Border protection is frequently justified by the argument that the support of a particular set of domestic industries will generate favourable spill-over effects in the form of labour skills, critical mass, technology, ability for other industries to compete internationally without (explicit) support, etc. National security and the 'infant industry' argument are variations of this rationale. The support of Airbus Industrie by the European Union is probably the foremost example of justifying protection by citing favourable externalities. And many of Japan's leading companies have benefited from protection, albeit in forms other than import tariffs.

The problem with the infant industry argument is that it is not clear when the industry is no longer an infant. When should protection be removed? When do the dynamic efficiency gains offset the short term losses in allocative efficiency? Even if the term of protection is clearly spelled out in advance, intense lobbying by industry as the expiry date approaches is typical. Furthermore, new arguments for continued protection arise – the need for plant upgrades, 'temporary' relief against dumping by foreign competitors, retention of jobs in marginal electorates and so on. One only has to look at the US steel industry to see how successful an industry can be at winning on-going protection since at least the 1960s.

In fact, not only is the US steel industry a good example of a case where protection once granted, is difficult to withdraw; it is also a good example of why protection does not work. The industry is an oligopoly where competition is weak and would be weaker still without imports. It is inefficient by world standards and has manifestly not used the opportunity provided by protection from imports to improve productivity. The argument that the loss from tariffs in the short term is worth the longer term gain is tenuous. As tariffs inhibit competition their effect on innovation and efficiency is more likely to be negative than positive. Not only is the growth path of the economy lower, its growth rate is lower too. That is, tariffs generate losses in both allocative efficiency and dynamic efficiency.

Even where positive externalities are a defensible proposition (and we should not deny this possibility outright), a direct subsidy is a more efficient means of providing assistance than a tariff. Other mechanisms such as assistance with research and access to technical expertise are also preferable to tariffs.

1.2.6 Reciprocation

They do it to us so we should do it to them is another oft-cited reason for imposing import tariffs. Given the argument above that tariffs are welfare-reducing, this makes as much sense as saying that because another country wishes to reduce the welfare of its citizens, we should do the same. Nevertheless there is one set of circumstances where this defence of tariffs may



have some merit. Consider two countries each with tariffs on imports from the other. Country A would benefit from lowering its tariffs even if country B left theirs in place. Country B might adopt the position, however, that it would reduce its tariffs if country A did likewise. If country A has already reduced its tariffs it cannot meet country B's condition. Thus although country A will still be better off than if it had retained its tariffs, it would not be as well off as it would be under mutually free trade.

From a negotiating position then, it may be better to incur the loss imposed by a tariff in the short term if eventually it can enjoy free trade. Empirically the question that country A needs answered is whether the discounted gains from the first scenario (unilateral abolition of tariffs) are outweighed by the discounted gains from the second scenario (tariffs retained for a period followed by free trade).

While in theory the latter could be the preferred alternative, it should be noted that it relies on a number of political judgements in country A; namely that country B does not see the benefits of unilateral tariff reduction and that there is a real prospect that country B would only reduce its tariffs on the condition that country A reciprocates. One would not a priori give much credence to such a scenario, but the predominance of bilateral free trade (or freer trade) arrangements suggests that these scenarios are common. As noted by Helpman and Krugman (1989):

*"The case for free trade has always rested on an argument that it represents a good rule of thumb given uncertainty about alternatives, realistic appreciation of the difficulties of managing political interventions, and indeed the need to avoid trade wars."*¹

1.3 International Developments

As noted in the previous section, bilateral and regional free trade deals are commonplace. Similarly there are many regional trading blocs with zero or low tariffs amongst members. Examples are, NAFTA, the European Community, Mercosur (between countries in South America), the ASEAN free trade area, and APEC.

These developments coupled with continual, albeit slow reductions in border protection under GATT (now WTO), point clearly to declining protection as a world-wide phenomenon, albeit that regional trade blocs can divert trade as well as create trade. Tariffs and quota on manufactured goods are the predominant subjects of this phenomenon, with agricultural commodities and services still subject to many different types of trade barriers in many countries. Examples are the EC's Common Agricultural Policy and widespread restrictions on the operations of international airlines. The Multi-fibre Agreement (ostensibly to be phased out on 1 January 2005) is another arrangement which has substantial negative trade and welfare impacts, especially for developing countries.

Nevertheless the international trend has been to reduce border protection.² Where protection remains it is not because of some clear economic argument in

¹ Helpman, E. and P.R. Krugman (1989), *Trade Policy and Market Structure*, MIT Press Cambridge Massachusetts, p186.

² For some data on trends in tariffs see Productivity Commission 2000, *Review of Australia's General Tariff Arrangements*, Report No 12, AusInfo, Canberra, p79.



its favour – political factors are the impediment to progress. It is rare though for countries to increase protection, although there are some high profile counter-examples; USA tariffs on steel and lamb (temporary). Indeed for countries which subscribe to GATT there are few instances where increased border protection is permitted. New Zealand's recently imposed anti-dumping duty on whiteware from South Korea is an example.

Overall then any general move to increase tariffs (beyond the bound rates) would be both in breach of GATT and run counter to current international trends, thereby risking the prospect of retaliatory action and increasing the loss in aggregate welfare.

1.4 The role of tariffs in transforming the economy

The decline in tariffs over the past 15 years has been an important factor in transforming many industries and businesses. Lower rates of protection have compelled companies to make step, rather than incremental, changes in:

- cutting costs to remain competitive
- narrowing the range of goods produced, though increasing the range of goods sold (using imports)
- developing export products and markets

In most cases the changes have been transformational. Firms have shifted from being manufacturers to marketers, managers of production lines to managing supply chains, from purely local players to being largely focused on export sales, and from a cost-plus to cost-down suppliers.

A number of firms interviewed as part of this study pointed out that initially they made incremental changes to their business such as reducing their labour force, squeezing suppliers for lower cost inputs and narrowing the product range manufactured. But as the extent of the required changes became apparent firms embarked on more radical restructuring – outsourcing production, developing export markets, investing in retailing.

The clothing industry probably best exemplifies the degree of change that companies have undergone as the pressure from declining tariff protection and increased imports has remained intense. For some companies employment has fallen by 80% over the past ten years as the business has been restructured. Hours worked in the TCF sector fell by around 57% between 1986 and 2001.

Although tariff reductions have not been the only force for change in manufacturing businesses, they have certainly been amongst the most potent in industries such as car assembly, clothing and footwear, and plastics.

Tariff reductions have not only changed the way many businesses have operated, they have also led to major changes in consumer markets. The fall in consumer prices for a whole range of consumer goods subject to tariffs has boosted real disposable incomes. The New Zealand Institute of Economic Research has estimated that tariff reductions between 1987 and 1998 raised



average household spending power by \$22 per week (1998 prices) compared to a no-change scenario.³

1.5 Tariffs – a low business priority

How important are tariffs for firms? Interviews with individual firms as part of the case study work as well as the mail survey probed this question. The outcome was that tariffs generally come well down the list of management concerns.

In some cases tariffs were so unimportant that managers were unaware the company still enjoyed tariff protection. The mail survey results show tariffs on competing imports were of less concern than (in no particular order):

- the company tax rate
- access to labour and skilled staff
- the level of interest rates
- developing brands
- having a wide range of products to sell
- having the latest plant and equipment

From the case study work we would add exchange rate movements to the above list.

For many manufacturers tariffs are irrelevant either because they do not exist for their products or the rate is so low as to be meaningless. But for the economy as a whole tariffs raise the price of manufactured goods (excluding petrol) by only about 1%. To put this in context the currency gyrates on average by about 2% from one month to the next.

Tariffs are likely to become more important to businesses when changes are being made to tariff rates. Firms' primary concerns at that point are likely to be that any changes are well-signalled, that they allow reasonable time for adjustment and result in some simplification/consolidation of the regime.

1.6 Why change tariffs?

From the background work associated with this tariff review it is clear that tariffs are sufficiently low to no longer be a major factor (positive or negative) in determining economic or business performance. Sections 3 and 4 discuss this position. In addition, the gains and losses from reducing tariffs further are generally within the margin of error from a macroeconomic point of view (see Section 5) and the mail survey and case studies suggest that firms, on the whole, are resigned to tariffs being reduced further. Just as lowering tariffs would cause an economic ripple rather than a shock wave, so, leaving the current tariff freeze in place has few economic costs.

In this section we look at arguments for reducing tariffs from two important angles: signals to business and good economic management.

³ Consumer benefits from import liberalisation: A New Zealand Case Study; New Zealand Institute of Economic Research, for Ministry of Foreign Affairs and Trade; June 1999.



1.6.1 A signal to business

Prices are probably the most crucial signal for businesses. Prices dictate long-term investment and sourcing decisions as well as short-term decisions relating to production, stock levels and employment. Tariffs directly affect market prices and are therefore a crucial factor in business planning.

Tariffs create at least two potential problems for businesses:

- They distort prices and therefore investment decisions
- They create uncertainty - when and by how much will the Government change tariffs?

So long as tariffs remain in place they distort prices in favour of those domestically produced goods that attract a tariff. This distortion leads to a misallocation of labour and capital at the margin.

The distortionary effect is probably most significant where some companies in an industry are capable of surviving without a tariff while others are not. In this study we have interviewed firms that have either been unaware that tariff protection still exists for their products or who run their business as if tariffs did not exist. In the same industry there are firms that rely on tariffs to ensure their products remain competitive in the local market, and that they remain in business.

The problem here is that as the more competitive firms expand they need more labour. Tariff protection makes it more difficult for successful firms to bid labour away from less successful firms and therefore the economy ends up with a sub-optimal allocation of labour. Although this problem has traditionally been seen as an inter-industry one, the current study points to it becoming more common within industries.

A lack of direction in tariff policy is a source of uncertainty for businesses for two reasons. They directly affect market prices and they are determined by the government rather than market forces. Hence the strong case for signalling tariff changes well in advance so that firms and markets can plan for the consequences of price changes.

As the car industry has found, however, markets tend to change behaviour well in advance of tariff changes being implemented. That leads to confusion and uncertainty as some industry players press for an early reduction in tariffs to formalise how the market is working and if there is a prospect of an early decision then it has significant implications for importers' stock management policies.

In summary, tariffs are an artificial influence on prices, which are a crucial signal for businesses. The less distortion there is in prices the better firms will be at allocating scarce resources. Tariffs are an easily identifiable source of change for businesses, but the Government rather than market pressures determine what changes will occur. Although the Government can minimise the uncertainty inherent in tariff changes they cannot eliminate it altogether.

The closer tariffs get to zero the smaller these issues for business become. And while many companies consulted as part of this study acknowledged that tariffs were now close to a non-issue for them, so long as they exist they remain a potential disturbance.



1.6.2 Economic management

The Government's growth and innovation strategy includes a goal of raising New Zealand per capita incomes to the top half of the OECD. That implies a marked acceleration in New Zealand's rate of economic growth. A key aspect of pursuing the growth goal is better utilisation of the country's resources – labour and capital.

Over the ten years to March 2002 employment increased on average by 2.3%pa. From recent work undertaken for Industry New Zealand⁴ Infometrics estimated that employment would need to rise by around 2.5%pa if the economy was to generate per capita incomes around the average of the OECD by 2010.

The problem, though, is that the pool of available labour in terms of currently unemployed people, working age people willing to put themselves up for work (the participation rate) and simply the growth in the working age population are all less accommodating for employment growth now than they have been.

Over the past few years the economy has been operating far closer to full capacity (potential) than for most of the 1990s. Anecdotal evidence of labour shortages highlights the tightness of the labour market. In these conditions the efficient allocation of labour becomes increasingly important.

In the interests of good economic management there should be as few impediments as possible to labour flowing to the areas of highest return. Tariffs are an obvious impediment, and are also a direct responsibility of government.

Another aspect of economic management that is relevant to the question of whether or not to reduce tariffs is expectations. Business expectations influence the decisions companies make. Over the ten years to 1999 businesses had become conditioned to thinking that tariffs would continue to fall and eventually be eliminated. Most businesses worked on that premise.

From the case study interviews it was clear that the tariff freeze was widely appreciated. But few companies (from the case study interviews) saw the freeze as other than a temporary halt to the inevitable decline in tariffs. In other words businesses, even those likely to suffer, generally expect tariffs to decline beyond 2005. Extending the freeze would undermine that expectation and might eventually encourage firms to resist any further tariff reductions.

1.7 Dislocation and transition costs

Section 1.1 discussed the common defences of protection and the weak foundation on which they are based. Although not an argument against tariffs in principle, the costs of adjustment are often cited as a reason to delay tariff reform. Particularly in the context of the two key findings of this report, notably:

- that the macroeconomic gains from greater allocative efficiency, from moving to zero tariffs are very small (at least if possible dynamic efficiency effects are ignored, and
- that many businesses consider them to be an insignificant issue,
 - one may well ask whether the dislocation and transitions incurred by the few industries (or firms) which would be affected are worth the gain. The arguments in the preceding sections establish the case for lower tariffs for reasons other

⁴ Strategy Scenario Tool, Industry New Zealand, September 2002.



than a gain in allocative efficiency, but even ignoring these, are the adjustment and transaction costs significant?

Ideally, econometric research could be used to isolate the effects of past changes in tariffs on changes in industry output and employment – preferably with the latter also disaggregated by other dimensions such as region, gender and ethnicity.

Such an exercise was beyond the ambit of this study. Instead we have looked at correlations between past changes in tariffs and changes in employment by industry, region, gender and ethnicity. Census data was used for this exercise covering the years 1986, 1991, 1996 and 2001. Section 2 discusses the results in detail, but the general finding is that changes in industry employment are not correlated with changes in tariffs. Of course this can mean that there truly is no significant relationship, or that other events have made any relationship unobservable (without econometric research). In the latter case it would mean that the effect of tariff changes on employment are small relative to effects of other events such as changes in employment law, movements in exchange rates and international commodity prices, droughts, and so on.

Whilst correlation between tariff changes and employment is low, industries which experienced the largest tariff reductions also showed large employment reductions – but not all industries which showed large employment losses experienced large tariff reductions. The three main examples where there was a correlation are footwear, clothing and transport equipment.

On a regional basis, employment losses over the period 1986 to 2001 were primarily in Territorial Local Authorities located in Auckland and the lower North Island. In the former group the losses were largely outweighed by expansion by other industries (precisely what tariff reform should accomplish). The latter group seems to have suffered a permanent decline in employment, but again this is not necessarily primarily attributable to tariff reductions.

Focusing on ethnicity, it is clear that Maori, Pacific Islanders and Asians were more affected by the decline in manufacturing employment than Europeans (mostly clothing and footwear). Again though, correlation with tariff changes is weak. The economic slowdown in the early 1990s may have been partly influenced by tariff reductions, but other factors were more important (restructuring the meat and dairy processing industries).

In addition, the question of who benefits most from lower consumer prices as a result of lower protection, particularly with respect to clothing and footwear, should also be examined before one judges whether one ethnic group would be more negatively affected by tariff reductions than another ethnic group.

Looking at employment by family type, it is sole parents with children who were most affected by the relative decline in manufacturing. However, their rate of employment in other industries rose strongly and more than offset the decline in manufacturing. Within manufacturing the largest fall by far in the share of hours worked was experienced by couples aged less than 65, with children.

In terms of family income decile, families in the second decile were most affected by the decline in manufacturing employment, followed by the third and tenth deciles. The sixth decile showed a relative gain. As before there is no consistent relationship to past changes in tariffs.



Finally, with regard to gender, again there is no clear relationship between tariff changes and changes in the gender composition of employment. As mentioned before though, industries which experienced the largest falls in tariffs (clothing and footwear) did also experience the largest falls in employment – they are also those industries with a high concentration of female employment.

Overall then, we infer that while future reductions in tariffs may generate some adjustment and dislocation costs, especially amongst women, Maori, Pacific Islanders and perhaps in certain regions, the size of such costs would probably be small in relation to the effects of other economic forces, particularly at a time of strong economic growth and a low rate of unemployment. As noted previously, where adjustment costs do need to be addressed by government, there are better means of doing so than by maintaining tariffs on imports.

1.8 Recommendations

Balancing all of the empirical, strategic and theoretical considerations for and against reducing tariffs tips the scales in favour of further reductions.

Nevertheless there are two conditions which should be noted. Firstly, there may industry-dependent communities which require some form of assistance to help them adjust to the closure or contraction of local employers who depend on tariff protection. Secondly, it is important that businesses have enough time to adjust to the announcement of a lower tariff regime so that investment decisions are not distorted and so that existing capital stock is not prematurely junked. Hence our recommendations are as follows:

1. After the current freeze ends, all tariffs should be progressively reduced to zero.
2. Before the freeze ends and preferably as soon as possible, the path of tariff reductions should be announced. A multi-party accord would add credibility to the policy and would minimise the chances of more deferrals through industry lobbying against future reductions.
3. The path of tariff reductions should provide a balance between the cost of delays and the accelerated depreciation of productive capital stock.
4. In addition, the process of reduction should begin by simplifying the tariff regime so that tariffs are expressed in multiples of 5%.
5. Given these criteria, the following path is suggested:
 - 2003: Announce future path of tariff reform.
 - Immediately post freeze: All tariffs drop to the next lowest multiple of 5%.
 - Thereafter: every two years tariffs drop by a further five percentage points until they reach zero.

This means for example that a tariff which is currently set at 19% would fall to 15% on expiry of the freeze. In 2008 it would fall to 10%, in 2010 to 5% and in 2012 to zero.

Given the current tariff structure, most tariffs would be zero by 2010, in line with the Bogor goals of 'free and open' trade and investment by 2010 for developed countries. (Developing countries have until 2020.) Most protected companies would have an adjustment period of at least seven years.



2 ANALYSIS OF 1986-2001 CENSUS EMPLOYMENT DATA MANUFACTURING INDUSTRIES AND TOTAL

We begin the review of tariffs beyond 2005 by looking at the effects of tariff changes in the past. An econometric approach would be the ideal way to do this, but is beyond the ambit of the project. Instead we use data from the four most recent censuses to establish whether there is any correlation between tariff changes and changes in employment – by industry, regional, ethnicity and gender.

2.1 Data

The tables and figures in this document have been derived from 1986, 1991, 1996 and 2001 Census data on hours worked in manufacturing industries. The data provided details on the number of workers in each manufacturing industry according to the number of hours per week that they worked. This was grouped into 1-4, 5-9, 10-14, 15-19 ... etc up to 70-74, with a final 75+ group. This data was translated into the number of hours worked by assuming the mid-point in each group represents the average number of hours worked per week for that group. Those in the final 75+ group were assumed to average 79 hours per week. Data on hours worked in each Territorial Local Authority (TLA) area in each manufacturing industry was provided. In addition, data on hours worked by ethnicity in each manufacturing industry was provided.

2.1.1 Industry classification

For 1986 and 1991 data was provided for the NZSIC major division 3 category at the 3-digit level. 1996 and 2001 data was provided for the ANZSIC division C category, also at the 3-digit level. The correspondence between the two classifications appears in *Table 2.1*. Note that this correspondence is by no means exact - but is, in our judgement, robust enough for the practical purposes of this investigation.

However, note that, where at all practical, the finer ANZSIC classification was used in intermediate calculations - thus the following correspondence was only applied to provide a full 1986 to 2001 comparison.

2.1.2 Tariffs

For 1991, 1996 and 2001 tariff rates were calculated using Statistics NZ trade data on duty paid and VFD total imports by ANZSIC category.

For 1986 tariff rates were inferred from 1986/87 input-output data, but at a more aggregated industry level. The matching of 1986 rates to the finer categories is relatively imprecise and so results should be interpreted with care. Note also that the implied 1986 data for tobacco and petroleum led to what we considered to be 'rogue' changes between 1986 and 1991 and so was not used.



Industry classifications

| 1986 & 1991 (NZSIC major division 3) | 1996 & 2001 (ANZSIC Division C) |
|---|---|
| 311 Food Manufacturing | C211 Meat and Meat Product Manufacturing C212 Dairy Product Manufacturing C213 Fruit and Vegetable Processing C214 Oil and Fat Manufacturing C215 Flour Mill and Cereal Food Manufacturing C216 Bakery Product Manufacturing |
| 312 Food Manufacturing | C217 Other Food Manufacturing |
| 313 Beverage Industries | C218 Beverage and Malt Manufacturing |
| 314 Tobacco Manufacturers | C219 Tobacco Product Manufacturing |
| 321 Manufacture of Textiles | C221 Textile Fibre, Yarn and Woven Fabric Mfg C222 Textile Product Manufacturing C223 Knitting Mills |
| 322 Manufacture of Clothing Except Footwear | C224 Clothing Manufacturing |
| 324 Manufacture of Footwear Except Vulcanised or Moulded Rubber or Plastic and Wooden Footwear | C225 Footwear Manufacturing |
| 323 Manufacture of Leather and Products of Leather, Leather Substitutes and Fur, Except Footwear & Clothing | C226 Leather and Leather Product Manufacturing |
| 331 Manufacture of Wood, and Wood and Cork Products Except Furniture | C231 Log Sawmilling and Timber Dressing C232 Other Wood Product Manufacturing |
| 341 Manufacture of Paper and Paper Products | C233 Paper and Paper Product Manufacturing |
| 342 Printing, Publishing and Allied Industries | C241 Printing and Services to Printing C242 Publishing C243 Recorded Media Manufacturing and Publishing |
| 353 Petroleum Refineries | C251 Petroleum Refining |
| 354 Manufacture of Miscellaneous Products of Petroleum and Coal | C252 Petroleum and Coal Product Manufacturing nec |
| 351 Manufacture of Industrial Chemicals | C253 Basic Chemical Manufacturing |
| 352 Manufacture of Other Chemical Products | C254 Other Chemical Product Manufacturing |
| 355 Manufacture of Rubber Products | C255 Rubber Product Manufacturing |
| 356 Manufacture of Plastic Products nec | C256 Plastic Product Manufacturing |
| 362 Manufacture of Glass and Glass Products | C261 Glass and Glass Product Manufacturing |
| 361 Manufacture of Pottery, China and Earthenware | C262 Ceramic Manufacturing |
| 369 Manufacture of Other Non-Metallic Mineral Products | C263 Cement, Lime, Plaster and Concrete Product Mfg C264 Non-Metallic Mineral Product Manufacturing nec |
| 371 Iron and Steel Basic Industries | C271 Iron and Steel Manufacturing |
| 372 Non-Ferrous Metal Basic Industries | C272 Basic Non-Ferrous Metal Manufacturing C273 Non-Ferrous Basic Metal Product Manufacturing |
| 381 Manufacture of Fabricated Metal Products, Except Machinery and Equipment | C274 Structural Metal Product Manufacturing C275 Sheet Metal Product Manufacturing C276 Fabricated Metal Product Manufacturing |
| 384 Manufacture of Transport Equipment | C281 Motor Vehicle and Part Manufacturing C282 Other Transport Equipment Manufacturing |
| 385 Manufacture of Professional and Scientific, and Measuring and Controlling Equipment nec and of Photographic and Optical Goods | C283 Photographic and Scientific Equipment Manufacturing |
| 383 Manufacture of Electrical Machinery Apparatus, Appliances and | C284 Electronic Equipment Manufacturing C285 Electrical Equipment and Appliance mfg |
| 382 Manufacture of Machinery Except Electrical | C286 Industrial Machinery and Equipment mfg C291 Prefabricated Building Manufacturing |
| 332 Manufacture of Furniture and Fixtures Except Primarily of Metal | C292 Furniture Manufacturing |
| 390 Other Manufacturing Industries | C294 Other Manufacturing |

Table 2.1



2.2 Manufacturing employment by industry

Hours worked in manufacturing declined substantially between 1986 and 1991, with a fall of over 25%. Since 1991 manufacturing hours have stabilised - having risen by a marginal 1.9% between 1991 and 1996, but retreated by 3.7% over the 1996 to 2001 period.

The greatest reductions (in % terms) were recorded in industrial and other chemicals, followed by footwear (industries 351, 352, 324) - all with declines of over 80%. However, the changes for industries 351 and 352 are likely to be primarily attributable to changes in classification, given the opposite change in industry 353 and 354. The next largest changes were in tobacco, clothing, rubber, glass and paper (industries 314, 322, 355, 362, 341), all recording declines of between 50% and 80%. Making up this 'top ten' were transport equipment and textiles (categories 384 and 321) with reductions of the order of 45%.

Weekly hours worked in manufacturing

| NZSIC industry | Hours worked | | | |
|--|----------------|---------------|----------------|---------------|
| | 1986 | 1991 | 1996 | 2001 |
| 311 Food manufacturing | 2736.3 | 2259.4 | 1650.1 | 1684.2 |
| 312 Food manufacturing | 156.1 | 167.7 | 473.3 | 490.9 |
| 313 Beverages | 171.0 | 139.9 | 145.6 | 178.2 |
| 314 Tobacco | 37.4 | 23.5 | 18.1 | 11.0 |
| 321 Textiles | 662.1 | 413.4 | 417.5 | 367.4 |
| 322 Clothing (ex footwear) | 866.5 | 583.2 | 477.0 | 334.7 |
| 323 Leather, Products, Substitues & Fur (ex ftwr & clthg) | 140.7 | 104.4 | 123.3 | 123.3 |
| 324 Footwear | 175.6 | 79.8 | 58.7 | 29.1 |
| 331 Wood and wood products | 810.8 | 647.2 | 740.7 | 796.5 |
| 332 Furniture and Fixtures | 371.4 | 305.4 | 416.7 | 408.6 |
| 341 Paper and paper products | 587.0 | 410.2 | 341.4 | 272.2 |
| 342 Printing, Publishing and Allied Industries | 905.1 | 782.6 | 910.3 | 864.6 |
| 351 Industrial Chemicals | 240.9 | 180.3 | 29.0 | 8.6 |
| 352 Other Chemical Products | 319.8 | 208.8 | 20.9 | 12.5 |
| 353 Petroleum Refineries | 87.7 | 43.8 | 170.8 | 170.4 |
| 354 Miscellaneous Products of Petroleum and Coal | 22.1 | 13.1 | 245.2 | 207.2 |
| 355 Rubber Products | 161.7 | 90.0 | 73.2 | 63.6 |
| 356 Plastic Products nec | 328.1 | 283.9 | 327.2 | 333.6 |
| 361 Pottery, China and Earthenware | 67.6 | 37.2 | 56.6 | 41.0 |
| 362 Glass and Glass Products | 116.1 | 67.0 | 50.8 | 47.8 |
| 369 Other Non-Metallic Mineral Products | 294.7 | 183.4 | 173.8 | 191.6 |
| 371 Iron and Steel Basic Industries | 198.5 | 161.6 | 144.2 | 122.1 |
| 372 Non-Ferrous Basic Metal Industries | 142.6 | 140.2 | 132.5 | 126.7 |
| 381 Fabricated Metal Products (ex machy and eqpmt) | 1203.0 | 821.7 | 883.3 | 891.3 |
| 382 Machinery (ex electrical) | 925.8 | 703.4 | 780.5 | 760.9 |
| 383 Electrical Machinery | 657.3 | 401.6 | 482.1 | 476.4 |
| 384 Transport Equipment | 888.5 | 491.0 | 563.3 | 484.9 |
| 385 Prof, Scientific, Measuring eqpmt nec; Photo & Optical | 61.1 | 26.1 | 56.0 | 76.6 |
| 390 Other Manufacturing Industries | 204.5 | 209.1 | 204.3 | 216.1 |
| ALL MANUFACTURING | 13540.1 | 9979.1 | 10166.3 | 9792.2 |

Table 2.2



Of these 'top ten' three have experienced 'double-digit' %-point reductions in tariff rates over this period - namely footwear, transport equipment and clothing ex footwear (tariff rates down by 46.5, 23.8 and 19.8 %-points, respectively).

Note: In the table below the tariff rate are calculated as tariff revenue divided by the value of imports. Hence they may not reveal where the highest rates are.

Manufacturing Tariffs Estimated 1986-2001 (%)

| NZSIC industry | 1986 | 1991 | 1996 | 2001 |
|--|-------------|-------------|-------------|-------------|
| 311 Food manufacturing | 2.3 | 1.4 | 0.8 | 0.5 |
| 312 Food manufacturing | 2.6 | 1.6 | 1.4 | 0.9 |
| 313 Beverages | 78.0 | 48.0 | 40.3 | 36.6 |
| 314 Tobacco ¹ | 287.1 | 287.1 | 237.3 | 389.0 |
| 321 Textiles | 6.3 | 2.9 | 3.5 | 3.3 |
| 322 Clothing (ex footwear) | 33.6 | 15.3 | 19.5 | 13.8 |
| 323 Leather, Products, Substitues & Fur (ex ftwr & clthg) | 19.0 | 8.7 | 5.2 | 2.4 |
| 324 Footwear | 60.5 | 27.5 | 20.1 | 13.9 |
| 331 Wood and wood products | 5.9 | 2.3 | 1.8 | 0.7 |
| 332 Furniture and Fixtures | 26.6 | 10.5 | 6.5 | 4.0 |
| 341 Paper and paper products | 7.7 | 2.6 | 1.3 | 0.5 |
| 342 Printing, Publishing and Allied Industries | 1.8 | 0.6 | 0.4 | 0.2 |
| 351 Industrial Chemicals | 0.1 | 0.1 | 0.0 | 0.0 |
| 352 Other Chemical Products | 1.9 | 1.5 | 1.1 | 0.6 |
| 353 Petroleum Refineries ¹ | 53.5 | 53.5 | 61.1 | 49.9 |
| 354 Miscellaneous Products of Petroleum and Coal | 0.1 | 0.1 | 0.2 | 0.0 |
| 355 Rubber Products | 6.3 | 5.0 | 3.9 | 2.9 |
| 356 Plastic Products nec | 4.3 | 3.4 | 2.1 | 1.2 |
| 361 Pottery, China and Earthenware | 12.5 | 6.8 | 3.7 | 1.8 |
| 362 Glass and Glass Products | 1.7 | 0.9 | 0.4 | 0.5 |
| 369 Other Non-Metallic Mineral Products | 3.9 | 2.2 | 1.9 | 0.8 |
| 371 Iron and Steel Basic Industries | 3.8 | 0.6 | 0.9 | 0.4 |
| 372 Non-Ferrous Basic Metal Industries | 3.9 | 0.2 | 0.2 | 0.1 |
| 381 Fabricated Metal Products (ex machy and eqpmt) | 8.8 | 2.1 | 1.4 | 0.8 |
| 382 Machinery (ex electrical) | 4.3 | 1.0 | 0.5 | 0.2 |
| 383 Electrical Machinery | 6.6 | 1.6 | 0.8 | 0.2 |
| 384 Transport Equipment | 24.0 | 5.7 | 5.7 | 0.2 |
| 385 Prof, Scientific, Measuring eqpmt nec; Photo & Optical | 1.8 | 0.4 | 0.4 | 0.0 |
| 390 Other Manufacturing Industries | 12.4 | 7.0 | 2.4 | 1.1 |
| ALL MANUFACTURING | 6.9 | 4.2 | 4.3 | 3.5 |

¹ 1986 tariff data unreliable so assumed same as 1991. Includes excise duties.

Table 2.3



Change in Hours Worked and Tariff by Industry 1986-2001

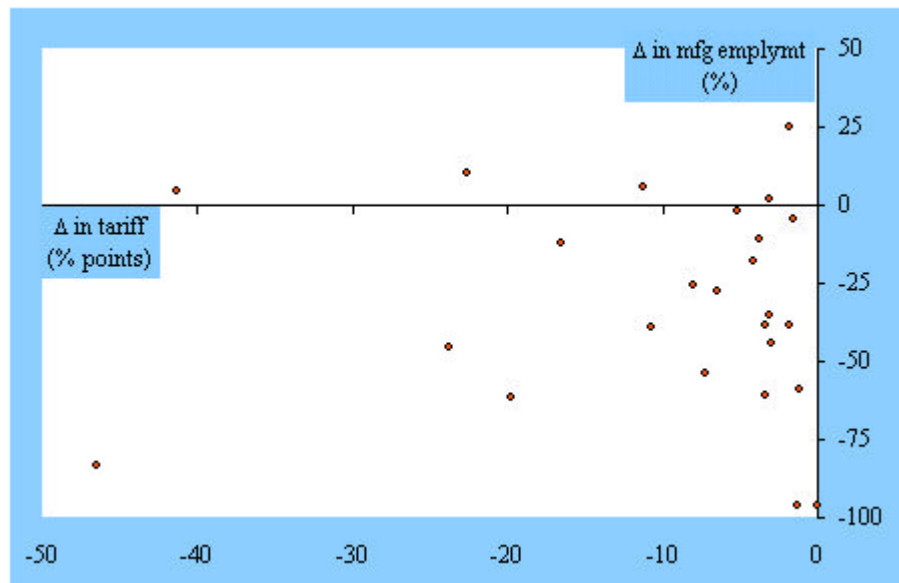


Figure 2.1

However, there are other large employment reductions but with only small tariff changes. The scatter of employment changes to tariff changes in *Figure 2.1* shows little relationship. Despite this picture, some simple relationships were attempted - with some using the data set with the outliers eliminated - but with minimal success.

Change in Hours Worked and Tariff by Industry (ex outliers) 1986-2001

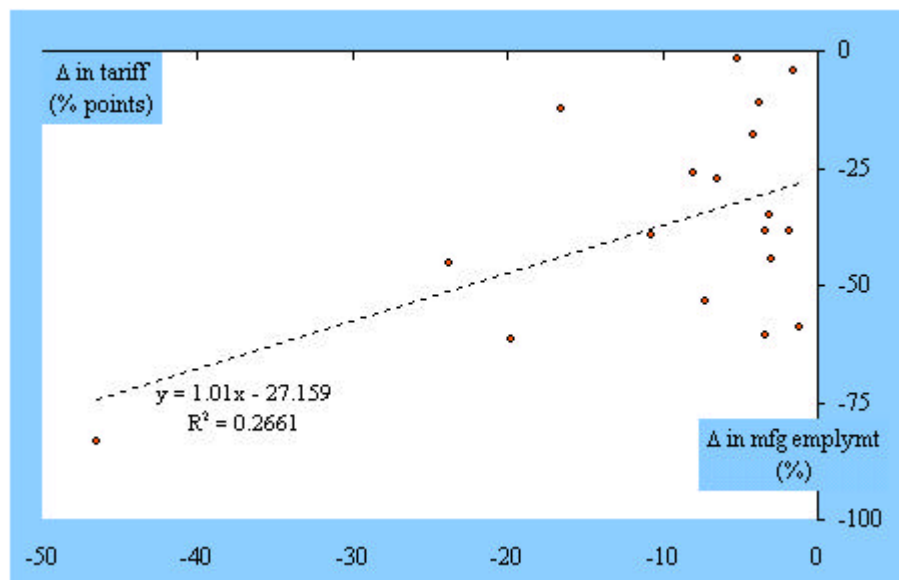


Figure 2.2

Excluding outliers (including those where employment rose) - leaves only 18 of original 29 observations - see *Figure 2.2*. Clearly, however, the 'pre-selection' of industries does not make this a particularly robust estimation process, even though some exclusions are entirely sensible (eg Chemicals and Petroleum).



For a more 'robust' adjustment to the data (and to allow for the overall reduction in manufacturing), the share of each industry within manufacturing was investigated.

Share of Industry in Total Manufacturing Employment (%)

| NZSIC industry | Hours as % of all mfg hours | | | |
|--|-----------------------------|--------------|--------------|--------------|
| | 1986 | 1991 | 1996 | 2001 |
| 311 Food manufacturing | 20.2 | 22.6 | 16.2 | 17.2 |
| 312 Food manufacturing | 1.2 | 1.7 | 4.7 | 5.0 |
| 313 Beverages | 1.3 | 1.4 | 1.4 | 1.8 |
| 314 Tobacco | 0.3 | 0.2 | 0.2 | 0.1 |
| 321 Textiles | 4.9 | 4.1 | 4.1 | 3.8 |
| 322 Clothing (ex footwear) | 6.4 | 5.8 | 4.7 | 3.4 |
| 323 Leather, Products, Substitues & Fur (ex ftwr & clthg) | 1.0 | 1.0 | 1.2 | 1.3 |
| 324 Footwear | 1.3 | 0.8 | 0.6 | 0.3 |
| 331 Wood and wood products | 6.0 | 6.5 | 7.3 | 8.1 |
| 332 Furniture and Fixtures | 2.7 | 3.1 | 4.1 | 4.2 |
| 341 Paper and paper products | 4.3 | 4.1 | 3.4 | 2.8 |
| 342 Printing, Publishing and Allied Industries | 6.7 | 7.8 | 9.0 | 8.8 |
| 351 Industrial Chemicals | 1.8 | 1.8 | 0.3 | 0.1 |
| 352 Other Chemical Products | 2.4 | 2.1 | 0.2 | 0.1 |
| 353 Petroleum Refineries | 0.6 | 0.4 | 1.7 | 1.7 |
| 354 Miscellaneous Products of Petroleum and Coal | 0.2 | 0.1 | 2.4 | 2.1 |
| 355 Rubber Products | 1.2 | 0.9 | 0.7 | 0.6 |
| 356 Plastic Products nec | 2.4 | 2.8 | 3.2 | 3.4 |
| 361 Pottery, China and Earthenware | 0.5 | 0.4 | 0.6 | 0.4 |
| 362 Glass and Glass Products | 0.9 | 0.7 | 0.5 | 0.5 |
| 369 Other Non-Metallic Mineral Products | 2.2 | 1.8 | 1.7 | 2.0 |
| 371 Iron and Steel Basic Industries | 1.5 | 1.6 | 1.4 | 1.2 |
| 372 Non-Ferrous Basic Metal Industries | 1.1 | 1.4 | 1.3 | 1.3 |
| 381 Fabricated Metal Products (ex machy and eqpmt) | 8.9 | 8.2 | 8.7 | 9.1 |
| 382 Machinery (ex electrical) | 6.8 | 7.0 | 7.7 | 7.8 |
| 383 Electrical Machinery | 4.9 | 4.0 | 4.7 | 4.9 |
| 384 Transport Equipment | 6.6 | 4.9 | 5.5 | 5.0 |
| 385 Prof, Scientific, Measuring eqpmt nec; Photo & Optical | 0.5 | 0.3 | 0.6 | 0.8 |
| 390 Other Manufacturing Industries | 1.5 | 2.1 | 2.0 | 2.2 |
| ALL MANUFACTURING | 100.0 | 100.0 | 100.0 | 100.0 |

Table 2.4

As Figure 2.3 – Figure 2.6 show, there is again little sign of any robust relationships, although two of the sub-periods indicate some relationship correlation.



Change in Manufacturing Employment Share and Tariff by Industry – 1986 to 2001

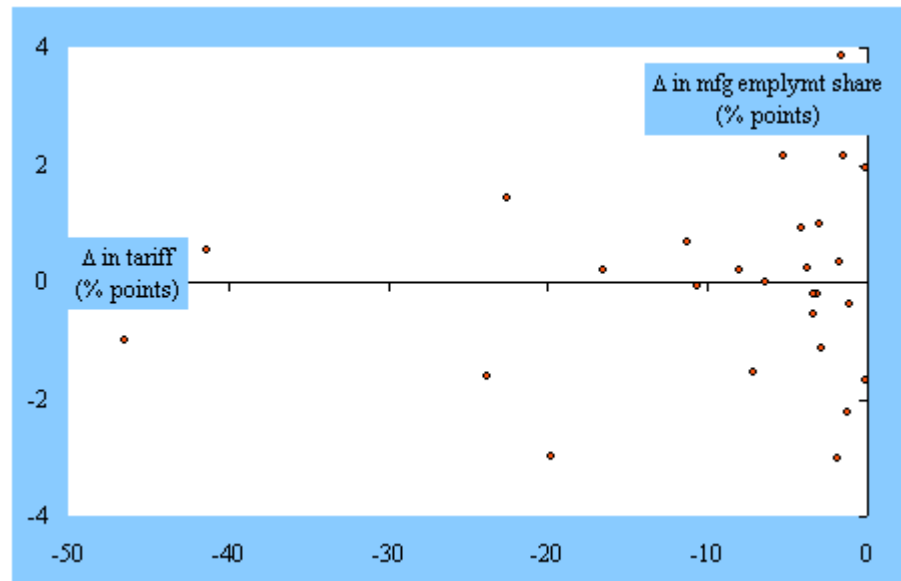


Figure 2.3

Change in Manufacturing Employment Share and Tariff by Industry 1986 to 1991

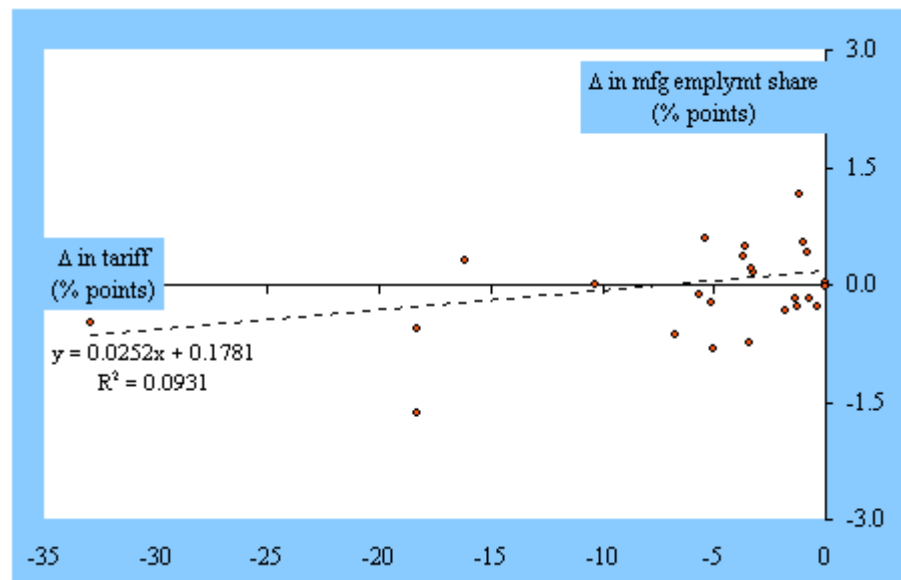


Figure 2.4



Change in Manufacturing Employment Share and Tariff by Industry 1991 to 1996

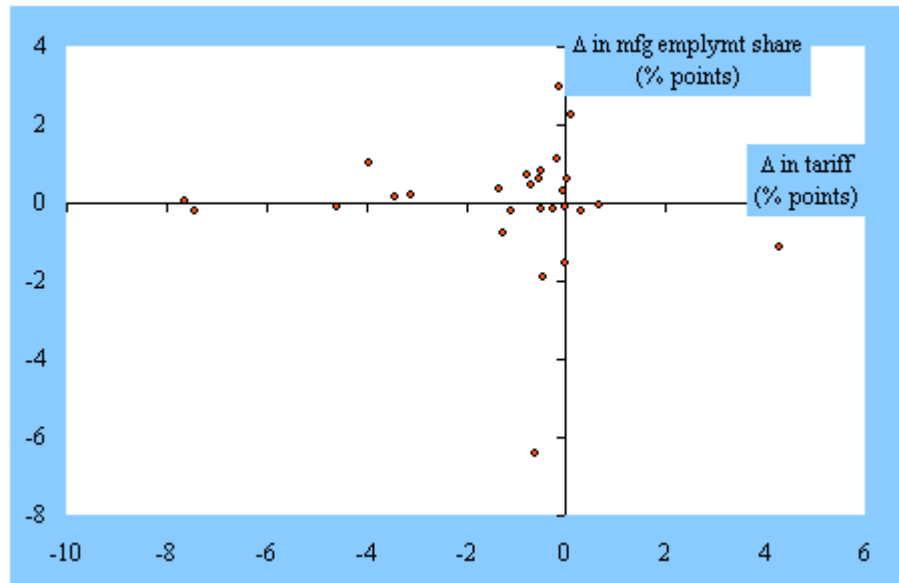


Figure 2.5

Change in Manufacturing Employment Share and Tariff by Industry 1996 to 2001

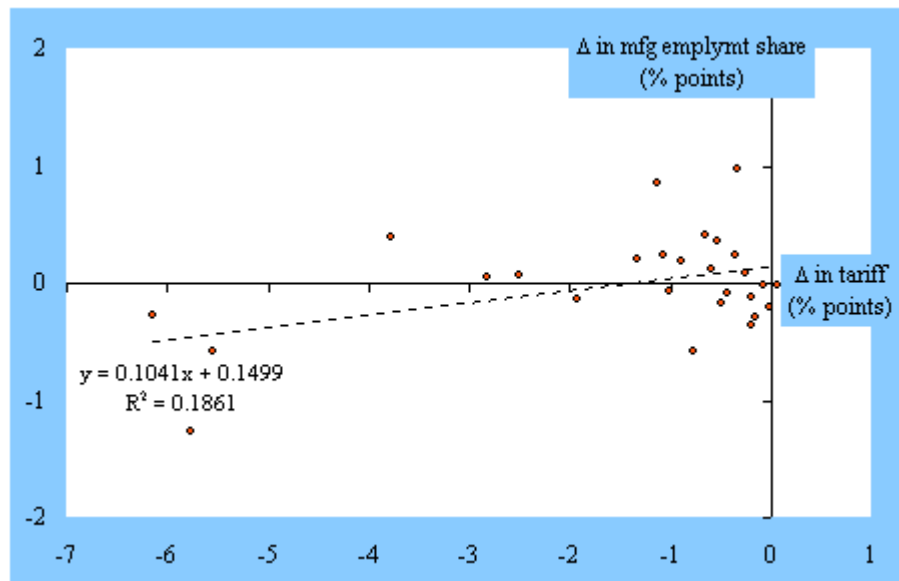


Figure 2.6

2.3 Manufacturing employment by region

Table 2.5, Table 2.6 and Figure 2.7 indicate hours worked and changes in employment by Territorial Local Authority (TLA) area.

The greatest reduction in percentage change terms in manufacturing hours worked over the 1986 to 2001 period was recorded in the Kawerau District (down 65% - accounted for by large reduction in paper), followed by Opotiki (down 59% - largely accounted for food manufacturing and clothing).



Noticeable also – see *Figure 2.7* – is that the bulk of the reductions in manufacturing employment are in the Auckland and lower North Island TLAs. In the Auckland TLAs, however, there are offsetting increases in employment in non-manufacturing industries, whereas this does not occur in the lower North Island TLAs.

Large spikes in the percentage changes in hours are largely the result of small changes in TLAs with a very low activity base. For example, Queenstown-Lakes District (manufacturing only 4% of total in 2001) and Mackenzie District (manufacturing only 2.1% of total in 2001).

To adjust for these misleading percentage changes, the change in the 'share of manufacturing' in each TLA was investigated – see *Table 2.7*, *Table 2.8* and *Figure 2.8*.

Over the 1986 to 2001 period, the largest percentage points reduction in the relative share of manufacturing was clearly recorded by Kawerau District - where (paper) manufacturing shrank from 65% of all hours in 1986 to just over 38% in 2001. This reduction of 27% points compares with the national mean decrease of 7.6% points (from 21.5% to 13.9%).

Other noticeable reductions in the share of manufacturing clearly occurred in the Auckland areas, as well as in some of the Wellington TLAs. On the other hand, South Island TLAs largely recorded below average changes in the manufacturing share and, indeed, in some cases recorded increases in the share of manufacturing.

The largest increases in manufacturing share over this period occurred in the Wairoa and Waitomo districts, where the leather and food manufacturing (meat processing, in particular) industries respectively contributed noticeably to increased hours worked.

Table 2.9 and *Table 2.10* show the mean tariff rate for each TLA. These were calculated by using the hours worked in each TLA in each industry as weights (in a chain linked manner) and applying these weights to the industry-specific tariff.

Large changes in mean regional tariffs occurred in Waitomo, Napier and Whangarei. In each case, however, these changes are not so much because the tariffs changed, but because the industry weights changed by substantial amounts. That is, there were substantial changes in employment in meat processing (Waitomo), tobacco processing (Napier) and petroleum (Whangarei).



North Island TLAs Employment Summary - Weekly Hours Worked (000s)

| Territorial Local Authority (TLA) area | In manufacturing | | | | In all industries | | | |
|--|------------------|---------------|---------------|---------------|-------------------|----------------|----------------|----------------|
| | 1986 | 1991 | 1996 | 2001 | 1986 | 1991 | 1996 | 2001 |
| Far North District | 79.3 | 55.3 | 57.0 | 63.5 | 753.0 | 639.3 | 749.9 | 799.6 |
| Whangarei District | 226.8 | 141.9 | 149.0 | 139.6 | 1211.1 | 952.2 | 1079.6 | 1133.1 |
| Kaipara District | 41.9 | 33.7 | 41.2 | 35.6 | 338.1 | 282.5 | 310.6 | 323.8 |
| Rodney District | 143.1 | 145.6 | 183.5 | 186.2 | 863.5 | 957.1 | 1261.2 | 1451.3 |
| North Shore City | 622.5 | 446.9 | 481.8 | 445.7 | 3033.2 | 3022.3 | 3519.8 | 3781.0 |
| Waitakere City | 748.3 | 547.8 | 577.6 | 529.0 | 2533.7 | 2480.7 | 2934.2 | 3130.8 |
| Auckland City | 1486.9 | 912.3 | 939.0 | 831.0 | 5860.2 | 5419.5 | 6546.2 | 7200.1 |
| Manukau City | 1470.4 | 979.3 | 1003.5 | 967.8 | 3957.7 | 3625.6 | 4315.1 | 4778.4 |
| Papakura District | 198.0 | 149.0 | 147.0 | 139.7 | 674.6 | 653.0 | 736.0 | 757.5 |
| Franklin District | 161.6 | 166.3 | 166.9 | 163.6 | 772.6 | 818.1 | 978.5 | 1065.9 |
| Thames-Coromandel District | 52.5 | 49.9 | 51.0 | 46.2 | 315.7 | 318.9 | 383.0 | 419.0 |
| Hauraki District | 57.0 | 40.6 | 39.0 | 32.0 | 311.2 | 280.9 | 295.9 | 302.9 |
| Waikato District | 97.6 | 82.0 | 88.3 | 91.7 | 721.6 | 640.9 | 707.6 | 761.3 |
| Matamata-Piako District | 96.7 | 105.8 | 93.3 | 86.3 | 635.0 | 586.9 | 616.0 | 607.1 |
| Hamilton City | 347.5 | 272.8 | 298.8 | 290.2 | 1811.9 | 1719.4 | 1969.4 | 2105.2 |
| Waipa District | 97.0 | 89.8 | 81.7 | 82.4 | 691.8 | 674.0 | 769.0 | 828.2 |
| Otorohanga District | 12.5 | 9.3 | 12.0 | 12.5 | 198.7 | 178.3 | 199.5 | 195.0 |
| South Waikato District | 206.0 | 133.5 | 99.4 | 98.1 | 560.7 | 447.2 | 411.7 | 407.3 |
| Waitomo District | 15.0 | 15.8 | 20.9 | 22.1 | 202.2 | 170.3 | 182.7 | 193.4 |
| Taupo District | 67.0 | 60.4 | 58.5 | 52.5 | 501.8 | 469.8 | 545.9 | 575.0 |
| Western Bay Of Plenty District | 68.5 | 63.7 | 77.2 | 82.6 | 520.4 | 520.2 | 632.4 | 712.7 |
| Tauranga District | 193.5 | 175.9 | 188.8 | 213.7 | 1045.4 | 1022.6 | 1271.9 | 1517.8 |
| Rotorua District | 201.6 | 127.2 | 141.5 | 154.9 | 1166.7 | 1011.2 | 1156.5 | 1164.7 |
| Whakatane District | 112.0 | 79.3 | 84.4 | 85.4 | 542.2 | 472.5 | 510.6 | 533.5 |
| Kawerau District | 94.7 | 64.8 | 41.5 | 32.7 | 144.9 | 115.1 | 102.7 | 85.3 |
| Opotiki District | 14.0 | 6.3 | 5.9 | 5.7 | 128.3 | 104.9 | 116.3 | 124.1 |
| Gisborne District | 137.1 | 98.7 | 85.7 | 73.2 | 817.8 | 648.5 | 716.0 | 726.0 |
| Wairoa District | 21.7 | 26.1 | 22.4 | 25.1 | 170.7 | 139.1 | 143.7 | 142.7 |
| Hastings District | 315.8 | 244.0 | 189.5 | 200.0 | 1160.6 | 1068.2 | 1188.3 | 1234.9 |
| Napier City | 217.8 | 161.2 | 161.7 | 156.1 | 925.1 | 802.9 | 915.4 | 955.1 |
| Central Hawke's Bay District | 46.4 | 34.3 | 42.1 | 53.2 | 248.8 | 226.4 | 264.1 | 280.6 |
| New Plymouth District | 269.5 | 220.8 | 200.3 | 174.9 | 1287.8 | 1128.7 | 1200.0 | 1167.2 |
| Stratford District | 22.1 | 18.5 | 24.3 | 24.8 | 212.1 | 173.7 | 184.4 | 185.9 |
| South Taranaki District | 107.4 | 94.6 | 100.5 | 99.7 | 630.8 | 542.7 | 564.4 | 565.1 |
| Ruapehu District | 30.8 | 29.7 | 25.6 | 16.8 | 397.6 | 305.7 | 320.3 | 279.2 |
| Wanganui District | 162.7 | 114.2 | 107.1 | 120.1 | 735.6 | 635.3 | 671.6 | 687.0 |
| Rangitikei District | 44.5 | 35.4 | 34.9 | 28.8 | 338.7 | 286.4 | 303.3 | 289.0 |
| Manawatu District | 99.8 | 91.2 | 88.2 | 79.5 | 513.0 | 504.4 | 546.9 | 558.0 |
| Palmerston North City | 235.4 | 177.8 | 171.5 | 142.8 | 1240.3 | 1178.6 | 1302.9 | 1316.7 |
| Taranua District | 63.9 | 65.1 | 55.4 | 55.4 | 397.9 | 359.6 | 369.3 | 367.4 |
| Horowhenua District | 128.4 | 90.8 | 84.6 | 74.3 | 488.7 | 437.2 | 455.3 | 465.3 |
| Kapiti Coast District | 82.2 | 71.6 | 69.6 | 64.4 | 474.8 | 526.3 | 590.4 | 681.4 |
| Porirua City | 158.3 | 106.4 | 95.6 | 82.3 | 822.2 | 732.4 | 745.1 | 822.8 |
| Upper Hutt City | 169.1 | 104.8 | 98.5 | 79.1 | 733.2 | 681.5 | 677.5 | 689.1 |
| Lower Hutt City | 467.5 | 291.8 | 275.9 | 231.3 | 1893.5 | 1705.4 | 1772.8 | 1819.9 |
| Wellington City | 363.8 | 220.2 | 227.8 | 197.3 | 3355.3 | 3176.3 | 3489.0 | 3696.2 |
| Masterton District | 78.3 | 51.4 | 58.8 | 52.8 | 392.9 | 348.6 | 381.8 | 399.5 |
| Carterton District | 29.1 | 18.6 | 16.6 | 19.2 | 124.3 | 115.5 | 121.8 | 136.2 |
| South Wairarapa District | 29.0 | 18.5 | 17.4 | 18.6 | 164.8 | 152.8 | 155.2 | 173.8 |
| Total, North Island | 10192.6 | 7340.7 | 7382.6 | 6960.7 | 47023.0 | 43459.5 | 49381.6 | 52593.0 |

Table 2.5



South Island TLAs Employment Summary - Weekly Hours Worked (000s)

| Territorial Local Authority (TLA) area | In manufacturing | | | | In all industries | | | |
|--|------------------|---------------|----------------|---------------|-------------------|----------------|----------------|----------------|
| | 1986 | 1991 | 1996 | 2001 | 1986 | 1991 | 1996 | 2001 |
| Tasman District | 99.4 | 94.7 | 105.5 | 107.4 | 656.8 | 643.7 | 779.1 | 867.4 |
| Nelson City | 132.5 | 116.3 | 115.0 | 112.7 | 656.8 | 620.6 | 740.8 | 771.8 |
| Marlborough District | 85.3 | 103.2 | 110.5 | 128.7 | 621.1 | 618.5 | 750.3 | 811.0 |
| Kaikoura District | 4.8 | 4.3 | 6.6 | 6.4 | 63.7 | 55.2 | 67.8 | 73.4 |
| Buller District | 34.5 | 19.1 | 18.6 | 14.8 | 191.3 | 161.9 | 173.7 | 168.3 |
| Grey District | 46.1 | 30.0 | 29.4 | 28.2 | 266.0 | 220.2 | 243.9 | 248.7 |
| Westland District | 23.2 | 21.0 | 18.5 | 21.1 | 174.7 | 159.5 | 175.2 | 175.7 |
| Hurunui District | 10.2 | 11.5 | 11.6 | 18.7 | 184.6 | 176.7 | 202.8 | 225.4 |
| Waimakariri District | 121.4 | 117.8 | 121.3 | 135.7 | 457.8 | 508.2 | 648.1 | 753.4 |
| Christchurch City | 1377.5 | 953.6 | 1042.3 | 998.4 | 5198.2 | 4832.9 | 5585.7 | 5899.4 |
| Banks Peninsula District | 17.9 | 14.4 | 15.6 | 16.9 | 140.0 | 129.0 | 152.5 | 166.3 |
| Selwyn District | 47.7 | 49.0 | 62.0 | 78.4 | 447.3 | 460.3 | 535.2 | 648.6 |
| Ashburton District | 75.5 | 67.0 | 94.0 | 99.0 | 495.1 | 463.2 | 533.3 | 578.8 |
| Timaru District | 185.5 | 160.9 | 179.6 | 170.6 | 772.0 | 675.9 | 757.7 | 780.6 |
| Mackenzie District | 1.0 | 1.3 | 2.4 | 1.8 | 91.6 | 74.3 | 94.3 | 93.1 |
| Waimate District | 20.5 | 15.9 | 20.2 | 24.5 | 151.8 | 135.5 | 151.4 | 152.9 |
| Chatham Islands District | 3.3 | 2.8 | 2.5 | 2.2 | 20.3 | 15.6 | 16.1 | 16.4 |
| Waitaki District | 80.0 | 74.8 | 76.4 | 83.8 | 400.7 | 366.5 | 397.3 | 387.6 |
| Central Otago District | 18.9 | 16.7 | 15.2 | 22.8 | 337.8 | 291.6 | 309.1 | 319.3 |
| Queenstown-Lakes District | 8.4 | 9.6 | 12.6 | 17.5 | 203.3 | 224.9 | 367.9 | 439.8 |
| Dunedin City | 419.0 | 286.2 | 279.7 | 285.9 | 2011.0 | 1795.8 | 1973.3 | 1993.3 |
| Clutha District | 82.6 | 69.2 | 74.6 | 79.9 | 397.6 | 357.1 | 380.9 | 403.5 |
| Southland District | 76.7 | 79.1 | 75.9 | 76.2 | 754.4 | 675.1 | 732.9 | 761.4 |
| Gore District | 65.7 | 61.1 | 67.1 | 65.3 | 270.9 | 245.5 | 270.1 | 274.0 |
| Invercargill City | 288.4 | 256.0 | 209.3 | 213.8 | 1050.5 | 913.1 | 968.7 | 917.5 |
| Total, South Island | 3325.9 | 2635.5 | 2766.6 | 2810.8 | 16033.2 | 14820.6 | 17008.1 | 17927.8 |
| NEC | 0.4 | 0.3 | 0.4 | 0.8 | 59.1 | 18.4 | 23.9 | 11.3 |
| Total, New Zealand | 13540.1 | 9979.1 | 10166.5 | 9792.3 | 63097.2 | 58298.1 | 66398.4 | 70518.4 |

Table 2.6



Change in Employment by TLA - 1986 to 2001 (%)

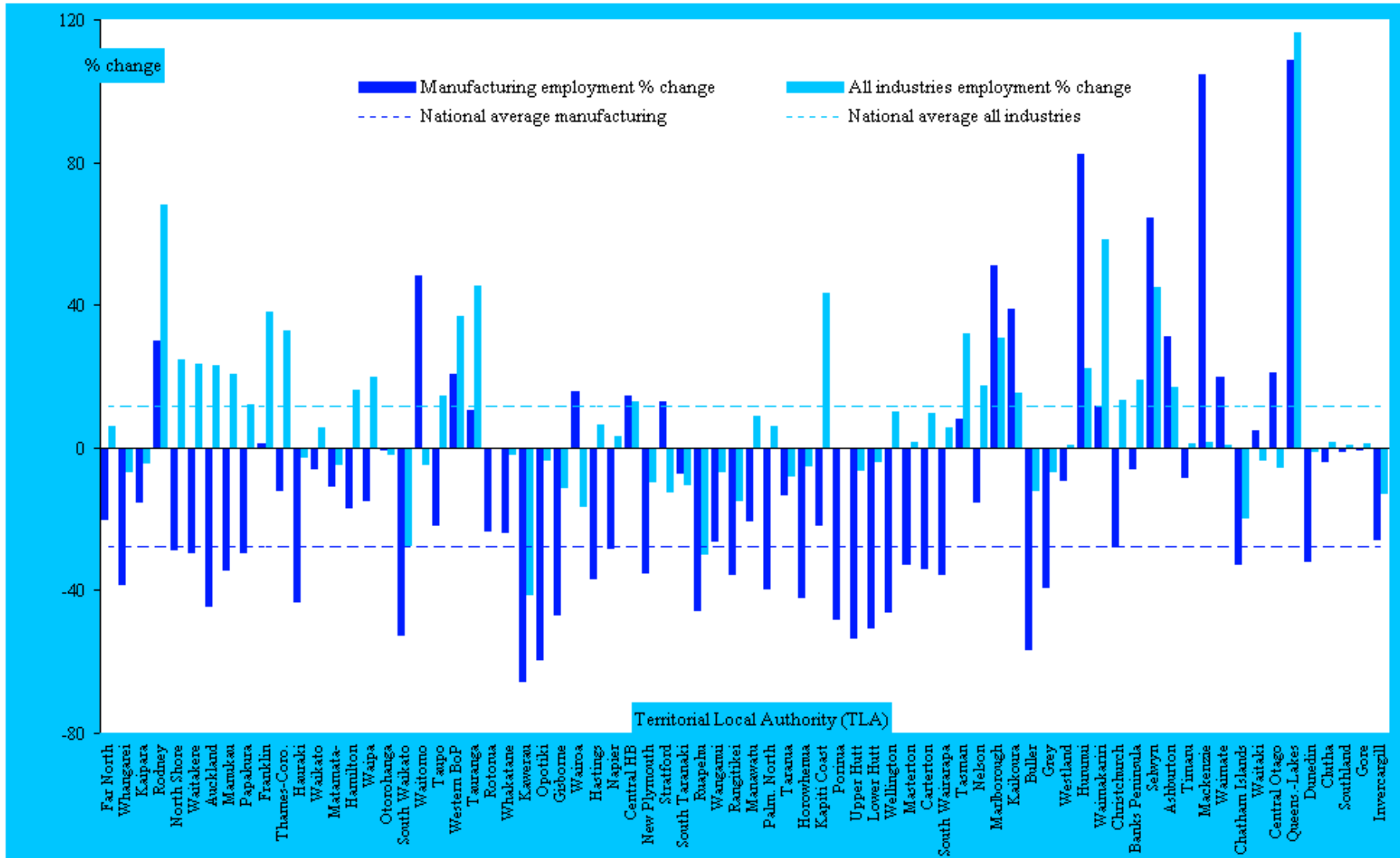


Figure 2.7



North Island TLAs - Share of Manufacturing in Total Employment (%)

| Territorial Local Authority (TLA) area | Manufacturing hours as % of all hours worked | | | |
|---|--|-------------|-------------|-------------|
| | 1986 | 1991 | 1996 | 2001 |
| Far North District | 10.5 | 8.7 | 7.6 | 7.9 |
| Whangarei District | 18.7 | 14.9 | 13.8 | 12.3 |
| Kaipara District | 12.4 | 11.9 | 13.3 | 11.0 |
| Rodney District | 16.6 | 15.2 | 14.6 | 12.8 |
| North Shore City | 20.5 | 14.8 | 13.7 | 11.8 |
| Waitakere City | 29.5 | 22.1 | 19.7 | 16.9 |
| Auckland City | 25.4 | 16.8 | 14.3 | 11.5 |
| Manukau City | 37.2 | 27.0 | 23.3 | 20.3 |
| Papakura District | 29.3 | 22.8 | 20.0 | 18.4 |
| Franklin District | 20.9 | 20.3 | 17.1 | 15.4 |
| Thames-Coromandel District | 16.6 | 15.6 | 13.3 | 11.0 |
| Hauraki District | 18.3 | 14.5 | 13.2 | 10.6 |
| Waikato District | 13.5 | 12.8 | 12.5 | 12.0 |
| Matamata-Piako District | 15.2 | 18.0 | 15.1 | 14.2 |
| Hamilton City | 19.2 | 15.9 | 15.2 | 13.8 |
| Waipa District | 14.0 | 13.3 | 10.6 | 10.0 |
| Otorohanga District | 6.3 | 5.2 | 6.0 | 6.4 |
| South Waikato District | 36.7 | 29.8 | 24.1 | 24.1 |
| Waitomo District | 7.4 | 9.3 | 11.5 | 11.4 |
| Taupo District | 13.3 | 12.9 | 10.7 | 9.1 |
| Western Bay Of Plenty District | 13.2 | 12.2 | 12.2 | 11.6 |
| Tauranga District | 18.5 | 17.2 | 14.8 | 14.1 |
| Rotorua District | 17.3 | 12.6 | 12.2 | 13.3 |
| Whakatane District | 20.7 | 16.8 | 16.5 | 16.0 |
| Kawerau District | 65.3 | 56.3 | 40.4 | 38.3 |
| Opotiki District | 10.9 | 6.0 | 5.1 | 4.6 |
| Gisborne District | 16.8 | 15.2 | 12.0 | 10.1 |
| Wairoa District | 12.7 | 18.8 | 15.6 | 17.6 |
| Hastings District | 27.2 | 22.8 | 15.9 | 16.2 |
| Napier City | 23.5 | 20.1 | 17.7 | 16.3 |
| Central Hawke's Bay District | 18.6 | 15.1 | 15.9 | 19.0 |
| New Plymouth District | 20.9 | 19.6 | 16.7 | 15.0 |
| Stratford District | 10.4 | 10.6 | 13.2 | 13.3 |
| South Taranaki District | 17.0 | 17.4 | 17.8 | 17.6 |
| Ruapehu District | 7.8 | 9.7 | 8.0 | 6.0 |
| Wanganui District | 22.1 | 18.0 | 16.0 | 17.5 |
| Rangitikei District | 13.1 | 12.4 | 11.5 | 9.9 |
| Manawatu District | 19.5 | 18.1 | 16.1 | 14.3 |
| Palmerston North City | 19.0 | 15.1 | 13.2 | 10.8 |
| Tararua District | 16.1 | 18.1 | 15.0 | 15.1 |
| Horowhenua District | 26.3 | 20.8 | 18.6 | 16.0 |
| Kapiti Coast District | 17.3 | 13.6 | 11.8 | 9.5 |
| Porirua City | 19.3 | 14.5 | 12.8 | 10.0 |
| Upper Hutt City | 23.1 | 15.4 | 14.5 | 11.5 |
| Lower Hutt City | 24.7 | 17.1 | 15.6 | 12.7 |
| Wellington City | 10.8 | 6.9 | 6.5 | 5.3 |
| Masterton District | 19.9 | 14.7 | 15.4 | 13.2 |
| Carterton District | 23.4 | 16.1 | 13.6 | 14.1 |
| South Wairarapa District | 17.6 | 12.1 | 11.2 | 10.7 |
| Total, North Island | 21.7 | 16.9 | 15.0 | 13.2 |

Table 2.7



South Island TLAs - Share of Manufacturing in Total Employment (%)

| Territorial Local Authority (TLA) area | Manufacturing hours as % of all hours worked | | | |
|--|--|-------------|-------------|-------------|
| | 1986 | 1991 | 1996 | 2001 |
| Tasman District | 15.1 | 14.7 | 13.5 | 12.4 |
| Nelson City | 20.2 | 18.7 | 15.5 | 14.6 |
| Marlborough District | 13.7 | 16.7 | 14.7 | 15.9 |
| Kaikoura District | 7.5 | 7.7 | 9.8 | 8.8 |
| Buller District | 18.0 | 11.8 | 10.7 | 8.8 |
| Grey District | 17.3 | 13.6 | 12.1 | 11.3 |
| Westland District | 13.3 | 13.2 | 10.6 | 12.0 |
| Hurunui District | 5.5 | 6.5 | 5.7 | 8.3 |
| Waimakariri District | 26.5 | 23.3 | 18.7 | 18.0 |
| Christchurch City | 26.5 | 19.7 | 18.7 | 16.9 |
| Banks Peninsula District | 12.8 | 11.1 | 10.2 | 10.2 |
| Selwyn District | 10.7 | 10.6 | 11.6 | 12.1 |
| Ashburton District | 15.2 | 14.5 | 17.6 | 17.1 |
| Timaru District | 24.0 | 23.8 | 23.7 | 21.9 |
| Mackenzie District | 1.1 | 1.7 | 2.6 | 1.9 |
| Waimate District | 13.5 | 11.8 | 13.4 | 16.0 |
| Chatham Islands District | 16.0 | 18.3 | 15.6 | 13.4 |
| Waitaki District | 20.0 | 20.4 | 19.2 | 21.6 |
| Central Otago District | 5.6 | 5.7 | 4.9 | 7.1 |
| Queenstown-Lakes District | 4.1 | 4.3 | 3.4 | 4.0 |
| Dunedin City | 20.8 | 15.9 | 14.2 | 14.3 |
| Clutha District | 20.8 | 19.4 | 19.6 | 19.8 |
| Southland District | 10.2 | 11.7 | 10.4 | 10.0 |
| Gore District | 24.2 | 24.9 | 24.9 | 23.8 |
| Invercargill City | 27.5 | 28.0 | 21.6 | 23.3 |
| Total, South Island | 20.7 | 17.8 | 16.3 | 15.7 |
| NEC | 0.7 | 1.5 | 1.8 | 6.7 |
| Total, New Zealand | 21.5 | 17.1 | 15.3 | 13.9 |

Table 2.8



Change in Manufacturing Share of Employment by TLA - 1986 to 2001 (% points)

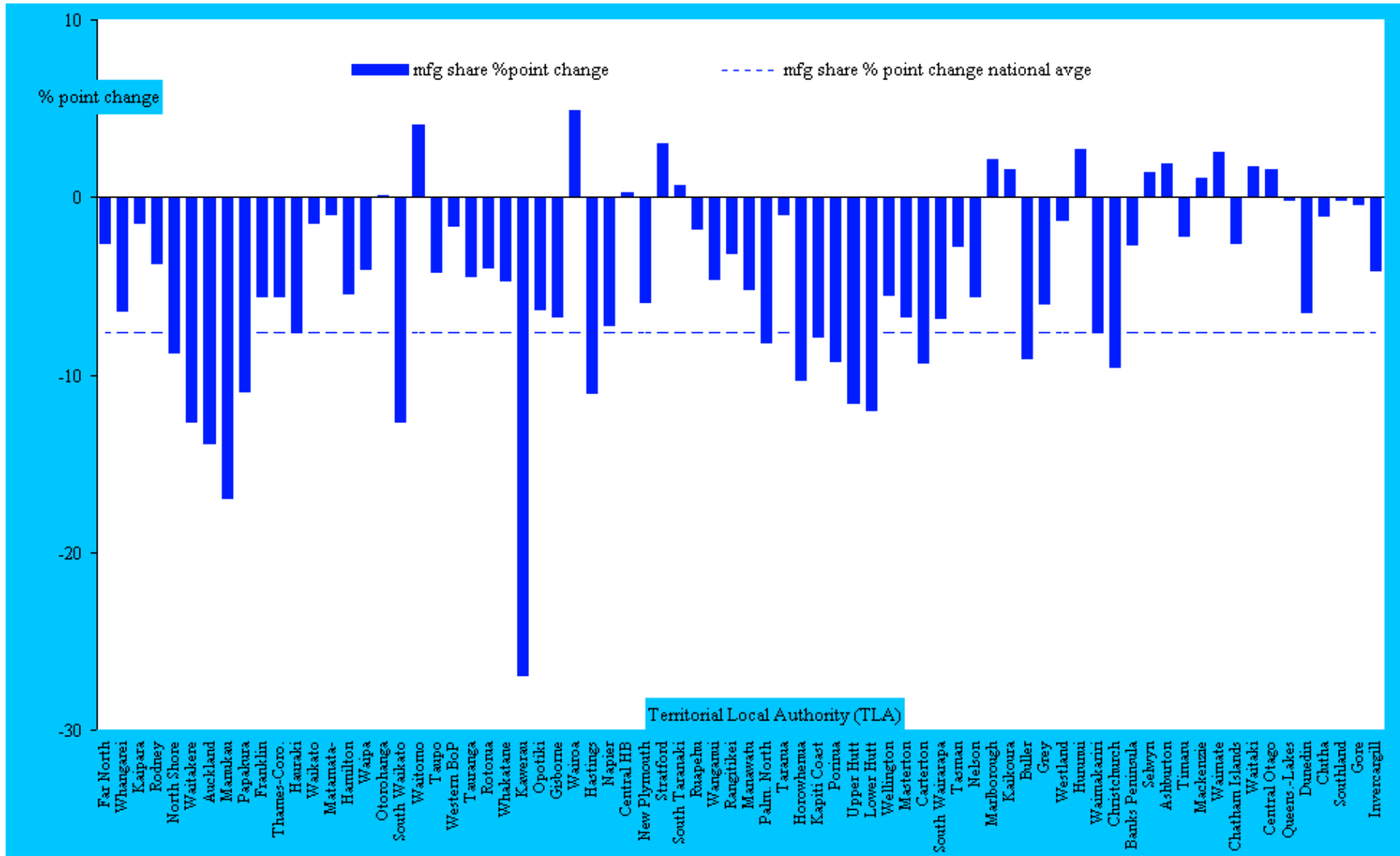


Figure 2.8



Tariff by Region - North Island TLAs

| Territorial Local Authority (TLA) area | Tariff (%) | | | |
|--|------------|------|------|------|
| | 1986 | 1991 | 1996 | 2001 |
| Far North District | 6.0 | 3.0 | 2.3 | 1.2 |
| Whangarei District | 19.5 | 9.4 | 9.2 | 3.6 |
| Kaipara District | 9.0 | 3.9 | 2.5 | 1.2 |
| Rodney District | 13.1 | 5.5 | 3.9 | 2.4 |
| North Shore City | 12.4 | 4.5 | 3.4 | 2.0 |
| Waitakere City | 13.4 | 5.6 | 4.4 | 2.6 |
| Auckland City | 12.2 | 5.3 | 4.4 | 2.9 |
| Manukau City | 11.6 | 4.3 | 3.7 | 2.6 |
| Papakura District | 10.3 | 3.5 | 3.2 | 2.2 |
| Franklin District | 8.0 | 2.6 | 2.7 | 1.7 |
| Thames-Coromandel District | 12.1 | 3.9 | 3.4 | 1.3 |
| Hauraki District | 10.5 | 3.9 | 3.4 | 1.7 |
| Waikato District | 10.2 | 3.9 | 3.1 | 1.3 |
| Matamata-Piako District | 7.2 | 3.1 | 2.7 | 1.0 |
| Hamilton City | 10.6 | 3.7 | 3.0 | 1.1 |
| Waipa District | 8.7 | 3.5 | 3.2 | 1.1 |
| Otorohanga District | 16.1 | 3.1 | 3.1 | 0.7 |
| South Waikato District | 8.0 | 2.7 | 1.5 | 1.0 |
| Waitomo District | 26.9 | 10.6 | 4.3 | 1.0 |
| Taupo District | 9.8 | 3.6 | 2.1 | 1.4 |
| Western Bay Of Plenty District | 8.0 | 3.1 | 2.6 | 1.7 |
| Tauranga District | 9.1 | 3.2 | 3.1 | 2.0 |
| Rotorua District | 10.0 | 3.5 | 1.9 | 1.1 |
| Whakatane District | 7.6 | 3.1 | 2.1 | 0.9 |
| Kawerau District | 7.4 | 2.6 | 1.3 | 0.7 |
| Opotiki District | 15.4 | 6.4 | 2.0 | 1.0 |
| Gisborne District | 6.7 | 4.2 | 4.1 | 4.4 |
| Wairoa District | 3.3 | 1.7 | 0.5 | 1.1 |
| Hastings District | 6.7 | 4.6 | 4.3 | 4.4 |
| Napier City | 32.7 | 27.4 | 17.1 | 16.0 |
| Central Hawke's Bay District | 4.0 | 2.2 | 1.1 | 0.6 |
| New Plymouth District | 11.5 | 6.7 | 4.5 | 1.0 |
| Stratford District | 10.9 | 4.6 | 2.3 | 0.8 |
| South Taranaki District | 5.4 | 2.1 | 1.4 | 0.7 |
| Ruapehu District | 8.3 | 2.5 | 1.1 | 0.5 |
| Wanganui District | 10.5 | 4.1 | 3.5 | 1.6 |
| Rangitikei District | 7.8 | 3.6 | 2.9 | 1.6 |
| Manawatu District | 7.0 | 2.9 | 2.3 | 1.3 |
| Palmerston North City | 7.4 | 2.9 | 3.1 | 1.5 |
| Tararua District | 12.9 | 5.8 | 3.6 | 2.0 |
| Horowhenua District | 10.8 | 4.2 | 5.0 | 3.0 |
| Kapiti Coast District | 12.3 | 6.1 | 4.4 | 1.8 |
| Porirua City | 12.6 | 4.3 | 3.0 | 2.1 |
| Upper Hutt City | 13.0 | 4.6 | 4.4 | 1.9 |
| Lower Hutt City | 15.2 | 8.6 | 6.8 | 6.2 |
| Wellington City | 11.3 | 4.8 | 4.2 | 2.9 |
| Masterton District | 8.6 | 4.2 | 3.4 | 1.7 |
| Carterton District | 16.5 | 8.3 | 4.1 | 3.1 |
| South Wairarapa District | 14.4 | 7.8 | 8.1 | 10.2 |

Table 2.9



Tariff by Region - South Island TLAs

| Territorial Local Authority (TLA) area | Tariff (%) | | | |
|--|------------|------|------|------|
| | 1986 | 1991 | 1996 | 2001 |
| Tasman District | 10.5 | 5.9 | 3.0 | 2.1 |
| Nelson City | 11.5 | 3.7 | 3.2 | 1.9 |
| Marlborough District | 10.8 | 6.9 | 4.7 | 5.8 |
| Kaikoura District | 5.0 | 2.0 | 1.1 | 0.6 |
| Buller District | 11.0 | 3.1 | 3.3 | 0.9 |
| Grey District | 11.3 | 3.5 | 3.1 | 1.4 |
| Westland District | 6.3 | 2.4 | 1.5 | 0.6 |
| Hurunui District | 11.3 | 4.7 | 5.2 | 6.6 |
| Waimakariri District | 9.7 | 4.1 | 3.7 | 2.0 |
| Christchurch City | 11.8 | 4.7 | 4.0 | 2.1 |
| Banks Peninsula District | 15.7 | 4.8 | 4.3 | 2.5 |
| Selwyn District | 8.8 | 4.2 | 3.3 | 1.8 |
| Ashburton District | 6.0 | 2.4 | 2.2 | 1.0 |
| Timaru District | 9.1 | 4.3 | 2.7 | 1.7 |
| Mackenzie District | 3.6 | 2.5 | 0.6 | 0.3 |
| Waimate District | 9.1 | 2.7 | 2.4 | 1.6 |
| Chatham Islands District | 2.6 | 1.4 | 1.3 | 0.8 |
| Waitaki District | 5.1 | 2.5 | 1.6 | 0.5 |
| Central Otago District | 5.1 | 2.1 | 2.5 | 5.1 |
| Queenstown-Lakes District | 8.5 | 6.6 | 6.2 | 7.0 |
| Dunedin City | 10.7 | 3.9 | 3.1 | 1.6 |
| Clutha District | 5.6 | 2.1 | 1.0 | 0.3 |
| Southland District | 4.7 | 2.0 | 1.3 | 0.6 |
| Gore District | 4.4 | 1.8 | 0.7 | 0.3 |
| Invercargill City | 4.7 | 1.5 | 1.4 | 0.7 |

Table 2.10



Comparing the change in the manufacturing employment share to the change in tariff over the whole 1986 to 2001 period shows little relationship. Interestingly, however, the 1986 to 1991 period shows some relationship, but again there are clearly many influences besides tariff changes which impacted on manufacturing.

Change in Manufacturing Employment Share and Tariff by Region 1986 to 2001

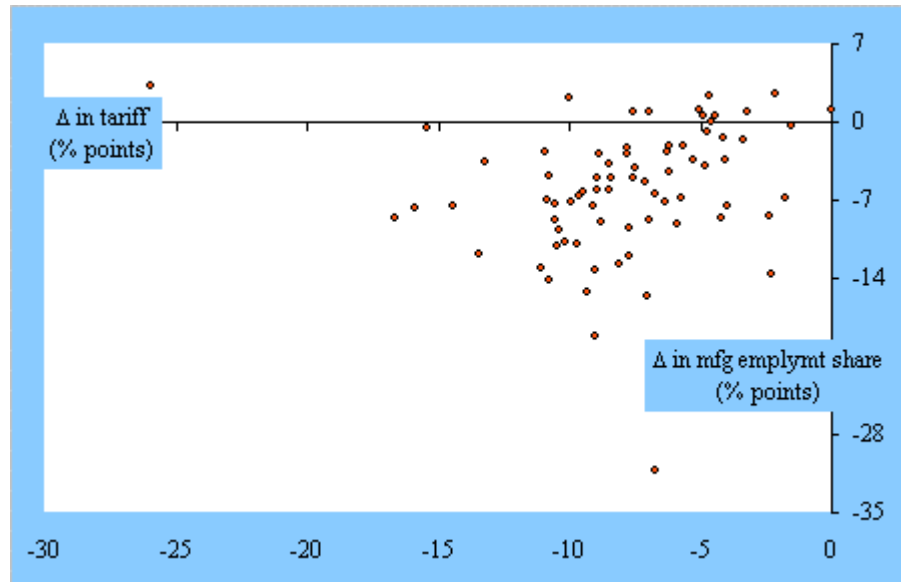


Figure 2.9

Change in Manufacturing Employment Share and Tariff by Region 1986 to 1991

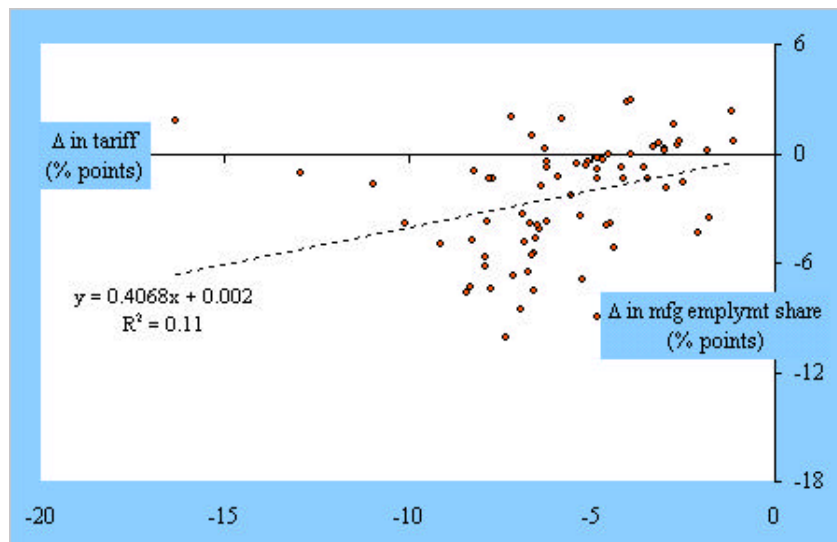


Figure 2.10



Change in Manufacturing Employment Share and Tariff by Region 1991 to 1996

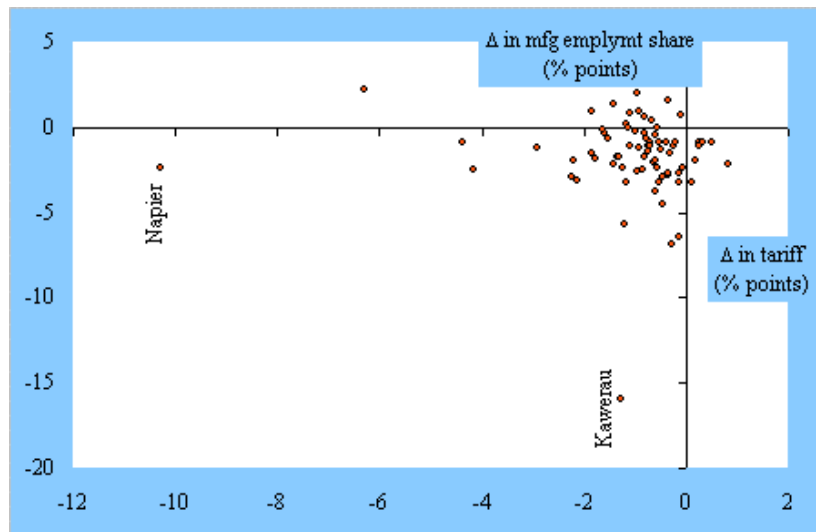


Figure 2.11

Change in Manufacturing Employment Share and Tariff by Region 1996 to 2001

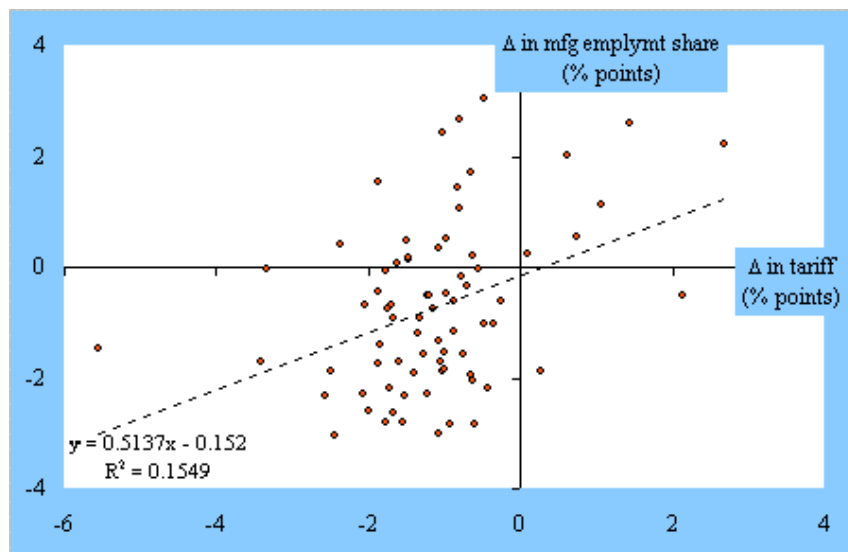


Figure 2.12

2.4 Manufacturing employment by ethnicity

As noted previously, weekly hours worked in manufacturing have declined, while those in the total economy have increased over the 1991 to 2001 period. Consequently, manufacturing accounted for about 14% of total hours worked in 2001; down from 21.5% fifteen years earlier. See *Table 2.11*.



Average Weekly Hours Worked by Ethnic Group ('000)

| | 1986 | 1991 | 1996 | 2001 | % point change | |
|--|-------|-------|-------|-------|----------------|-------|
| | | | | | 86-01 | 91-01 |
| Total Economy | | | | | | |
| European only | 54079 | 50112 | 54367 | 56406 | | |
| Maori | 6013 | 4774 | 7093 | 7475 | | |
| Pacific People | 1942 | 1708 | 2381 | 2858 | | |
| Asian | 981 | 1605 | 2343 | 3458 | | |
| Other | 75 | 100 | 200 | 305 | | |
| All | 63090 | 58299 | 66385 | 70504 | | |
| Manufacturing | | | | | | |
| European only | 10517 | 7898 | 7756 | 7325 | | |
| Maori | 1782 | 1104 | 1323 | 1273 | | |
| Pacific People | 985 | 650 | 696 | 714 | | |
| Asian | 236 | 306 | 362 | 443 | | |
| Other | 16 | 17 | 28 | 34 | | |
| Total Manufacturing | 13537 | 9976 | 10164 | 9788 | | |
| % of Manufacturing in Total Economy | | | | | | |
| European only | 19.4 | 15.8 | 14.3 | 13.0 | -6.5 | -2.8 |
| Maori | 29.6 | 23.1 | 18.7 | 17.0 | -12.6 | -6.1 |
| Pacific People | 50.7 | 38.0 | 29.2 | 25.0 | -25.7 | -13.1 |
| Asian | 24.1 | 19.1 | 15.4 | 12.8 | -11.3 | -6.2 |
| Other | 21.8 | 17.4 | 13.8 | 11.0 | -10.9 | -6.4 |
| Total Manufacturing | 21.5 | 17.1 | 15.3 | 13.9 | -7.6 | -3.2 |

Table 2.11

This 7.6% percentage point reduction in the relative size of manufacturing (as measured by average hours worked) is reflected across all ethnic groups. The nearly 26 percentage-point reduction in the Pacific People ethnic group is most noticeable. The next largest reductions are in Maori and Asian groups. In contrast, the European only group experienced the least decline at 6.5 percentage-points - slightly below the overall manufacturing average decline.

This relative shift is also illustrated in the following figures - where the reduction between 1986 and 2001 in importance of manufacturing in the Pacific People ethnic group is particularly noticeable.

The 2001 composition (by ethnic group) of the hours worked within each manufacturing industry is provided in *Table 2.12*, with the change in this composition since 1986 listed in *Table 2.13*.

In terms of the share of each ethnic group in overall manufacturing hours worked, the above table show declines between 1986 and 2001 being recorded by the European only and Maori ethnic groups - the latter albeit only a small decline. This is in contrast to the relative share of Maori in the overall economy rising, further reinforcing the picture of the decline in importance of manufacturing. On the other hand, the share of the Asian



Hours Worked in Manufacturing as a % of All Hours Worked by Ethnic Group - 1986

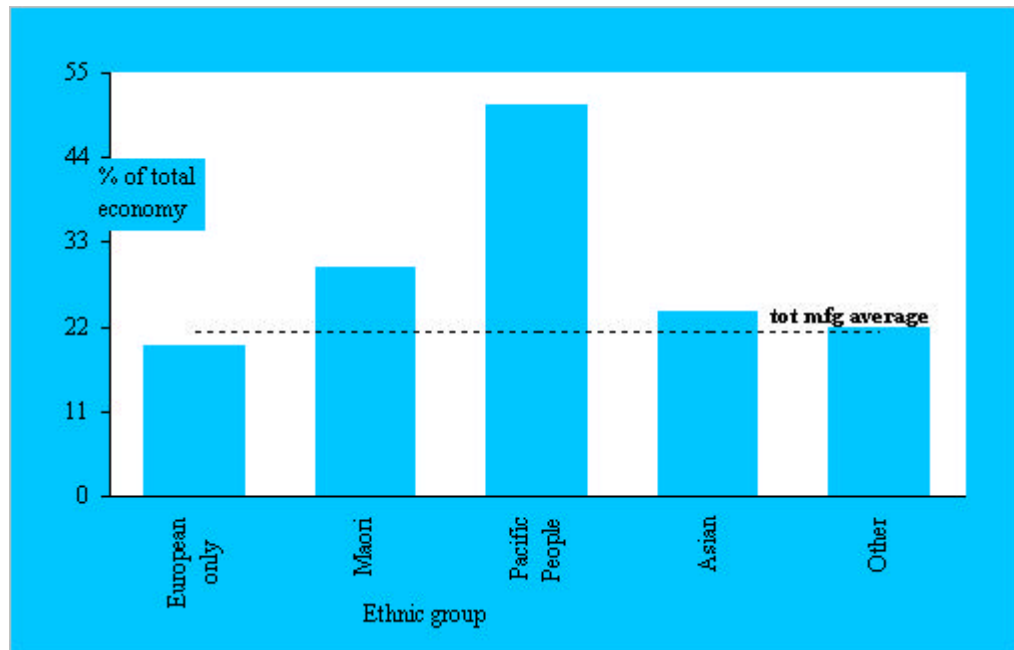


Figure 2.13

Hours Worked in Manufacturing as a % of All Hours Worked by Ethnic Group – 2001

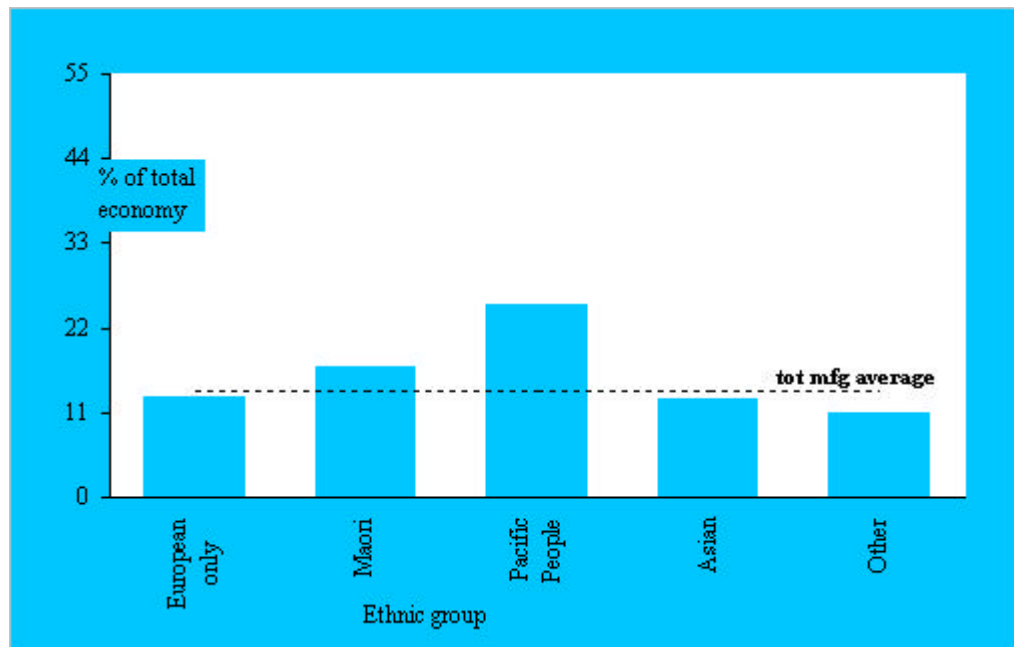


Figure 2.14

group has increased markedly across both the overall economy as well as manufacturing in particular.

Amongst the individual industries, the changes of particular interest relate to the noticeably large declines for the European group in food



manufacturing, clothing (ex footwear), footwear, paper, other chemicals and plastics. Of note at the other end of the spectrum is the large increase for this group in transport equipment. For the Maori ethnic group however, the most noticeable movements were in clothing (ex footwear) and footwear - both down - and the increase in the leather industry. Changes worthy of note for the Pacific People group were the increase in footwear, but the contrasting decline in transport equipment. Standing out for the Asian group, are the large increases in both the clothing (excl footwear) and footwear industries - and also in electrical machinery.

Little clear pattern or relationship in the change in importance of each ethnic group and the change in tariff was present however. As shown in the charts in *Figure 2.15*, there is little to relate the movements across the industries to tariff changes experienced by those industries over the 1986 to 2001 period.

Composition of Manufacturing Hours Worked ('000) by Ethnic Group

| NZSIC industry | % hours worked in 2001 by each ethnic group | | | | | Total |
|--|---|-------|---------|-------|-------|-------|
| | European | Maori | Pacific | Asian | Other | |
| 311 Food Manufacturing | 69.2 | 22.0 | 5.9 | 2.6 | 0.3 | 100 |
| 312 Food Manufacturing | 64.1 | 17.9 | 11.5 | 6.1 | 0.4 | 100 |
| 313 Beverages | 77.3 | 11.1 | 7.9 | 3.1 | 0.6 | 100 |
| 314 Tobacco | 77.3 | 15.7 | 3.5 | 3.5 | 0.0 | 100 |
| 321 Textiles | 73.2 | 9.8 | 10.0 | 6.6 | 0.4 | 100 |
| 322 Clothing (ex footwear) | 67.0 | 8.5 | 8.5 | 15.7 | 0.3 | 100 |
| 323 Leather, Products, Substitutes & Fur | 72.2 | 18.6 | 6.2 | 2.8 | 0.3 | 100 |
| 324 Footwear | 57.8 | 10.4 | 22.5 | 9.2 | 0.0 | 100 |
| 331 Wood and Wood Products | 73.7 | 20.5 | 4.3 | 1.4 | 0.1 | 100 |
| 332 Furniture and Fixtures | 77.7 | 7.4 | 9.4 | 5.3 | 0.2 | 100 |
| 341 Paper and Paper Products | 63.3 | 21.6 | 11.7 | 3.3 | 0.1 | 100 |
| 342 Printing, Publishing and Allied Industries | 85.3 | 6.1 | 4.4 | 3.9 | 0.3 | 100 |
| 351 Industrial Chemicals | 76.3 | 10.0 | 7.6 | 5.9 | 0.2 | 100 |
| 352 Other Chemical Products | 73.0 | 9.6 | 8.9 | 8.3 | 0.2 | 100 |
| 353 Petroleum Refineries | 93.5 | 6.5 | 0.0 | 0.0 | 0.0 | 100 |
| 354 Products of Petroleum and Coal | 84.2 | 10.5 | 4.1 | 1.3 | 0.0 | 100 |
| 355 Rubber Products | 74.9 | 12.3 | 8.1 | 4.5 | 0.2 | 100 |
| 356 Plastic Products nec | 66.1 | 9.7 | 14.7 | 8.7 | 0.7 | 100 |
| 361 Pottery, China and Earthenware | 86.1 | 7.2 | 3.5 | 2.9 | 0.3 | 100 |
| 362 Glass and Glass Products | 69.6 | 12.3 | 14.0 | 3.8 | 0.3 | 100 |
| 369 Other Non-Metallic Mineral Products | 76.1 | 14.9 | 7.0 | 1.7 | 0.3 | 100 |
| 371 Iron and Steel Basic Industries | 74.2 | 13.3 | 9.0 | 3.3 | 0.1 | 100 |
| 372 Non-Ferrous Metal Basic Industries | 72.9 | 11.2 | 12.3 | 3.4 | 0.1 | 100 |
| 381 Fabricated Metal Products | 76.3 | 10.5 | 8.8 | 4.1 | 0.3 | 100 |
| 382 Machinery (ex electrical) | 85.4 | 7.7 | 3.7 | 2.8 | 0.4 | 100 |
| 383 Electrical Machinery | 72.5 | 8.2 | 9.2 | 9.4 | 0.6 | 100 |
| 384 Transport Equipment | 85.9 | 7.7 | 3.8 | 2.1 | 0.5 | 100 |
| 385 Prof, Scientific & Optical Goods | 77.1 | 6.7 | 4.7 | 10.0 | 1.5 | 100 |
| 390 Other Manufacturing Industries | 79.5 | 8.1 | 7.3 | 4.8 | 0.3 | 100 |
| ALL MANUFACTURING | 74.8 | 13.0 | 7.3 | 4.5 | 0.3 | 100 |
| ALL ECONOMY | 80.0 | 10.6 | 4.1 | 4.9 | 0.4 | 100 |

Table 2.12



Change in Composition of Manufacturing Hours Worked by Ethnic Group: 1986-2001

| NZSIC industry | % hours worked 1986-2001 by each ethnic group | | | | | Total |
|--|---|-------|---------|-------|-------|-------|
| | European | Maori | Pacific | Asian | Other | |
| 311 Food Manufacturing | -5.3 | 2.7 | 1.0 | 1.5 | 0.2 | 0.0 |
| 312 Food Manufacturing | -10.7 | 4.2 | 1.9 | 4.3 | 0.3 | 0.0 |
| 313 Beverages | -4.8 | 0.3 | 1.9 | 2.1 | 0.4 | 0.0 |
| 314 Tobacco | 1.7 | -0.1 | -3.1 | 2.2 | -0.7 | 0.0 |
| 321 Textiles | -1.5 | -2.4 | -0.8 | 4.4 | 0.3 | 0.0 |
| 322 Clothing (ex footwear) | -7.2 | -5.4 | -0.3 | 12.8 | 0.2 | 0.0 |
| 323 Leather, Products, Substitutes & Fur | -6.6 | 7.2 | -1.7 | 0.9 | 0.2 | 0.0 |
| 324 Footwear | -10.6 | -3.5 | 7.7 | 6.6 | -0.1 | 0.0 |
| 331 Wood and Wood Products | -1.1 | 0.9 | -0.6 | 0.7 | 0.1 | 0.0 |
| 332 Furniture and Fixtures | -5.2 | -0.4 | 1.8 | 3.8 | 0.0 | 0.0 |
| 341 Paper and Paper Products | -7.6 | 3.1 | 2.7 | 1.7 | 0.1 | 0.0 |
| 342 Printing, Publishing and Allied Industries | -4.1 | 0.2 | 1.1 | 2.7 | 0.1 | 0.0 |
| 351 Industrial Chemicals | -3.2 | -0.7 | 0.2 | 3.6 | 0.1 | 0.0 |
| 352 Other Chemical Products | -7.8 | -0.7 | 2.4 | 5.9 | 0.1 | 0.0 |
| 353 Petroleum Refineries | 8.7 | -5.6 | -1.7 | -1.1 | -0.3 | 0.0 |
| 354 Products of Petroleum and Coal | 4.8 | 1.8 | -7.3 | 0.7 | 0.0 | 0.0 |
| 355 Rubber Products | -6.2 | 1.1 | 1.7 | 3.6 | -0.1 | 0.0 |
| 356 Plastic Products nec | -7.9 | -1.0 | 3.0 | 5.3 | 0.6 | 0.0 |
| 361 Pottery, China and Earthenware | 1.5 | -0.5 | -3.5 | 2.2 | 0.3 | 0.0 |
| 362 Glass and Glass Products | -6.0 | 0.0 | 3.4 | 2.3 | 0.3 | 0.0 |
| 369 Other Non-Metallic Mineral Products | -1.2 | -0.7 | 0.6 | 1.2 | 0.1 | 0.0 |
| 371 Iron and Steel Basic Industries | 0.0 | -1.5 | 0.5 | 1.0 | 0.0 | 0.0 |
| 372 Non-Ferrous Metal Basic Industries | -5.2 | -0.3 | 3.3 | 2.1 | 0.0 | 0.0 |
| 381 Fabricated Metal Products | -0.9 | -0.2 | -1.1 | 2.0 | 0.2 | 0.0 |
| 382 Machinery (ex electrical) | -2.3 | 0.5 | 0.0 | 1.5 | 0.3 | 0.0 |
| 383 Electrical Machinery | -2.5 | -1.8 | -2.1 | 5.9 | 0.4 | 0.0 |
| 384 Transport Equipment | 9.1 | -3.6 | -5.9 | 0.0 | 0.4 | 0.0 |
| 385 Prof, Scientific & Optical Goods | -4.0 | -3.0 | -2.0 | 7.6 | 1.5 | 0.0 |
| 390 Other Manufacturing Industries | -4.3 | 0.5 | 1.5 | 2.3 | 0.0 | 0.0 |
| ALL MANUFACTURING | -2.9 | -0.2 | 0.0 | 2.8 | 0.2 | 0.0 |
| ALL ECONOMY | -5.7 | 1.1 | 1.0 | 3.4 | 0.3 | 0.0 |

Table 2.13



Changes in Hours Worked by Ethnicity v Tariff Changes

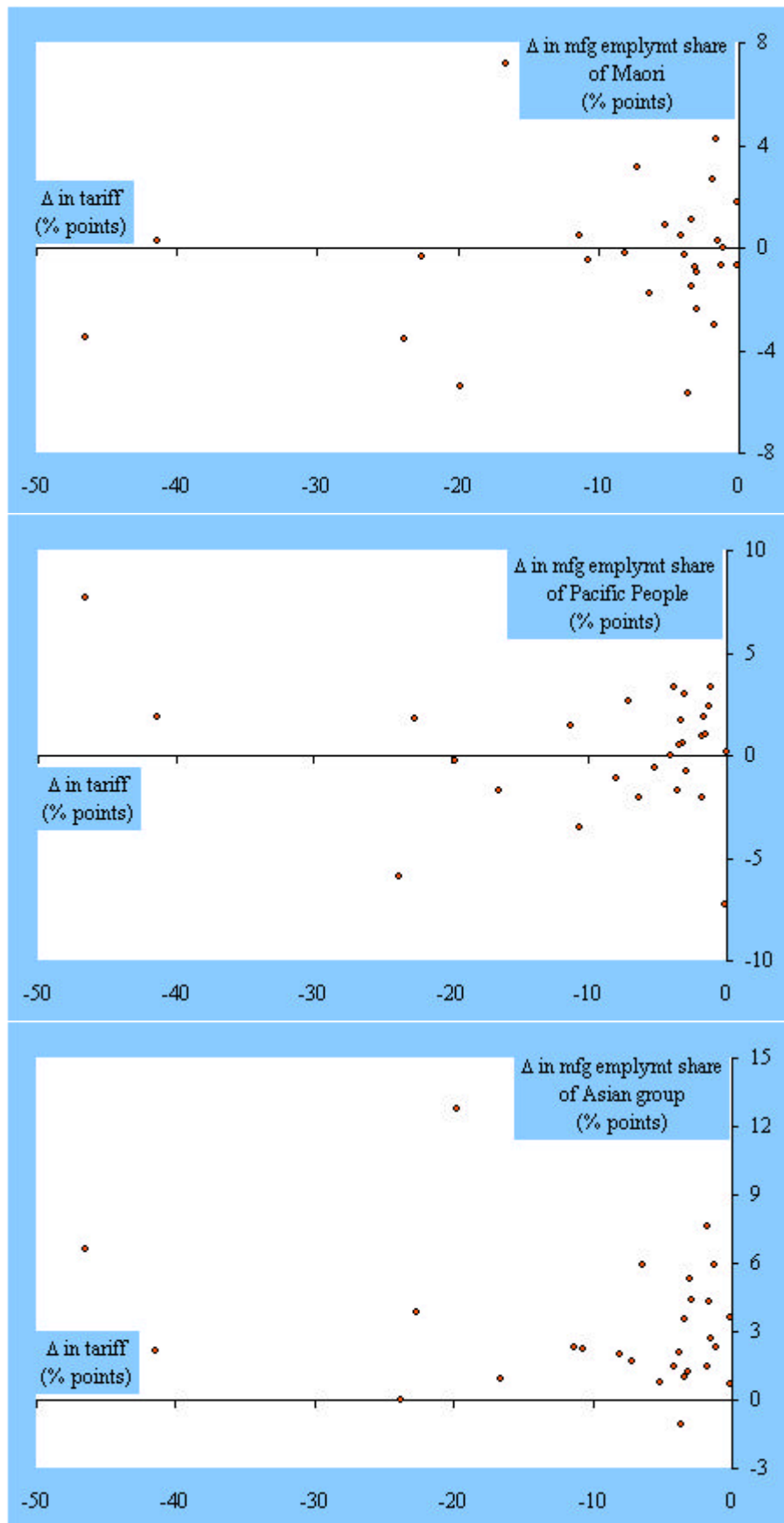


Figure 2.15



Note that the above pictures, as before, exclude tobacco and alcohol.

Calculating shares across the other dimension - ie the importance of each industry within manufacturing by each ethnic group - does not add much. Listed in *Table 2.14* below are the percentage-point changes in these shares between 1986 and 2001. Looking at the ethnic-specific changes provides little evidence that one particular ethnic group has shifted predominantly more than any other. The industry worthy of note - 322 clothing ex footwear - shows a reduction in importance being recorded across all ethnic groupings, with the noticeable exception of the Asian group. For both textiles and footwear the reductions are spread across all ethnic groups.

Change in Industry Share of Manufacturing Hours Worked by Ethnic Group: 1986-2001

| NZSIC industry | % hours worked 1986-2001 by each ethnic group | | | | | Total |
|--|---|-------|---------|-------|-------|-------|
| | European | Maori | Pacific | Asian | Other | |
| 311 Food Manufacturing | -3.4 | -0.5 | 0.3 | -3.0 | -1.3 | -3.0 |
| 312 Food Manufacturing | 3.2 | 5.7 | 6.4 | 5.6 | 4.8 | 3.9 |
| 313 Beverages | 0.5 | 0.5 | 0.9 | 0.6 | 1.5 | 0.6 |
| 314 Tobacco | -0.2 | -0.2 | -0.2 | -0.1 | -1.7 | -0.2 |
| 321 Textiles | -1.0 | -1.7 | -2.1 | -0.6 | -0.2 | -1.1 |
| 322 Clothing (ex footwear) | -3.1 | -4.5 | -3.8 | 1.1 | -3.9 | -3.0 |
| 323 Leather, Products, Substitutes & Fur | 0.2 | 0.9 | -0.1 | -0.4 | 0.3 | 0.2 |
| 324 Footwear | -0.9 | -1.1 | -1.7 | -1.3 | -1.6 | -1.0 |
| 331 Wood and Wood Products | 2.3 | 3.9 | 0.8 | 0.2 | 1.6 | 2.2 |
| 332 Furniture and Fixtures | 1.4 | 0.8 | 2.5 | 2.5 | -1.8 | 1.4 |
| 341 Paper and Paper Products | -1.6 | -1.4 | -0.9 | -1.8 | -0.9 | -1.5 |
| 342 Printing, Publishing and Allied Industries | 2.4 | 1.2 | 2.3 | 3.1 | -1.1 | 2.1 |
| 351 Industrial Chemicals | -0.1 | -0.1 | 0.0 | -0.1 | 0.0 | -0.1 |
| 352 Other Chemical Products | -0.4 | -0.3 | 0.5 | 0.6 | -0.8 | -0.3 |
| 353 Petroleum Refineries | -0.6 | -0.6 | -0.2 | -0.4 | -1.7 | -0.6 |
| 354 Products of Petroleum and Coal | 0.0 | 0.0 | -0.2 | 0.0 | 0.0 | 0.0 |
| 355 Rubber Products | -0.6 | -0.4 | -0.3 | 0.0 | -2.9 | -0.5 |
| 356 Plastic Products nec | 0.7 | 0.6 | 3.0 | 1.8 | 5.1 | 1.0 |
| 361 Pottery, China and Earthenware | -0.1 | -0.1 | -0.3 | 0.1 | 0.4 | -0.1 |
| 362 Glass and Glass Products | -0.4 | -0.3 | -0.3 | -0.3 | 0.4 | -0.4 |
| 369 Other Non-Metallic Mineral Products | -0.2 | -0.3 | 0.0 | 0.1 | -1.8 | -0.2 |
| 371 Iron and Steel Basic Industries | -0.2 | -0.4 | -0.2 | -1.0 | -0.4 | -0.2 |
| 372 Non-Ferrous Metal Basic Industries | 0.2 | 0.2 | 0.9 | 0.2 | -0.3 | 0.2 |
| 381 Fabricated Metal Products | 0.4 | 0.1 | -1.1 | -2.3 | -0.6 | 0.2 |
| 382 Machinery (ex electrical) | 1.1 | 0.8 | 0.4 | -0.5 | 3.6 | 0.9 |
| 383 Electrical Machinery | 0.0 | -0.6 | -1.4 | 0.4 | 2.5 | 0.0 |
| 384 Transport Equipment | -0.8 | -2.7 | -6.2 | -5.5 | -1.5 | -1.6 |
| 385 Prof, Scientific & Optical Goods | 0.3 | 0.1 | 0.1 | 1.1 | 3.4 | 0.3 |
| 390 Other Manufacturing Industries | 0.7 | 0.5 | 1.0 | 0.2 | -1.5 | 0.7 |
| ALL MANUFACTURING | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ALL ECONOMY | -5.7 | 1.1 | 1.0 | 3.4 | 0.3 | 0.0 |

Table 2.14



2.5 Manufacturing employment by gender

Weekly Hours Worked in Manufacturing (000s)

| Total Economy | 1986 | 1991 | 1996 | 2001 |
|--------------------------|--------|--------|--------|--------|
| Males | 41,346 | 36,865 | 40,940 | 42,499 |
| Females | 21,741 | 21,434 | 25,426 | 28,030 |
| All | 63,087 | 58,299 | 66,366 | 70,529 |
| % Females | 34.5% | 36.8% | 38.3% | 39.7% |
| Males in Manufacturing | 9,878 | 7,355 | 7,509 | 7,288 |
| Females in Manufacturing | 3,665 | 2,624 | 2,657 | 2,505 |
| All Manufacturing | 13,543 | 9,979 | 10,166 | 9,794 |
| % Females | 27.1% | 26.3% | 26.1% | 25.6% |

Table 2.15

The gender composition of manufacturing employment has changed only marginally over the 15 year period, with female hours worked accounting for a slightly lower proportion of total manufacturing hours worked in 2001 than in 1986. (ie 25.6% - down from 27.1%).

This is in contrast to the shift at the total economy level where the proportion of female hours worked has risen substantially to nearly 40% in 2001, from under 35% 15 years earlier.

The detail of hours worked by gender within each manufacturing industry follows in *Table 2.16*.



Manufacturing Hours Worked (000s) by Gender by Industry

| NZSIC industry | Hours worked males | | | | Hours worked females | | | |
|--|--------------------|---------------|---------------|---------------|----------------------|---------------|---------------|---------------|
| | 1986 | 1991 | 1996 | 2001 | 1986 | 1991 | 1996 | 2001 |
| 311 Food manufacturing | 2122.5 | 1701.2 | 1255.0 | 1244.2 | 616.8 | 558.1 | 396.3 | 440.2 |
| 312 Food manufacturing | 99.5 | 103.5 | 283.1 | 290.7 | 56.2 | 63.8 | 189.8 | 201.4 |
| 313 Beverages | 135.6 | 105.0 | 103.3 | 115.4 | 36.2 | 34.7 | 42.7 | 62.9 |
| 314 Tobacco | 21.8 | 14.2 | 10.4 | 7.1 | 15.8 | 9.5 | 7.6 | 4.0 |
| 321 Textiles | 356.3 | 227.4 | 227.2 | 200.7 | 305.6 | 185.8 | 191.0 | 167.3 |
| 322 Clothing (ex footwear) | 146.0 | 106.1 | 96.2 | 76.9 | 720.4 | 478.0 | 380.9 | 257.8 |
| 323 Leather, Products, Substitues & Fur (ex ftwr & clthg) | 80.4 | 74.5 | 90.4 | 94.2 | 60.0 | 30.8 | 32.9 | 29.1 |
| 324 Footwear | 75.3 | 36.0 | 26.8 | 13.9 | 100.6 | 43.4 | 31.5 | 15.1 |
| 331 Wood and wood products | 726.6 | 576.9 | 661.4 | 696.6 | 84.6 | 69.7 | 80.2 | 99.7 |
| 332 Furniture and Fixtures | 301.2 | 252.5 | 341.9 | 336.6 | 70.2 | 52.9 | 74.5 | 71.6 |
| 341 Paper and paper products | 483.3 | 346.5 | 279.3 | 226.9 | 103.3 | 63.4 | 61.7 | 46.7 |
| 342 Printing, Publishing and Allied Industries | 570.7 | 493.2 | 549.4 | 510.3 | 334.6 | 289.6 | 360.4 | 354.9 |
| 351 Industrial Chemicals | 196.7 | 146.3 | 139.6 | 138.4 | 44.0 | 34.3 | 31.6 | 31.7 |
| 352 Other Chemical Products | 198.9 | 125.3 | 149.2 | 128.9 | 120.8 | 83.4 | 96.0 | 77.7 |
| 353 Petroleum Refineries | 76.7 | 38.8 | 25.3 | 8.0 | 10.5 | 4.6 | 3.4 | 0.9 |
| 354 Miscellaneous Products of Petroleum and Coal | 18.7 | 10.7 | 17.9 | 10.9 | 3.8 | 2.0 | 2.8 | 1.8 |
| 355 Rubber Products | 128.5 | 75.5 | 62.0 | 54.1 | 32.8 | 14.8 | 11.2 | 9.3 |
| 356 Plastic Products nec | 236.1 | 214.9 | 247.4 | 254.6 | 92.0 | 69.3 | 79.6 | 78.9 |
| 361 Pottery, China and Earthenware | 38.0 | 21.2 | 32.9 | 24.1 | 29.8 | 16.4 | 23.0 | 17.5 |
| 362 Glass and Glass Products | 98.6 | 56.3 | 41.1 | 38.2 | 17.5 | 10.1 | 9.8 | 9.8 |
| 369 Other Non-Metallic Mineral Products | 267.2 | 167.1 | 157.8 | 173.0 | 27.8 | 16.9 | 16.4 | 18.3 |
| 371 Iron and Steel Basic Industries | 179.0 | 146.6 | 133.0 | 112.6 | 20.2 | 14.6 | 11.9 | 8.9 |
| 372 Non-Ferrous Basic Metal Industries | 128.7 | 125.1 | 116.1 | 112.5 | 13.9 | 15.4 | 15.7 | 14.2 |
| 381 Fabricated Metal Products (ex machy and eqpmt) | 1022.3 | 700.4 | 766.1 | 774.2 | 180.8 | 121.0 | 117.5 | 115.9 |
| 382 Machinery (ex electrical) | 814.5 | 623.1 | 692.2 | 672.7 | 110.9 | 80.2 | 88.0 | 88.2 |
| 383 Electrical Machinery | 424.0 | 280.1 | 343.2 | 338.7 | 233.0 | 121.4 | 138.6 | 137.6 |
| 384 Transport Equipment | 772.2 | 428.3 | 482.7 | 432.8 | 116.0 | 63.0 | 79.7 | 52.3 |
| 385 Prof, Scientific, Measuring eqpmt nec; Photo & Optical | 34.0 | 17.0 | 36.6 | 50.4 | 27.2 | 9.4 | 20.1 | 26.3 |
| 390 Other Manufacturing Industries | 124.4 | 141.1 | 141.4 | 150.9 | 79.9 | 67.7 | 62.6 | 65.4 |
| ALL MANUFACTURING | 9877.7 | 7354.8 | 7509.0 | 7288.5 | 3665.2 | 2624.2 | 2657.1 | 2505.2 |

Table 2.16



In percentage terms the largest declines in female hours worked are recorded in petroleum (down 91.7%, but probable classification problems there); footwear (down 85%); tobacco (down 74.5%); rubber (down 71.6%); clothing excl footwear (down 64.2%); iron and basic steel (down 55.9%); with transport equipment, paper and paper products and leather also all recording greater than 50% falls.

Change in Female Hours Worked and Tariff by Industry (ex outliers) 1986-2001

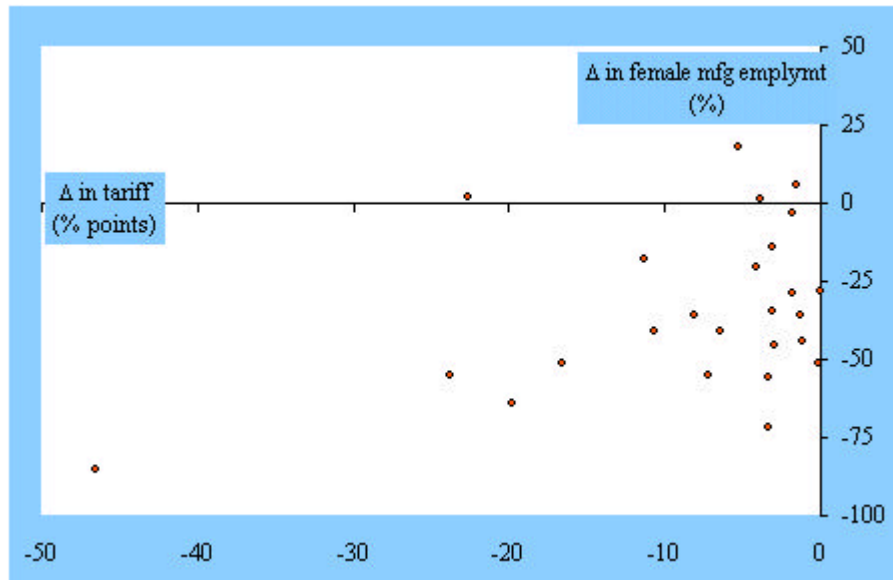


Figure 2.16

As previously found however, the large employment reductions are not clearly related to industry tariff changes. The scatter of female employment changes to tariff changes *Figure 2.16* shows little relationship. Note that, as previously, large outliers attributable to spurious data (as in tobacco) and/or classification complications (as in chemicals and petroleum) are not included in *Figure 2.16*.

To allow for the overall decline in manufacturing hours worked, the share of female hours worked in each industry is also provided in *Table 2.17*.



Female Share of Manufacturing Hours Worked (000s) by Industry

| NZSIC industry | Hours worked % female | | | |
|--|-----------------------|--------------|--------------|--------------|
| | 1986 | 1991 | 1996 | 2001 |
| 311 Food manufacturing | 22.5% | 24.7% | 24.0% | 26.1% |
| 312 Food manufacturing | 36.1% | 38.1% | 40.1% | 40.9% |
| 313 Beverages | 21.1% | 24.8% | 29.2% | 35.3% |
| 314 Tobacco | 42.0% | 39.9% | 42.1% | 36.2% |
| 321 Textiles | 46.2% | 45.0% | 45.7% | 45.5% |
| 322 Clothing (ex footwear) | 83.1% | 81.8% | 79.8% | 77.0% |
| 323 Leather, Products, Substitues & Fur (ex ftwr & clthg) | 42.8% | 29.2% | 26.6% | 23.6% |
| 324 Footwear | 57.2% | 54.7% | 54.0% | 52.1% |
| 331 Wood and wood products | 10.4% | 10.8% | 10.8% | 12.5% |
| 332 Furniture and Fixtures | 18.9% | 17.3% | 17.9% | 17.5% |
| 341 Paper and paper products | 17.6% | 15.5% | 18.1% | 17.1% |
| 342 Printing, Publishing and Allied Industries | 37.0% | 37.0% | 39.6% | 41.0% |
| 351 Industrial Chemicals | 18.3% | 19.0% | 18.4% | 18.6% |
| 352 Other Chemical Products | 37.8% | 40.0% | 39.1% | 37.6% |
| 353 Petroleum Refineries | 12.1% | 10.7% | 11.9% | 9.9% |
| 354 Miscellaneous Products of Petroleum and Coal | 16.7% | 16.1% | 13.4% | 14.4% |
| 355 Rubber Products | 20.3% | 16.4% | 15.3% | 14.7% |
| 356 Plastic Products nec | 28.0% | 24.4% | 24.3% | 23.7% |
| 361 Pottery, China and Earthenware | 43.9% | 43.6% | 41.2% | 42.1% |
| 362 Glass and Glass Products | 15.1% | 15.2% | 19.2% | 20.4% |
| 369 Other Non-Metallic Mineral Products | 9.4% | 9.2% | 9.4% | 9.6% |
| 371 Iron and Steel Basic Industries | 10.1% | 9.1% | 8.2% | 7.3% |
| 372 Non-Ferrous Basic Metal Industries | 9.8% | 10.9% | 11.9% | 11.2% |
| 381 Fabricated Metal Products (ex machy and eqpmt) | 15.0% | 14.7% | 13.3% | 13.0% |
| 382 Machinery (ex electrical) | 12.0% | 11.4% | 11.3% | 11.6% |
| 383 Electrical Machinery | 35.5% | 30.2% | 28.8% | 28.9% |
| 384 Transport Equipment | 13.1% | 12.8% | 14.2% | 10.8% |
| 385 Prof, Scientific, Measuring eqpmt nec; Photo & Optical | 44.5% | 35.7% | 35.5% | 34.3% |
| 390 Other Manufacturing Industries | 39.1% | 32.4% | 30.7% | 30.2% |
| ALL MANUFACTURING | 27.1% | 26.3% | 26.1% | 25.6% |

Table 2.17

This shows, largest (percentage-point) declines in the female share of hours worked were recorded in leather (down nearly 20%-points); prof, scientific etc (down over 10%-points); other manufacturing (down nearly 9%-points); electrical machinery (down 6.6%-points) followed by clothing excluding footwear (down 6.1%-points).

Again though, any relationship between these changes and industry tariff changes was difficult to establish - *Figure 2.17*.



Change in Female Share of Mfg Hours Worked and Tariff by Industry (ex outliers) 1986-2001

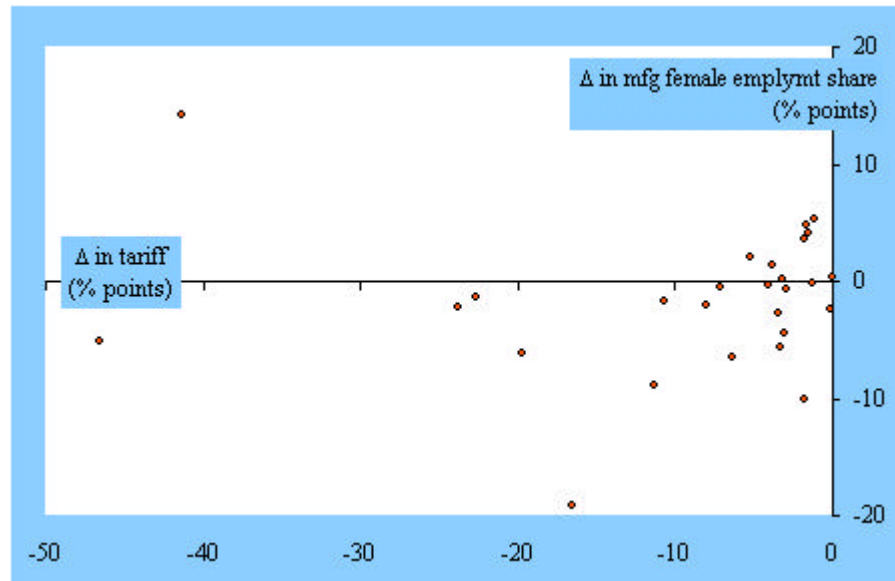


Figure 2.17

2.6 Manufacturing employment by household type

As shown in *Table 2.18* the 7.0% percentage-point reduction in the relative size of manufacturing (as measured by average hours worked) is reflected across all household types with the exception of the (extremely small) couples aged 65+ with children category. While the 9.5 percentage-point reduction in the solo parents (aged <65) with children group is most noticeable, this was also a 'small' group in terms of employment hours worked. The two largest household groups (couples only, at least one aged <65; and couples, at least one aged <65, with children) on the other hand experienced percentage-point reductions fairly much in line with the overall picture for manufacturing as a whole.

However, the story for these two household type categories provides an interesting contrast. While the importance of couples (one <65) with children has declined by about 6.6%-points, this occurred as a result of an absolute fall of the order of 35% in hours worked in manufacturing by this household type - compared to a more moderate 5% fall in hours worked across the whole economy by this household type. In contrast, the importance of couples only (one <65) declined by about 7%-points as a result of hours worked in manufacturing by this group remaining fairly stable - compared to a surging 60% rise in hours worked across the whole economy by this latter group.

The similar relativities in importance of these two main groups are depicted in the following figures - where the reductions between 1986 and 2001 can be seen to be noticeably close to that of the overall average for total manufacturing. Furthermore, the decline in the solo parent household type hours worked in manufacturing compared to hours worked elsewhere is also noticeable - although, as stated earlier, this was a 'small' category in terms of overall hours worked.



Average Weekly Hours Worked by Household Type ('000)

| | 1986 | 1991 | 1996 | 2001 | % point change | |
|--|---------------|---------------|---------------|---------------|----------------|-------------|
| | | | | | 86-01 | 91-01 |
| Total Economy | | | | | | |
| single person hhd aged <65 | 3,291 | 3,470 | 4,072 | 5,347 | | |
| single person hhd aged 65+ | 112 | 114 | 171 | 270 | | |
| couple aged 65+ with children | 9 | 39 | 26 | 65 | | |
| couple only aged 65+ | 60 | 246 | 170 | 557 | | |
| sole parents aged <65 with children | 1,684 | 1,815 | 2,291 | 3,071 | | |
| couple only (one aged <65 with children) | 11,653 | 13,066 | 16,868 | 18,721 | | |
| couple (one aged <65 with children) | 26,975 | 24,647 | 25,824 | 25,618 | | |
| other | 302 | 32 | 365 | 61 | | |
| All households | 44,085 | 43,428 | 49,787 | 53,709 | | |
| Manufacturing | | | | | | |
| single person hhd aged <65 | 647 | 570 | 620 | 755 | | |
| single person hhd aged 65+ | 16 | 9 | 12 | 20 | | |
| couple aged 65+ with children | 0 | 2 | 1 | 4 | | |
| couple only aged 65+ | 6 | 20 | 12 | 39 | | |
| sole parents aged <65 with children | 360 | 289 | 315 | 365 | | |
| couple only (one aged <65 with children) | 2,367 | 2,100 | 2,503 | 2,491 | | |
| couple (one aged <65 with children) | 5,824 | 4,317 | 4,185 | 3,828 | | |
| other | 42 | 3 | 32 | 5 | | |
| All households | 9,263 | 7,310 | 7,681 | 7,509 | | |
| % of Manufacturing in Total Economy | | | | | | |
| single person hhd aged <65 | 19.7 | 16.4 | 15.2 | 14.1 | -5.5 | -2.3 |
| single person hhd aged 65+ | 14.0 | 8.2 | 7.3 | 7.6 | -6.4 | -0.6 |
| couple aged 65+ with children | 3.9 | 5.6 | 3.8 | 6.7 | 2.8 | 1.1 |
| couple only aged 65+ | 10.8 | 7.9 | 7.3 | 7.0 | -3.8 | -1.0 |
| sole parents aged <65 with children | 21.4 | 16.0 | 13.8 | 11.9 | -9.5 | -4.1 |
| couple only (one aged <65 with children) | 20.3 | 16.1 | 14.8 | 13.3 | -7.0 | -2.8 |
| couple (one aged <65 with children) | 21.6 | 17.5 | 16.2 | 14.9 | -6.6 | -2.6 |
| other | 13.8 | 9.8 | 8.8 | 8.9 | -4.9 | -0.9 |
| All households | 21.0 | 16.8 | 15.4 | 14.0 | -7.0 | -2.9 |

Table 2.18



Hours Worked in Manufacturing as a % of All Hours Worked by Household Type - 1986

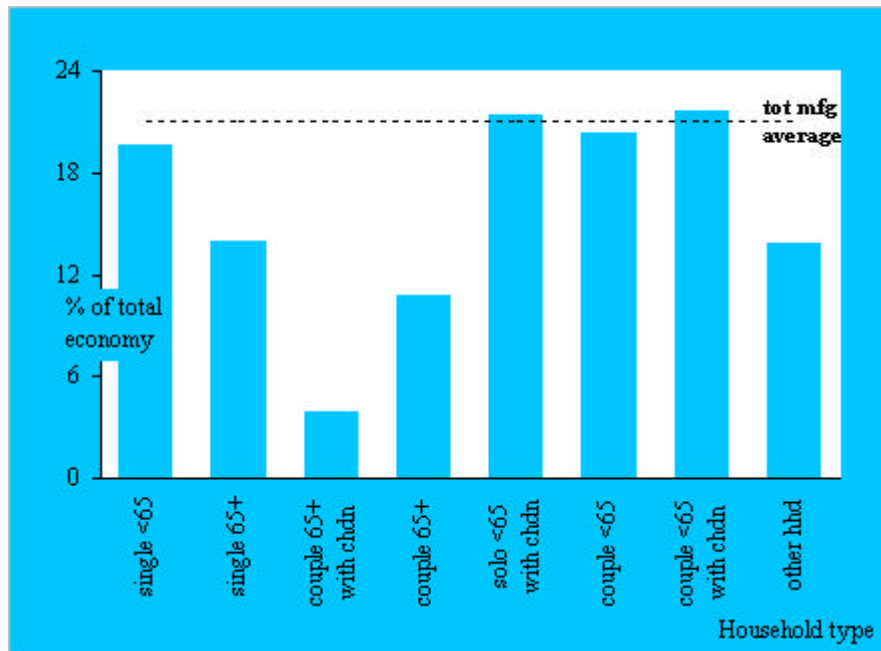


Figure 2.18

Hours Worked in Manufacturing as a % of All Hours Worked by Household Type – 2001

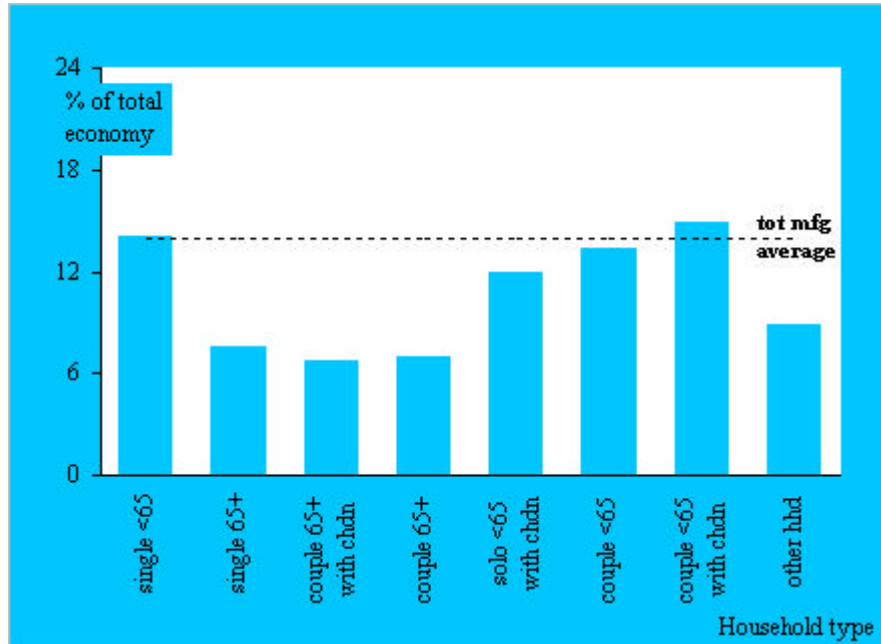


Figure 2.19

The 2001 composition (by household type) of the hours worked within each manufacturing industry is provided in *Table 2.19*, with the change in this composition since 1986 listed in *Table 2.20*.



In terms of the share of each household type in overall manufacturing hours worked, the above table shows by far the largest decline between 1986 and 2001 being recorded in the couple (one <65) with children group - with the largest rise in the couple only (one <65) group.

Furthermore, there appear to be few noticeable differences amongst the individual industries - with the picture for overall manufacturing itself being a mirror of the movements recorded for the total economy. In addition, as for the analysis in other characteristics, there is little to relate the movements across the industries to tariff changes experienced by those industries over the 1986 to 2001 period - as shown for the main household types in the charts in *Figure 2.20* below. Again tobacco and alcohol have been excluded.

Calculating shares across the other dimension - ie the importance of each industry within manufacturing by each household type - sheds little light. Listed in *Table 2.21* below are the percentage-point changes in these shares between 1986 and 2001. The biggest industry mover - 311 food manufacturing - illustrates the changes as spread across all household types, with the couple only 65+ category falling the greatest. Another industry worthy of note - 322 clothing ex footwear - indicates declines across all household types with the exception of the couple 65+ with children (although caution when investigating this category given the small numbers involved).



Composition of Manufacturing Hours Worked ('000) by Household Type

| NZSIC industry | % hours worked in 2001 accounted for by each household type | | | | | | | | Total |
|--|---|------------|----------------------|----------------------|--------------------|------------|----------------------|-----------|-------|
| | single <65 | single 65+ | couple 65+ with chdn | couple 65+ with chdn | solo <65 with chdn | couple <65 | couple <65 with chdn | other hhd | |
| 311 Food Manufacturing | 11.4 | 0.1 | 0.0 | 0.2 | 5.9 | 31.4 | 50.9 | 0.0 | 100 |
| 312 Food Manufacturing | 9.7 | 0.2 | 0.0 | 0.5 | 7.0 | 33.1 | 49.4 | 0.1 | 100 |
| 313 Beverages | 10.1 | 0.4 | 0.0 | 0.6 | 4.7 | 36.0 | 48.1 | 0.0 | 100 |
| 314 Tobacco | 11.2 | 0.0 | 0.0 | 0.0 | 5.1 | 41.3 | 42.4 | 0.0 | 100 |
| 321 Textiles | 10.1 | 0.7 | 0.0 | 0.8 | 6.0 | 34.7 | 47.7 | 0.1 | 100 |
| 322 Clothing (ex footwear) | 9.0 | 0.9 | 0.2 | 0.6 | 7.8 | 37.8 | 43.6 | 0.1 | 100 |
| 323 Leather, Products, Substitutes & Fur | 11.7 | 0.2 | 0.0 | 0.3 | 5.7 | 32.3 | 49.8 | 0.0 | 100 |
| 324 Footwear | 8.1 | 0.8 | 0.0 | 1.1 | 7.5 | 33.8 | 47.5 | 1.2 | 100 |
| 331 Wood and Wood Products | 10.5 | 0.2 | 0.1 | 0.5 | 4.0 | 31.8 | 52.8 | 0.1 | 100 |
| 332 Furniture and Fixtures | 9.7 | 0.2 | 0.1 | 0.7 | 4.1 | 32.0 | 53.1 | 0.0 | 100 |
| 341 Paper and Paper Products | 9.4 | 0.1 | 0.1 | 0.3 | 5.0 | 29.9 | 55.1 | 0.1 | 100 |
| 342 Printing, Publishing and Allied Industries | 10.9 | 0.4 | 0.1 | 0.7 | 5.7 | 36.7 | 45.5 | 0.1 | 100 |
| 351 Industrial Chemicals | 8.9 | 0.1 | 0.0 | 0.6 | 4.1 | 31.7 | 54.6 | 0.0 | 100 |
| 352 Other Chemical Products | 9.2 | 0.2 | 0.0 | 0.3 | 5.6 | 33.4 | 51.2 | 0.1 | 100 |
| 353 Petroleum Refineries | 7.1 | 0.0 | 0.0 | 0.0 | 1.5 | 31.0 | 60.3 | 0.0 | 100 |
| 354 Products of Petroleum and Coal | 9.9 | 0.0 | 0.0 | 0.0 | 2.8 | 33.9 | 53.4 | 0.0 | 100 |
| 355 Rubber Products | 10.9 | 0.4 | 0.0 | 0.6 | 2.5 | 32.1 | 53.5 | 0.0 | 100 |
| 356 Plastic Products nec | 8.9 | 0.3 | 0.0 | 0.5 | 4.4 | 30.4 | 55.3 | 0.1 | 100 |
| 361 Pottery, China and Earthenware | 10.5 | 0.9 | 0.0 | 1.5 | 4.5 | 41.2 | 41.5 | 0.0 | 100 |
| 362 Glass and Glass Products | 10.7 | 0.3 | 0.0 | 0.0 | 4.7 | 30.9 | 53.4 | 0.0 | 100 |
| 369 Other Non-Metallic Mineral Products | 9.0 | 0.2 | 0.0 | 0.7 | 3.7 | 35.8 | 50.6 | 0.0 | 100 |
| 371 Iron and Steel Basic Industries | 10.1 | 0.3 | 0.0 | 0.3 | 4.6 | 26.4 | 58.2 | 0.2 | 100 |
| 372 Non-Ferrous Metal Basic Industries | 8.8 | 0.1 | 0.0 | 0.0 | 4.2 | 28.8 | 58.0 | 0.1 | 100 |
| 381 Fabricated Metal Products | 8.8 | 0.3 | 0.1 | 0.6 | 3.7 | 32.9 | 53.5 | 0.1 | 100 |
| 382 Machinery (ex electrical) | 9.7 | 0.3 | 0.0 | 0.7 | 3.2 | 33.5 | 52.7 | 0.0 | 100 |
| 383 Electrical Machinery | 10.4 | 0.0 | 0.1 | 0.4 | 4.6 | 34.0 | 50.4 | 0.1 | 100 |
| 384 Transport Equipment | 9.4 | 0.2 | 0.1 | 0.4 | 3.2 | 34.6 | 52.0 | 0.1 | 100 |
| 385 Prof, Scientific & Optical Goods | 9.5 | 0.6 | 0.0 | 1.6 | 4.6 | 33.4 | 49.8 | 0.4 | 100 |
| 390 Other Manufacturing Industries | 10.2 | 0.3 | 0.1 | 1.4 | 3.7 | 35.4 | 48.6 | 0.3 | 100 |
| ALL MANUFACTURING | 10.1 | 0.3 | 0.1 | 0.5 | 4.9 | 33.2 | 51.0 | 0.1 | 100 |
| ALL ECONOMY | 10.0 | 0.5 | 0.1 | 1.0 | 5.7 | 34.9 | 47.7 | 0.1 | 100 |

Table 2.19



Change in Composition of Manufacturing Hours Worked ('000) by Household Type: 1986:2001

NZSIC industry

% hours worked in 2001 accounted for by each household type

| | % hours worked in 2001 accounted for by each household type | | | | | | | | Total |
|--|---|------------|----------------------|----------------------|--------------------|------------|----------------------|-----------|-------|
| | single <65 | single 65+ | couple 65+ with chdn | couple 65+ with chdn | solo <65 with chdn | couple <65 | couple <65 with chdn | other hhd | |
| 311 Food Manufacturing | 4.2 | 0.1 | 0.0 | 0.1 | 2.2 | 7.9 | -14.2 | -0.3 | 0.0 |
| 312 Food Manufacturing | 2.8 | 0.1 | 0.0 | 0.4 | 1.6 | 6.5 | -11.5 | 0.0 | 0.0 |
| 313 Beverages | 1.6 | 0.2 | 0.0 | 0.5 | 1.3 | 10.5 | -14.0 | -0.2 | 0.0 |
| 314 Tobacco | 5.5 | -0.2 | 0.0 | 0.0 | -2.2 | 13.8 | -16.4 | -0.5 | 0.0 |
| 321 Textiles | 3.5 | 0.4 | 0.0 | 0.7 | 0.8 | 8.7 | -13.8 | -0.3 | 0.0 |
| 322 Clothing (ex footwear) | 2.7 | 0.5 | 0.2 | 0.5 | 0.6 | 7.5 | -11.8 | -0.3 | 0.0 |
| 323 Leather, Products, Substitutes & Fur | 3.4 | 0.2 | 0.0 | 0.2 | 1.1 | 6.1 | -10.6 | -0.4 | 0.0 |
| 324 Footwear | 0.6 | 0.4 | 0.0 | 0.9 | 1.9 | 5.6 | -10.0 | 0.6 | 0.0 |
| 331 Wood and Wood Products | 3.6 | 0.1 | 0.1 | 0.4 | 1.6 | 7.8 | -13.1 | -0.5 | 0.0 |
| 332 Furniture and Fixtures | 3.4 | 0.1 | 0.1 | 0.7 | 0.9 | 6.1 | -10.6 | -0.7 | 0.0 |
| 341 Paper and Paper Products | 2.6 | 0.1 | 0.1 | 0.3 | 1.4 | 7.9 | -12.5 | 0.0 | 0.0 |
| 342 Printing, Publishing and Allied Industries | 2.3 | 0.1 | 0.1 | 0.5 | 1.2 | 8.2 | -11.7 | -0.6 | 0.0 |
| 351 Industrial Chemicals | 2.1 | 0.1 | 0.0 | 0.6 | 0.4 | 7.1 | -9.8 | -0.4 | 0.0 |
| 352 Other Chemical Products | 1.8 | 0.0 | 0.0 | 0.2 | 0.9 | 3.9 | -6.4 | -0.3 | 0.0 |
| 353 Petroleum Refineries | -1.6 | -0.3 | 0.0 | 0.0 | 0.0 | 8.3 | -6.5 | 0.0 | 0.0 |
| 354 Products of Petroleum and Coal | 2.1 | 0.0 | 0.0 | 0.0 | -0.2 | 8.0 | -9.1 | -0.8 | 0.0 |
| 355 Rubber Products | 3.8 | 0.4 | 0.0 | 0.6 | -1.0 | 8.1 | -11.4 | -0.6 | 0.0 |
| 356 Plastic Products nec | 2.5 | 0.2 | 0.0 | 0.4 | 0.3 | 4.3 | -7.2 | -0.5 | 0.0 |
| 361 Pottery, China and Earthenware | 4.8 | 0.2 | 0.0 | 1.5 | 0.6 | 16.0 | -22.8 | -0.2 | 0.0 |
| 362 Glass and Glass Products | 3.5 | 0.3 | 0.0 | 0.0 | 0.9 | 7.0 | -11.5 | -0.2 | 0.0 |
| 369 Other Non-Metallic Mineral Products | 3.2 | 0.0 | 0.0 | 0.7 | 0.5 | 11.3 | -15.2 | -0.4 | 0.0 |
| 371 Iron and Steel Basic Industries | 4.3 | 0.3 | 0.0 | 0.3 | 2.0 | 3.8 | -10.6 | -0.2 | 0.0 |
| 372 Non-Ferrous Metal Basic Industries | 2.3 | 0.0 | 0.0 | -0.1 | 1.3 | 7.3 | -10.7 | -0.1 | 0.0 |
| 381 Fabricated Metal Products | 2.3 | 0.2 | 0.0 | 0.5 | 0.8 | 7.8 | -11.0 | -0.6 | 0.0 |
| 382 Machinery (ex electrical) | 3.1 | 0.0 | 0.0 | 0.6 | 0.7 | 6.9 | -10.6 | -0.8 | 0.0 |
| 383 Electrical Machinery | 3.3 | -0.2 | 0.1 | 0.3 | 0.0 | 6.8 | -9.9 | -0.4 | 0.0 |
| 384 Transport Equipment | 2.2 | 0.0 | 0.1 | 0.4 | 0.2 | 8.5 | -11.0 | -0.3 | 0.0 |
| 385 Prof, Scientific & Optical Goods | 3.5 | 0.6 | 0.0 | 1.6 | -0.5 | 5.6 | -10.9 | 0.1 | 0.0 |
| 390 Other Manufacturing Industries | 2.9 | 0.0 | 0.1 | 1.1 | -1.5 | 7.3 | -9.3 | -0.6 | 0.0 |
| ALL MANUFACTURING | 3.1 | 0.1 | 0.1 | 0.4 | 1.0 | 7.6 | -11.9 | -0.4 | 0.0 |
| ALL ECONOMY | 2.5 | 0.2 | 0.1 | 0.9 | 1.9 | 8.4 | -13.5 | -0.6 | 0.0 |

Table 2.20



Changes in Hours Worked by Household Type v Tariff Changes

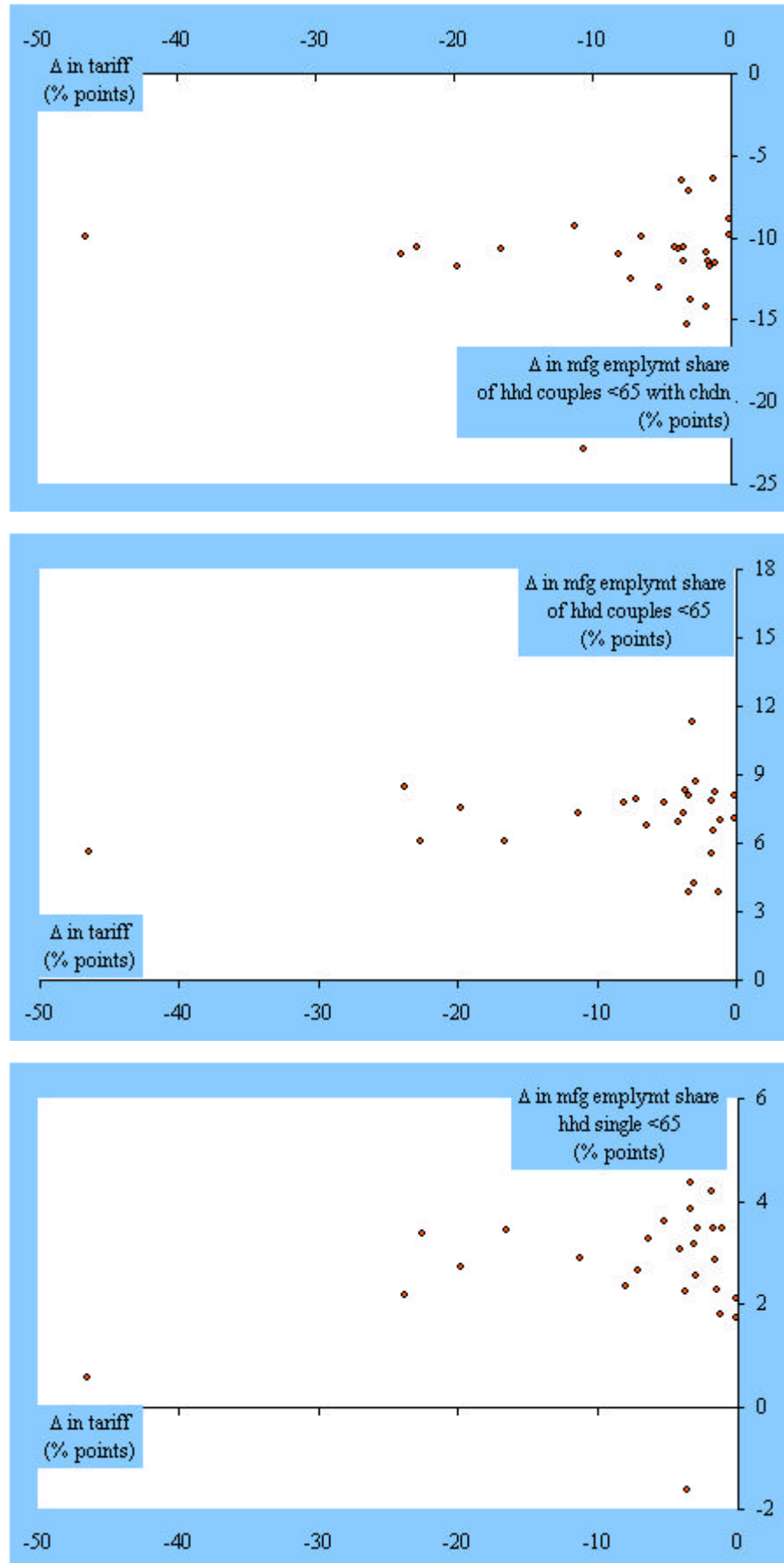


Figure 2.20



Change in Industry Share of Manufacturing Hours Worked ('000) by Household Type: 1986:2001

| NZSIC industry | % hours worked in 2001 accounted for by each household type | | | | | | | | Total |
|--|---|------------|----------------------|----------------------|--------------------|------------|----------------------|-----------|-------|
| | single <65 | single 65+ | couple 65+ with chdn | couple 65+ with chdn | solo <65 with chdn | couple <65 | couple <65 with chdn | other hhd | |
| 311 Food Manufacturing | -2.1 | -0.1 | 1.8 | -6.3 | 0.6 | -3.0 | -4.5 | -4.5 | -3.7 |
| 312 Food Manufacturing | 3.5 | 2.9 | 2.2 | 2.7 | 5.3 | 3.6 | 3.5 | 3.9 | 3.6 |
| 313 Beverages | 0.2 | 1.4 | 0.0 | 0.9 | 0.5 | 0.6 | 0.3 | 0.4 | 0.4 |
| 314 Tobacco | -0.1 | -0.4 | 0.0 | 0.0 | -0.4 | -0.2 | -0.2 | -0.3 | -0.2 |
| 321 Textiles | -0.9 | 1.7 | 1.2 | -2.5 | -1.9 | -1.1 | -1.3 | 2.2 | -1.2 |
| 322 Clothing (ex footwear) | -2.5 | -0.4 | 11.2 | -4.4 | -6.0 | -3.4 | -2.5 | -2.0 | -2.7 |
| 323 Leather, Products, Substitutes & Fur | 0.2 | 0.7 | 0.0 | -1.2 | 0.2 | 0.2 | 0.2 | -0.8 | 0.2 |
| 324 Footwear | -1.1 | -2.1 | 0.0 | -2.7 | -1.3 | -1.0 | -0.8 | 3.4 | -0.9 |
| 331 Wood and Wood Products | 2.6 | 1.9 | 9.4 | -2.1 | 3.0 | 2.2 | 2.2 | 0.5 | 2.2 |
| 332 Furniture and Fixtures | 1.6 | 1.1 | 8.5 | 5.5 | 1.3 | 1.4 | 1.7 | -1.6 | 1.5 |
| 341 Paper and Paper Products | -1.9 | 1.5 | 2.9 | 1.4 | -1.4 | -1.5 | -2.0 | 1.4 | -1.9 |
| 342 Printing, Publishing and Allied Industries | 1.6 | 0.0 | -49.0 | -7.0 | 3.0 | 2.6 | 2.1 | -0.3 | 2.4 |
| 351 Industrial Chemicals | -0.3 | 0.1 | 0.0 | 2.0 | -0.3 | -0.1 | 0.0 | -1.7 | -0.1 |
| 352 Other Chemical Products | -0.5 | -1.5 | 0.0 | 0.3 | -0.4 | -0.6 | 0.0 | 2.1 | -0.2 |
| 353 Petroleum Refineries | -0.8 | -1.1 | 0.0 | 0.0 | -0.2 | -0.5 | -0.6 | 0.0 | -0.6 |
| 354 Products of Petroleum and Coal | -0.1 | 0.0 | 0.0 | 0.0 | -0.1 | 0.0 | 0.0 | -0.3 | 0.0 |
| 355 Rubber Products | -0.6 | 0.9 | 0.0 | 0.8 | -0.8 | -0.6 | -0.6 | -1.6 | -0.6 |
| 356 Plastic Products nec | 0.8 | 1.8 | 2.2 | 1.1 | 0.5 | 0.7 | 1.3 | 2.9 | 1.0 |
| 361 Pottery, China and Earthenware | 0.0 | -0.8 | 0.0 | 1.3 | -0.2 | 0.0 | -0.2 | -0.2 | -0.1 |
| 362 Glass and Glass Products | -0.4 | 0.5 | 0.0 | 0.0 | -0.4 | -0.3 | -0.4 | -0.3 | -0.4 |
| 369 Other Non-Metallic Mineral Products | -0.1 | -0.7 | 0.9 | 2.6 | -0.3 | 0.0 | -0.4 | -2.1 | -0.2 |
| 371 Iron and Steel Basic Industries | 0.0 | 1.2 | 0.0 | 0.7 | 0.2 | -0.4 | -0.3 | 2.1 | -0.3 |
| 372 Non-Ferrous Metal Basic Industries | 0.0 | -0.2 | 0.0 | -2.2 | 0.3 | 0.2 | 0.2 | 0.6 | 0.1 |
| 381 Fabricated Metal Products | 0.1 | 3.7 | -14.1 | -1.5 | 0.5 | 0.7 | 0.8 | -3.6 | 0.6 |
| 382 Machinery (ex electrical) | 1.3 | -2.9 | 6.0 | 4.4 | 1.0 | 1.1 | 1.5 | -11.3 | 1.3 |
| 383 Electrical Machinery | 0.2 | -6.1 | 6.6 | 0.7 | -1.0 | 0.0 | 0.3 | 0.3 | 0.1 |
| 384 Transport Equipment | -2.1 | -4.5 | 4.8 | 2.0 | -1.7 | -1.4 | -1.4 | 0.8 | -1.5 |
| 385 Prof, Scientific & Optical Goods | 0.4 | 1.8 | 0.0 | 2.6 | 0.2 | 0.3 | 0.4 | 4.8 | 0.4 |
| 390 Other Manufacturing Industries | 0.7 | -0.6 | 5.5 | 0.8 | -0.3 | 0.7 | 0.7 | 5.3 | 0.7 |
| ALL MANUFACTURING | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ALL ECONOMY | 2.5 | 0.2 | 0.1 | 0.9 | 1.9 | 8.4 | -13.5 | -0.6 | 0.0 |

Table 2.21



2.7 Manufacturing employment by income decile

As noted previously, hours worked in manufacturing have declined, while that in the total economy have increased over the 1991 to 2001 period. Manufacturing accounted for 14.1% of total hours worked in 2001; down from 17.3% ten years earlier.

Average Weekly Hours Worked by Family Income Decile

| | 1991 | 1996 | 2001 | |
|--|---------------|---------------|---------------|----------------------------|
| Total Economy | | | | |
| Decile 1 | 4,290 | 4,331 | 4,281 | |
| Decile 2 | 4,405 | 4,901 | 4,984 | |
| Decile 3 | 4,487 | 5,035 | 5,205 | |
| Decile 4 | 4,512 | 5,180 | 5,326 | |
| Decile 5 | 4,556 | 5,249 | 5,505 | |
| Decile 6 | 4,629 | 5,383 | 5,410 | |
| Decile 7 | 4,655 | 5,241 | 5,664 | |
| Decile 8 | 4,694 | 5,552 | 5,506 | |
| Decile 9 | 4,827 | 5,443 | 5,987 | |
| Decile 10 | 4,825 | 5,595 | 5,748 | |
| All | 45,882 | 51,908 | 53,618 | |
| Manufacturing | | | | |
| Decile 1 | 638 | 566 | 518 | |
| Decile 2 | 878 | 777 | 739 | |
| Decile 3 | 914 | 903 | 858 | |
| Decile 4 | 897 | 932 | 892 | |
| Decile 5 | 868 | 926 | 880 | |
| Decile 6 | 841 | 917 | 882 | |
| Decile 7 | 819 | 927 | 812 | |
| Decile 8 | 772 | 833 | 781 | |
| Decile 9 | 661 | 739 | 622 | |
| Decile 10 | 667 | 587 | 570 | |
| Total Manufacturing | 7,955 | 8,107 | 7,554 | |
| | | | | % pt chge 91-01 |
| % of Manufacturing in Total Economy | | | | |
| Decile 1 | 14.9 | 13.1 | 12.1 | -2.8 |
| Decile 2 | 19.9 | 15.8 | 14.8 | -5.1 |
| Decile 3 | 20.4 | 17.9 | 16.5 | -3.9 |
| Decile 4 | 19.9 | 18.0 | 16.7 | -3.1 |
| Decile 5 | 19.0 | 17.6 | 16.0 | -3.1 |
| Decile 6 | 18.2 | 17.0 | 16.3 | -1.9 |
| Decile 7 | 17.6 | 17.7 | 14.3 | -3.3 |
| Decile 8 | 16.4 | 15.0 | 14.2 | -2.3 |
| Decile 9 | 13.7 | 13.6 | 10.4 | -3.3 |
| Decile 10 | 13.8 | 10.5 | 9.9 | -3.9 |
| TOT MFG | 17.3 | 15.6 | 14.1 | -3.3 |

Table 2.22

This 3.3% percentage point reduction in the relative size of manufacturing (as measured by average hours worked) is apparent across all 10 income decile groups. In particular however, the 5.1 percentage point reduction in the decile 2 group is most



noticeable. The next largest reductions are in the decile 3 and in the decile 10 groups. In contrast, the decile 6 income group experienced least decline at only 1.9 percentage points - well below the overall manufacturing average decline.

The reduction between 1991 and 2001 in the importance of manufacturing in the 2nd and 3rd deciles is clearly evident in the following figures.

Hours Worked in Mfg. as a % of All Hours Worked by Income Decile - 1991

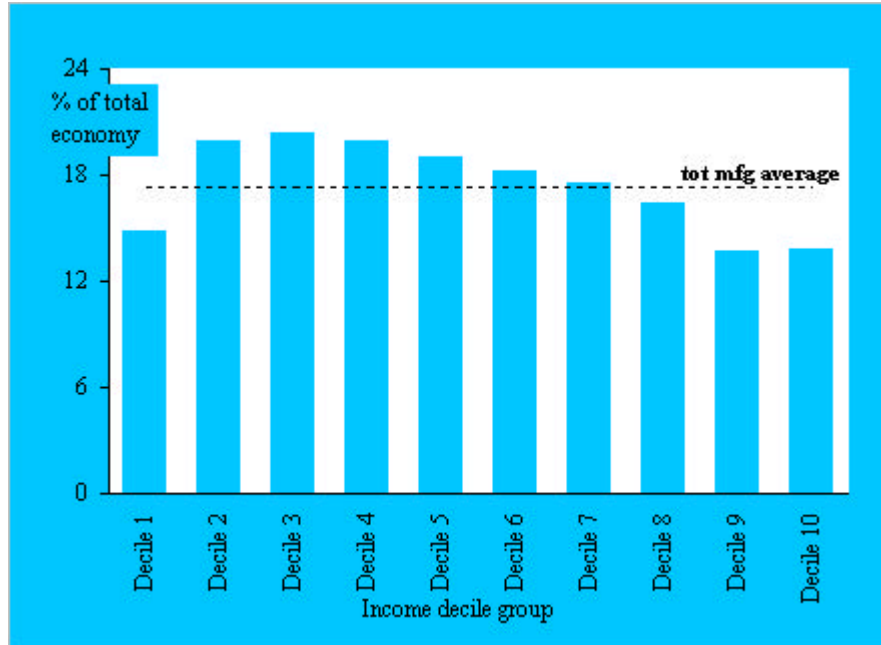


Figure 2.21

Hours Worked in Mfg. as a % of All Hours Worked by Income Decile - 2001

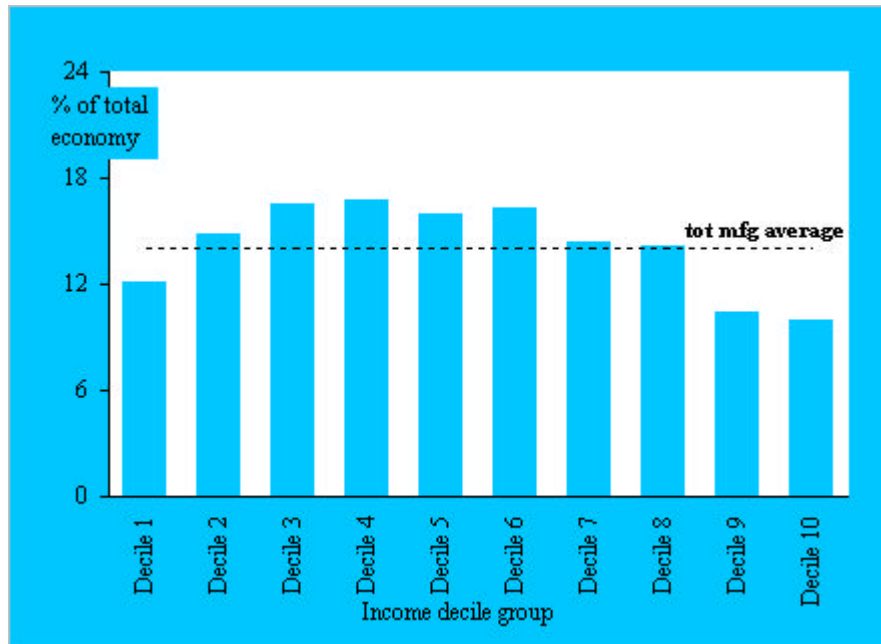


Figure 2.22



The 2001 composition (by income decile) of the hours worked within each manufacturing industry is provided in *Table 2.23* with the change in this composition since 1991 listed in *Table 2.24*

In terms of the share of each decile in overall manufacturing hours worked, *Table 2.24* shows the largest declines between 1991 and 2001 being recorded in the 1st and 2nd deciles - with the largest rise in the 6th family income decile.

Amongst the individual industries however, there was a wide disparity in movements, with little indication of any clear pattern or relationship in the change in importance of each decile and the change in tariff. As shown in the charts in *Figure 2.23* there is little to relate the movements across the industries to tariff changes experienced by those industries over the 1991 to 2001 period. Indeed, amongst the four deciles experiencing the largest changes (ie those illustrated below), the only income category to record a more than negligible relationship with tariff changes was the 10th decile (high income) grouping - with the implicit suggestion that the relative weight of hours worked by this income decile varies inversely with variation in tariffs. Although at first sight this seems odd, it may simply be the mirror image of the relative declines experienced by the other deciles.



Composition of Manufacturing Hours Worked ('000) by Family Income Decile

| NZSIC industry | % hours worked in 2001 accounted for by each family income decile | | | | | | | | | | Total |
|--|---|------|------|------|------|------|------|------|------|------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 311 Food Manufacturing | 7.8 | 11.7 | 13.5 | 13.7 | 12.1 | 12.5 | 9.5 | 9.0 | 5.3 | 4.8 | 100 |
| 312 Food Manufacturing | 9.5 | 11.5 | 11.9 | 12.3 | 11.4 | 10.7 | 9.2 | 9.5 | 7.4 | 6.7 | 100 |
| 313 Beverages | 7.2 | 9.1 | 9.5 | 9.4 | 10.3 | 9.1 | 10.7 | 12.1 | 11.1 | 11.5 | 100 |
| 314 Tobacco | 3.3 | 7.0 | 9.6 | 6.5 | 13.0 | 8.3 | 20.6 | 10.8 | 8.3 | 12.5 | 100 |
| 321 Textiles | 8.4 | 11.0 | 13.1 | 12.5 | 11.9 | 11.8 | 9.8 | 9.1 | 6.4 | 6.0 | 100 |
| 322 Clothing (ex footwear) | 12.5 | 12.3 | 12.3 | 12.4 | 10.9 | 11.7 | 8.1 | 6.9 | 6.6 | 6.4 | 100 |
| 323 Leather, Products, Substitutes & Fur | 8.4 | 12.9 | 15.1 | 14.4 | 11.1 | 13.2 | 8.7 | 7.9 | 4.3 | 4.0 | 100 |
| 324 Footwear | 10.0 | 12.2 | 10.2 | 12.6 | 12.7 | 8.8 | 9.5 | 8.0 | 8.3 | 7.7 | 100 |
| 331 Wood and Wood Products | 7.6 | 12.1 | 13.7 | 13.1 | 11.7 | 11.5 | 9.7 | 8.9 | 6.4 | 5.4 | 100 |
| 332 Furniture and Fixtures | 7.8 | 12.8 | 12.6 | 12.4 | 10.6 | 11.4 | 9.1 | 8.9 | 7.0 | 7.4 | 100 |
| 341 Paper and Paper Products | 3.6 | 5.5 | 6.7 | 8.7 | 12.0 | 11.6 | 13.8 | 14.5 | 12.7 | 10.9 | 100 |
| 342 Printing, Publishing and Allied Industries | 4.9 | 6.6 | 8.7 | 10.1 | 11.4 | 10.7 | 12.2 | 12.1 | 12.2 | 11.0 | 100 |
| 351 Industrial Chemicals | 4.8 | 7.6 | 8.5 | 10.6 | 11.5 | 10.7 | 14.6 | 11.3 | 10.3 | 10.1 | 100 |
| 352 Other Chemical Products | 5.7 | 6.6 | 8.6 | 9.1 | 10.5 | 11.1 | 12.3 | 12.5 | 11.9 | 11.8 | 100 |
| 353 Petroleum Refineries | 0.0 | 5.1 | 4.7 | 5.6 | 5.1 | 14.0 | 20.3 | 16.6 | 15.2 | 13.4 | 100 |
| 354 Products of Petroleum and Coal | 7.7 | 9.3 | 15.0 | 10.0 | 12.0 | 15.6 | 9.5 | 11.8 | 5.4 | 3.6 | 100 |
| 355 Rubber Products | 5.1 | 6.8 | 11.0 | 10.6 | 13.7 | 12.6 | 12.2 | 14.3 | 7.7 | 6.0 | 100 |
| 356 Plastic Products nec | 7.1 | 9.3 | 10.8 | 11.2 | 11.1 | 11.4 | 10.9 | 10.6 | 9.5 | 8.2 | 100 |
| 361 Pottery, China and Earthenware | 14.2 | 14.5 | 13.1 | 12.3 | 10.6 | 10.6 | 6.7 | 6.8 | 6.5 | 4.7 | 100 |
| 362 Glass and Glass Products | 7.8 | 8.4 | 12.4 | 7.6 | 11.2 | 8.9 | 13.0 | 10.2 | 11.0 | 9.4 | 100 |
| 369 Other Non-Metallic Mineral Products | 5.4 | 9.8 | 12.5 | 11.4 | 12.1 | 12.0 | 11.3 | 11.8 | 7.3 | 6.4 | 100 |
| 371 Iron and Steel Basic Industries | 5.1 | 6.3 | 7.9 | 8.6 | 11.1 | 11.2 | 14.3 | 12.7 | 12.5 | 10.3 | 100 |
| 372 Non-Ferrous Metal Basic Industries | 4.7 | 6.5 | 7.2 | 10.1 | 13.6 | 13.2 | 13.8 | 13.8 | 8.4 | 8.7 | 100 |
| 381 Fabricated Metal Products | 5.9 | 9.4 | 11.4 | 12.1 | 12.0 | 12.1 | 10.5 | 10.8 | 8.1 | 7.5 | 100 |
| 382 Machinery (ex electrical) | 4.7 | 8.6 | 10.6 | 12.0 | 12.2 | 12.3 | 11.3 | 11.1 | 8.8 | 8.4 | 100 |
| 383 Electrical Machinery | 6.4 | 8.0 | 10.4 | 10.7 | 11.8 | 11.7 | 12.4 | 10.8 | 9.2 | 8.7 | 100 |
| 384 Transport Equipment | 5.0 | 8.4 | 10.2 | 11.4 | 12.1 | 12.4 | 11.9 | 11.6 | 9.1 | 7.8 | 100 |
| 385 Prof, Scientific & Optical Goods | 7.3 | 7.5 | 8.2 | 10.6 | 10.9 | 10.5 | 12.9 | 10.6 | 11.6 | 10.0 | 100 |
| 390 Other Manufacturing Industries | 10.4 | 11.9 | 11.9 | 11.0 | 9.7 | 10.1 | 9.4 | 8.2 | 9.2 | 8.3 | 100 |
| ALL MANUFACTURING | 6.9 | 9.8 | 11.4 | 11.8 | 11.7 | 11.7 | 10.7 | 10.3 | 8.2 | 7.5 | 100 |
| ALL ECONOMY | 8.0 | 9.3 | 9.7 | 9.9 | 10.3 | 10.1 | 10.6 | 10.3 | 11.2 | 10.7 | 100 |

Table 2.23



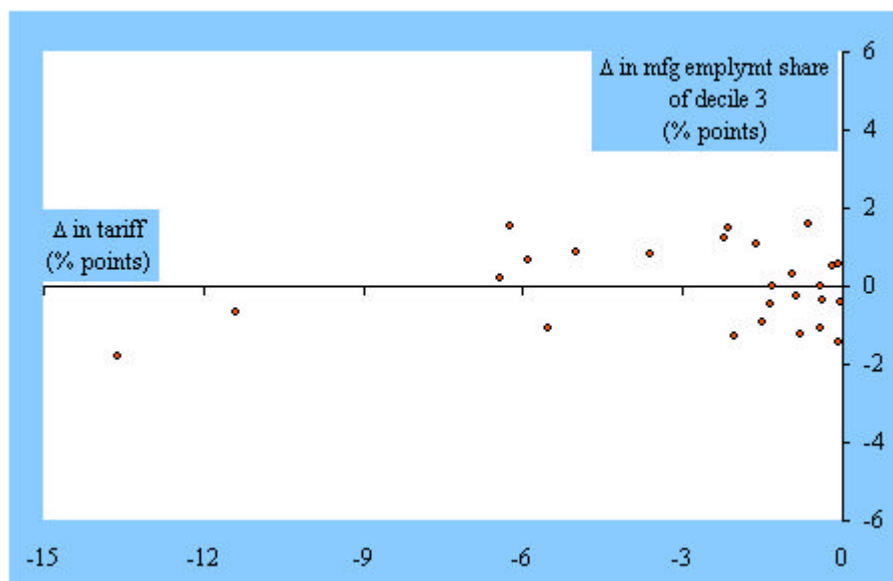
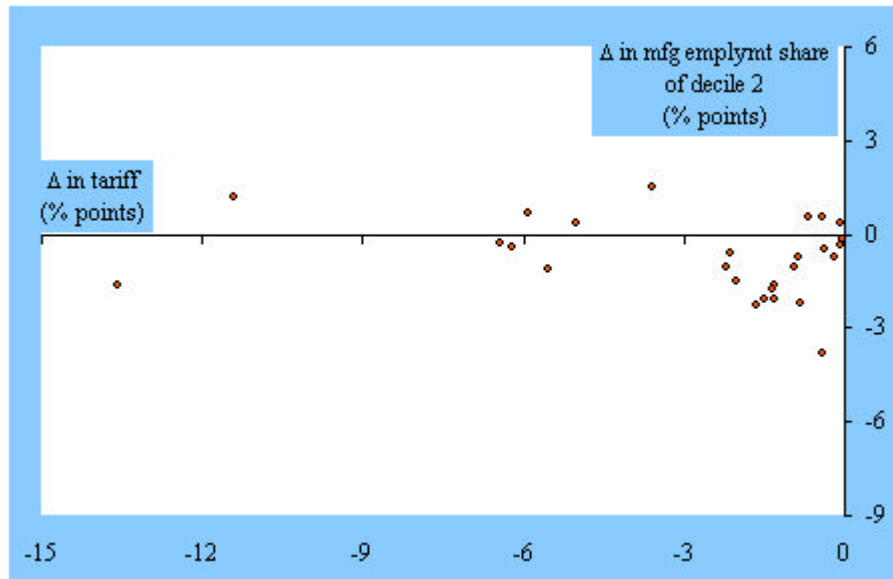
Change in Composition of Manufacturing Hours Worked ('000) by Family Income Decile: 1991-2001

| NZSIC industry | % hours worked in 2001 accounted for by each family income decile | | | | | | | | | | Total |
|--|---|------|------|------|------|------|------|------|------|------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 311 Food Manufacturing | -1.5 | -1.1 | 0.3 | 1.0 | 0.5 | 2.2 | -0.1 | 0.6 | -0.6 | -1.3 | 0.0 |
| 312 Food Manufacturing | -0.2 | 0.5 | 1.6 | 1.3 | 0.9 | 0.4 | -0.7 | -0.3 | -1.4 | -2.1 | 0.0 |
| 313 Beverages | 1.1 | 1.2 | -0.7 | -2.1 | 0.0 | -1.6 | -1.1 | 1.2 | 0.1 | 1.9 | 0.0 |
| 314 Tobacco | -5.1 | -0.9 | -3.2 | -4.6 | 0.0 | -0.5 | 8.0 | 2.6 | -1.7 | 5.4 | 0.0 |
| 321 Textiles | -1.3 | -1.8 | 0.1 | 0.2 | 1.4 | 2.5 | 0.3 | 0.5 | -0.4 | -1.4 | 0.0 |
| 322 Clothing (ex footwear) | 0.6 | -2.0 | -0.9 | 0.4 | 1.0 | 2.6 | -0.7 | -1.5 | 0.3 | 0.3 | 0.0 |
| 323 Leather, Products, Substitutes & Fur | -1.3 | -0.4 | 1.5 | 1.1 | 0.6 | 4.0 | -0.2 | -0.7 | -1.6 | -3.0 | 0.0 |
| 324 Footwear | -0.2 | -1.6 | -1.8 | 0.2 | 0.2 | 1.0 | 0.9 | -1.1 | 0.7 | 1.7 | 0.0 |
| 331 Wood and Wood Products | -1.8 | -2.3 | 1.1 | 1.5 | 0.9 | 1.3 | 0.4 | 0.1 | -0.1 | -1.2 | 0.0 |
| 332 Furniture and Fixtures | -1.7 | -0.3 | 0.2 | 1.6 | 0.5 | 1.0 | 0.0 | -0.6 | -0.7 | -0.1 | 0.0 |
| 341 Paper and Paper Products | -0.8 | -1.5 | -1.3 | -0.7 | 1.4 | -0.2 | 1.6 | 2.7 | 0.2 | -1.4 | 0.0 |
| 342 Printing, Publishing and Allied Industries | 0.0 | -0.5 | -0.3 | 1.1 | 0.6 | -1.2 | 0.5 | 0.6 | 0.4 | -1.2 | 0.0 |
| 351 Industrial Chemicals | 1.1 | -0.2 | -0.4 | -0.4 | 0.3 | -1.6 | 2.6 | 0.1 | -1.1 | -0.5 | 0.0 |
| 352 Other Chemical Products | -0.1 | -0.7 | -0.3 | -1.0 | 0.4 | 0.3 | 1.0 | 0.7 | 0.5 | -0.8 | 0.0 |
| 353 Petroleum Refineries | -3.3 | 1.5 | 0.8 | 0.9 | -4.2 | 0.0 | 6.1 | 1.9 | -1.1 | -2.8 | 0.0 |
| 354 Products of Petroleum and Coal | 2.9 | 0.4 | 0.6 | -3.8 | 5.7 | 1.8 | 2.6 | -5.8 | 0.1 | -4.5 | 0.0 |
| 355 Rubber Products | -0.9 | -0.6 | 1.5 | 0.9 | 1.7 | -1.3 | -0.5 | 3.8 | -1.4 | -3.3 | 0.0 |
| 356 Plastic Products nec | -2.0 | -1.0 | 1.2 | 0.2 | -0.5 | 0.9 | 1.2 | 0.4 | 0.5 | -0.8 | 0.0 |
| 361 Pottery, China and Earthenware | -6.1 | 0.4 | 0.8 | 1.6 | -1.3 | 4.6 | -2.0 | -0.3 | 1.4 | 0.9 | 0.0 |
| 362 Glass and Glass Products | -1.7 | -3.8 | 0.0 | -4.6 | 0.3 | -0.9 | 3.6 | 2.3 | 2.9 | 2.0 | 0.0 |
| 369 Other Non-Metallic Mineral Products | -1.3 | -2.1 | 0.0 | -1.5 | 0.4 | 1.9 | 1.2 | 2.5 | -0.5 | -0.6 | 0.0 |
| 371 Iron and Steel Basic Industries | 0.6 | -0.7 | 0.5 | -0.5 | 2.1 | -0.9 | 1.5 | 1.1 | -1.0 | -2.6 | 0.0 |
| 372 Non-Ferrous Metal Basic Industries | 0.3 | -0.3 | -1.4 | -0.8 | 1.2 | 0.0 | 0.9 | 2.3 | -1.0 | -1.2 | 0.0 |
| 381 Fabricated Metal Products | -2.4 | -1.6 | 0.0 | 1.2 | 1.4 | 1.8 | 0.3 | 1.1 | -0.3 | -1.4 | 0.0 |
| 382 Machinery (ex electrical) | -1.8 | -2.2 | -1.2 | 1.1 | 0.8 | 1.9 | 0.6 | 0.8 | 0.3 | -0.3 | 0.0 |
| 383 Electrical Machinery | -1.2 | -1.7 | -0.4 | -0.8 | 1.2 | 1.2 | 1.5 | 0.6 | 0.0 | -0.3 | 0.0 |
| 384 Transport Equipment | -1.3 | -1.1 | -1.1 | 0.6 | 0.8 | 1.1 | 1.1 | 1.3 | 0.2 | -1.6 | 0.0 |
| 385 Prof, Scientific & Optical Goods | 1.5 | 0.5 | -1.1 | 1.9 | -0.6 | -1.1 | -0.6 | 2.1 | -0.1 | -2.7 | 0.0 |
| 390 Other Manufacturing Industries | 0.5 | 0.7 | 0.6 | 1.1 | 0.7 | -0.4 | 0.0 | -1.8 | -0.8 | -0.7 | 0.0 |
| ALL MANUFACTURING | -1.2 | -1.3 | -0.1 | 0.5 | 0.7 | 1.1 | 0.5 | 0.6 | -0.1 | -0.8 | 0.0 |
| ALL ECONOMY | -1.4 | -0.3 | -0.1 | 0.1 | 0.3 | 0.0 | 0.4 | 0.0 | 0.6 | 0.2 | 0.0 |

Table 2.24



Changes in manufacturing decile shares in hours worked and tariffs : 1991-2001



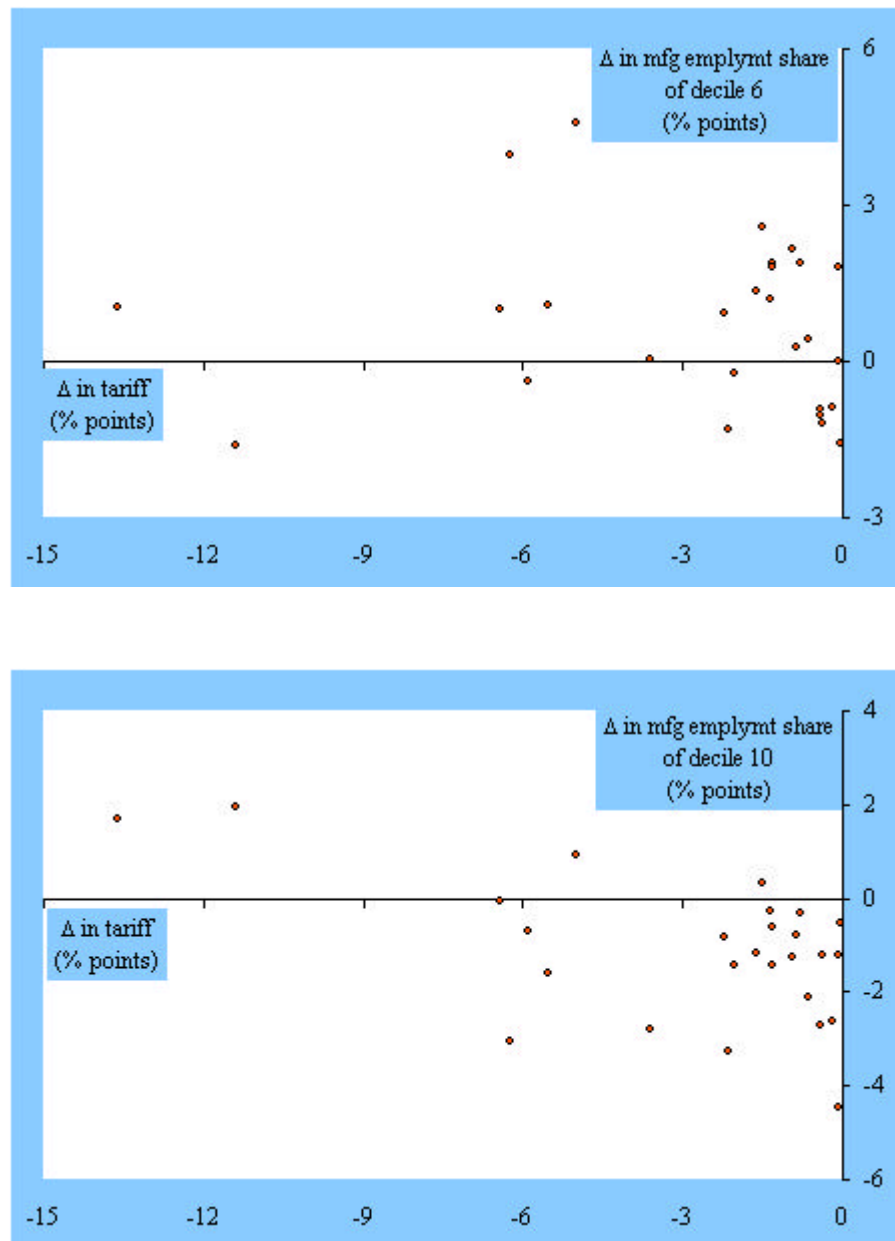


Figure 2.23

Note that as before alcohol and tobacco have been excluded.

Calculating shares across the other dimension - ie the importance of each industry within manufacturing by each income decile - is similarly unenlightening. Listed in *Table 2.24* below are the percentage-point changes in these shares between 1991 and 2001. Looking at the decile-specific changes here, provides little evidence that one particular decile has shifted predominantly more than any other. The biggest industry mover - 311 food manufacturing - illustrates that the changes are spread fairly evenly across the deciles, with the 1st decile falling the greatest and the 6th decile the least, consistent with the overall manufacturing numbers noted earlier. Another industry worthy of note - 322 clothing ex footwear - also indicates sporadic, as opposed to the systematic changes being recorded across all deciles.



Change in Industry Share of Manufacturing Hours Worked ('000) by Family Income Decile: 1991-2001

| NZSIC industry | % hours worked in 2001 accounted for by each family income decile | | | | | | | | | | Total |
|--|---|------|------|------|------|------|------|------|------|------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 311 Food Manufacturing | -7.1 | -6.1 | -6.0 | -6.0 | -6.6 | -4.2 | -6.3 | -5.0 | -5.3 | -5.7 | -5.8 |
| 312 Food Manufacturing | 4.6 | 4.0 | 3.5 | 3.4 | 3.1 | 2.8 | 2.5 | 2.7 | 2.5 | 2.5 | 3.1 |
| 313 Beverages | 0.8 | 0.7 | 0.3 | 0.0 | 0.3 | 0.0 | 0.2 | 0.6 | 0.6 | 1.2 | 0.4 |
| 314 Tobacco | -0.2 | -0.1 | -0.2 | -0.2 | -0.2 | -0.1 | -0.1 | -0.1 | -0.2 | 0.0 | -0.1 |
| 321 Textiles | -0.5 | -0.6 | -0.4 | -0.6 | -0.2 | 0.1 | -0.4 | -0.4 | -0.5 | -0.7 | -0.4 |
| 322 Clothing (ex footwear) | -2.4 | -3.3 | -3.0 | -2.6 | -2.1 | -1.6 | -2.4 | -2.8 | -1.7 | -1.3 | -2.4 |
| 323 Leather, Products, Substitutes & Fur | 0.2 | 0.4 | 0.4 | 0.3 | 0.2 | 0.5 | 0.1 | 0.0 | -0.1 | -0.2 | 0.2 |
| 324 Footwear | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.4 | -0.4 | -0.5 | -0.4 | -0.3 | -0.5 |
| 331 Wood and Wood Products | 1.3 | 1.5 | 2.6 | 2.3 | 1.7 | 1.7 | 1.4 | 1.1 | 1.2 | 0.7 | 1.6 |
| 332 Furniture and Fixtures | 1.1 | 1.8 | 1.3 | 1.5 | 0.9 | 1.0 | 0.8 | 0.6 | 0.7 | 1.4 | 1.1 |
| 341 Paper and Paper Products | -0.8 | -1.1 | -1.2 | -1.4 | -1.1 | -1.8 | -1.3 | -1.1 | -1.9 | -2.0 | -1.3 |
| 342 Printing, Publishing and Allied Industries | 1.7 | 1.1 | 0.8 | 1.5 | 1.1 | -0.5 | 1.3 | 1.3 | 2.2 | 1.8 | 1.2 |
| 351 Industrial Chemicals | 0.4 | 0.1 | -0.1 | -0.2 | -0.1 | -0.5 | 0.3 | -0.2 | -0.3 | 0.1 | -0.1 |
| 352 Other Chemical Products | 0.3 | 0.1 | 0.1 | -0.2 | 0.1 | 0.0 | 0.3 | 0.2 | 0.3 | 0.3 | 0.1 |
| 353 Petroleum Refineries | -0.2 | -0.1 | -0.1 | -0.1 | -0.4 | -0.5 | -0.5 | -0.6 | -0.7 | -0.7 | -0.4 |
| 354 Products of Petroleum and Coal | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | -0.1 | 0.0 | -0.1 | 0.0 |
| 355 Rubber Products | -0.2 | -0.1 | -0.1 | -0.2 | -0.2 | -0.5 | -0.4 | -0.1 | -0.4 | -0.5 | -0.2 |
| 356 Plastic Products nec | 0.4 | 0.6 | 0.9 | 0.5 | 0.2 | 0.5 | 0.8 | 0.5 | 0.9 | 0.7 | 0.6 |
| 361 Pottery, China and Earthenware | -0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.2 | -0.1 | 0.0 | 0.1 | 0.1 | 0.0 |
| 362 Glass and Glass Products | -0.2 | -0.3 | -0.2 | -0.4 | -0.2 | -0.2 | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 |
| 369 Other Non-Metallic Mineral Products | 0.0 | 0.0 | 0.2 | -0.2 | 0.1 | 0.3 | 0.3 | 0.5 | 0.0 | 0.1 | 0.1 |
| 371 Iron and Steel Basic Industries | 0.0 | -0.2 | -0.2 | -0.4 | -0.1 | -0.6 | -0.3 | -0.4 | -0.7 | -0.8 | -0.4 |
| 372 Non-Ferrous Metal Basic Industries | 0.1 | 0.0 | -0.2 | -0.3 | -0.1 | -0.3 | -0.1 | 0.1 | -0.3 | -0.2 | -0.1 |
| 381 Fabricated Metal Products | -0.6 | 0.6 | 1.0 | 1.5 | 1.5 | 1.5 | 0.9 | 1.3 | 0.7 | 0.4 | 1.0 |
| 382 Machinery (ex electrical) | -0.3 | 0.0 | 0.1 | 1.2 | 0.8 | 1.3 | 0.9 | 1.0 | 1.2 | 1.4 | 0.8 |
| 383 Electrical Machinery | 0.8 | 0.4 | 0.7 | 0.3 | 1.1 | 0.9 | 1.4 | 0.9 | 1.0 | 1.3 | 0.9 |
| 384 Transport Equipment | -0.2 | 0.1 | -0.3 | 0.2 | 0.1 | 0.1 | 0.4 | 0.4 | 0.3 | -0.3 | 0.1 |
| 385 Prof, Scientific & Optical Goods | 0.7 | 0.5 | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.8 | 0.7 | 0.6 |
| 390 Other Manufacturing Industries | 0.8 | 0.6 | 0.3 | 0.2 | 0.1 | -0.2 | 0.0 | -0.4 | 0.0 | 0.2 | 0.1 |
| ALL MANUFACTURING | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Figure 2.24



3 SURVEY ANALYSIS

3.1 Introduction

The previous section looked for evidence of the importance of past tariff changes on patterns of employment – by industry, region, ethnicity and gender. The overall conclusion was that with a few exceptions, tariff reform had a relatively minor effect on employment changes. In this section we take the perspective forward and look at how firms currently assess tariffs and further tariff reform in relation to other factors which may affect future business performance.

A postal survey was sent out to 400 companies selected from the Universal Business Directories' database. Selection was random, but stratified by industry so as to obtain companies for whom tariffs are potentially important. In total 271 useable responses were received by the close-off date. Ten companies could not be traced and 22 were later discovered to be ineligible. Thus the effective response rate was 73.6%.

The full purpose of the survey was to seek companies' views on the importance of tariffs in relation to a collection of other factors which might affect performance. These factors included both macroeconomic variables such as corporate tax rates, and company specific variables such as the importance of a brand. Some questions were also asked about how various aspects of the business might look in 2007 under two scenarios – no change in tariffs and complete abolition of tariffs.

3.2 Results: Questions 1-16

Questions 1-16 of the survey sought respondents' views on a number of issues which might affect their business. The results are summarised in *Table 3.2*. The full questionnaire is shown after the section 3.3.

With questions such as these it is difficult to obtain a robust quantitative measure of the relative importance of the various issues. An attempt at this is given in the lower half of *Table 3.2* which shows the rank of each issue in terms of the percentage of respondent who either 'strongly agreed' or 'agreed.' Note that Question 16 has not been included in this ranking as it relates more to behaviour than opinion. Also, because Question 12 is written in the negative we have reversed the responses.

Tariff related issues are not amongst the leading concerns of business. Tariffs on competing imports rank 8th out of 15, the effect of uncertainty about future tariffs on capital spending ranks 14th, whilst tariffs on inputs are last on the list. The top four issues comprise two firm specific ones – a wide product range and brand recognition, and two macroeconomic ones – access to skilled labour and the company tax rate.

Another way of assigning importance is to score the five response categories. The obvious choices for a weighting scheme are a linear scale {2,1,0,-1,-2}, or a nonlinear scale which gives more weight to the extreme responses such as {10,3,0,-3,-10}. A nonlinear scale which gives less weight to the extreme responses is also a possibility, but seems improbable. The lower half of *Table 3.2* shows the scores and associated ranks under the two hypothesised weighting schemes.

Clearly the difference between the linear and nonlinear weighting system is negligible. Also the results align closely with the 'agreement' ranking. Tariff protection on competing imports ranks 7th, tariff uncertainty is 12th or 13th and tariffs on inputs remains at 15th. Access to skilled labour, tax rates, and brand recognition are still in the top four issues along with interest rates – instead of product range. Some caution is required here, however, as the question about interest rates is in the



context of ability to invest. Agreement that interest rates affect investment does not necessarily mean that interest rates are important in a wider context.

Rank of issues v score of issues

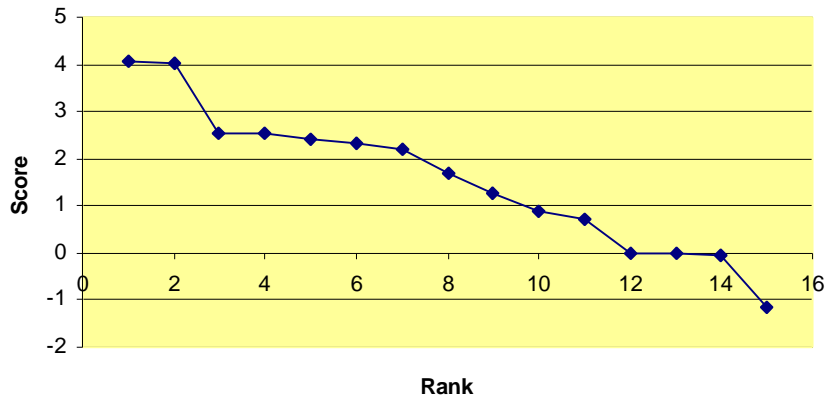


Figure 3.1

Figure 3.1 shows that the relationship between the rank and the score (using the nonlinear weighting scheme) is approximately linear. This means for example that the ranking of 'tariffs on competing imports' as 8th out of 15, really does mean that respondents give it medium importance. Had the relationship been concave for example, it would have indicated relatively small differences in importance between the higher ranked issues, but large differences between the lower ranked issues.

The final column in Table 3.2 and also Figure 3.2 show how the response to the question on tariff protection (Q9) is correlated with the response to the other questions. Not surprisingly, Question 10 on uncertainty about future tariffs exhibits the highest correlation. Next most correlated are the relative degree of competition from imports followed by interest rates. These results tell a consistent story; that firms which compete with imports see tariff protection as an important enough issue for uncertainty about future levels of protection to have a significant effect on their investment plans. Investment plans are also sensitive to interest costs.

Correlation with Question 9

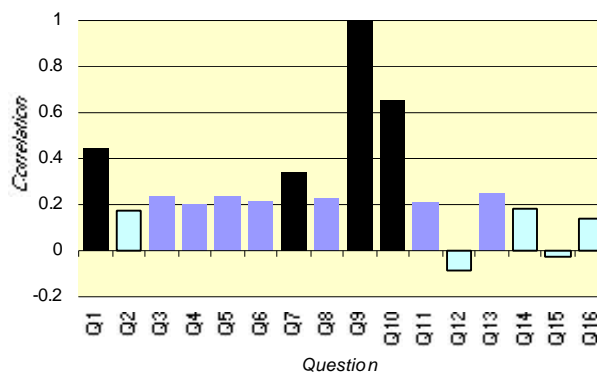


Figure 3.2

Interestingly, the issues which are least correlated with tariff protection add colour to the story. Firms for which tariff protection is important see labour costs as a problem.



⁵ Reflecting this emphasis on labour, such firms argue that having the latest plant and equipment would not significantly cut production costs. And these firms are not high-tech businesses. Nevertheless they see themselves as spending as much on research and development as their competitors – which of course tells us nothing about relative research and development expenditure in the whole industry.

One apparent contradiction in this picture is that these low-tech, tariff-dependent firms said that they do not compete mainly on price.⁶ This might mean that margins are too tight for firms to even contemplate lowering prices to increase demand, which would be consistent with a constant emphasis on reducing labour and capital costs.

3.3 Results: Questions 17-22

Questions 17-22 are primarily concerned with asking about future levels of activity with and without tariffs. The main results are summarised in *Table 3.1*.

Two Scenarios for 2007

| | Current Year | 2007 tariffs | 2007 no tariffs |
|------------------------------------|--------------|-----------------|--------------------|
| Means | | | |
| Annual turnover (\$m) | 40.5 | 51.9 | 54.6 |
| FTEs | 298.1 | 344.4 | 340.9 |
| Exports / Turnover | 34.0% | 37.3% | 37.6% |
| Raw material imports / Total costs | 24.0% | 24.2% | 24.1% |
| Imported finished goods / Sales | 15.3% | 16.5% | 21.9% |
| Medians | | | |
| Annual turnover (\$m) | 7.3 | 10.0 | 11.0 |
| FTEs | 61.0 | 61.0 | 52.0 |
| Exports / Turnover | 20.0% | 25.0% | 20.0% |
| Raw material imports / Total costs | 15.0% | 15.8% | 16.3% |
| Imported finished goods / Sales | 2.0% | 2.5% | 5.0% |

Table 3.1

The first point to note about these results is that the underlying distributions are evidently very skewed, with the means being considerably above the medians. Nevertheless the two sets of figures depict a reasonably consistent picture:

- Turnover is expected to rise over the period to 2007, with suggestions of a greater increase if tariffs are abolished.
- The higher output under free trade is associated with lower employment, perhaps indicating that lower protection is a spur to higher labour productivity.
- An increasing share of output is expected to be exported by 2007, although there are conflicting indications on whether this shift would be affected by tariff changes.

⁵ This is simply the converse of the result that firms who think labour costs are not a problem tend not to be those for whom tariffs are important.

⁶ That is, firms which do compete mainly on price tend not to be those for which tariffs are important.



-
- Raw material imports as a proportion of total costs are expected to rise slightly over the next five years, but again there is no clear relationship with tariffs.
 - In contrast there is a clear trend to importing and on-selling more finished goods, especially if tariffs are removed. This is consistent with lower employment per unit of sales – refer point 2 above.

Overall we infer that firms expect to increase turnover by about 30% over the next five years, with more of this coming from imported final products if tariffs are removed. This would displace local production and thus cause slower employment growth – in these firms.

3.4 Summary

The results of the survey provide wider confirmation of the inferences drawn from the case studies. Most notably, tariffs are not a major issue for many companies, although there are exceptions. This is particularly true for companies which either are or have become less labour intensive, more export oriented, and more innovative in terms of product development, sourcing of materials and production processes.

Results of Postal Survey (Questions 1 –16)

| No | Issue | | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|-----|---|---|----------------|-------|----------|----------|-------------------|
| Q1 | Our main competition in NZ is from foreign firms, not other NZ firms | % | 30.9 | 17.6 | 4.6 | 27.9 | 19.1 |
| Q2 | Our company competes mainly on price | % | 15.4 | 45.1 | 3.0 | 28.9 | 7.5 |
| Q3 | Having a wide range of products is central to our business strategy | % | 20.3 | 48.7 | 4.2 | 23.0 | 3.8 |
| Q4 | The success of our business depends on having well-recognised brands | % | 23.2 | 42.1 | 9.1 | 21.7 | 3.9 |
| Q5 | We could expand sales by at least 10% if the NZ dollar were 10% lower | % | 17.1 | 22.1 | 22.5 | 31.4 | 7.0 |
| Q6 | If company tax were cut to 28% we could expand our business by at least 10% | % | 33.5 | 35.0 | 22.6 | 7.8 | 1.2 |
| Q7 | The level of interest rates has a big effect on our ability to invest | % | 19.8 | 43.2 | 13.6 | 23.0 | 0.4 |
| Q8 | Tariffs on our imported inputs are a big problem for us | % | 7.2 | 18.4 | 20.8 | 42.0 | 11.6 |
| Q9 | Tariff protection against competing imports is important to us | % | 29.6 | 25.3 | 13.8 | 22.5 | 8.7 |
| Q10 | Uncertainty about post-2006 tariffs means we will reduce capital spending | % | 10.0 | 18.8 | 34.4 | 30.4 | 6.4 |
| Q11 | Tariff barriers in the markets we export to are important problems for us | % | 20.4 | 27.0 | 24.3 | 23.9 | 4.4 |
| Q12 | As far as we are concerned, our labour costs in NZ are not a problem | % | 5.4 | 43.2 | 11.3 | 31.5 | 8.6 |
| Q13 | It is very difficult to employ staff with the skills we need | % | 35.0 | 39.7 | 5.4 | 18.7 | 1.2 |
| Q14 | The latest plant and equipment would cut our production costs by at least 10% | % | 19.0 | 38.9 | 20.2 | 20.6 | 1.2 |
| Q15 | Ours is a very high-tech business | % | 9.7 | 32.2 | 10.1 | 41.1 | 7.0 |
| Q16 | Compared to our competitors, we spend very little on R&D | % | 5.9 | 26.7 | 22.7 | 30.6 | 14.1 |

| No | Issue | Rank | Linear Score | Rank | Nonlinear Score | Rank | Correlation with Q9 |
|-----|---|------|--------------|------|-----------------|------|---------------------|
| Q1 | Our main competition in NZ is from foreign firms, not other NZ firms | 9 | 0.13 | 10 | 0.87 | 10 | 0.440 |
| Q2 | Our company competes mainly on price | 6 | 0.32 | 9 | 1.27 | 9 | 0.175 |
| Q3 | Having a wide range of products is central to our business strategy | 2 | 0.59 | 5 | 2.42 | 5 | 0.236 |
| Q4 | The success of our business depends on having well-recognised brands | 4 | 0.59 | 4 | 2.54 | 4 | 0.204 |
| Q5 | We could expand sales by at least 10% if the NZ dollar were 10% lower | 13 | 0.11 | 11 | 0.73 | 11 | 0.231 |
| Q6 | If company tax were cut to 28% we could expand our business by at least 10% | 3 | 0.92 | 1 | 4.05 | 1 | 0.220 |
| Q7 | The level of interest rates has a big effect on our ability to invest | 5 | 0.59 | 3 | 2.55 | 3 | 0.336 |
| Q8 | Tariffs on our imported inputs are a big problem for us | 15 | -0.32 | 15 | -1.15 | 15 | 0.226 |
| Q9 | Tariff protection against competing imports is important to us | 8 | 0.45 | 7 | 2.18 | 7 | 1.000 |
| Q10 | Uncertainty about post-2006 tariffs means we will reduce capital spending | 14 | -0.04 | 13 | 0.01 | 12 | 0.653 |
| Q11 | Tariff barriers in the markets we export to are important problems for us | 10 | 0.35 | 8 | 1.69 | 8 | 0.209 |
| Q12 | As far as we are concerned, our labour costs in NZ are not a problem | 12 | -0.05 | 14 | -0.04 | 14 | -0.089 |
| Q13 | It is very difficult to employ staff with the skills we need | 1 | 0.89 | 2 | 4.02 | 2 | 0.248 |
| Q14 | The latest plant and equipment would cut our production costs by at least 10% | 7 | 0.54 | 6 | 2.33 | 6 | 0.184 |
| Q15 | Ours is a very high-tech business | 11 | -0.03 | 12 | 0.00 | 13 | -0.022 |
| Q16 | Compared to our competitors, we spend very little on R&D | | | | | | 0.137 |

Table 3.2



Decision Research Limited

Effects of tariffs in New Zealand: May 2002

Please tick ONE box next to each statement below to show us how much you agree or disagree. There are no right or wrong answers.

If the statement is not relevant to your situation, please ignore it, and go to the next statement.
All answers are completely confidential

| | | strongly agree | agree | not sure | dis-agree | strongly dis-agree |
|-----|---|----------------|-------|----------|-----------|--------------------|
| 1) | Our main competition in NZ is from foreign firms, not other NZ firms | | | | | |
| 2) | Our company competes mainly on price | | | | | |
| 3) | Having a wide range of products is central to our business strategy | | | | | |
| 4) | The success of our business depends on having well-recognised brands | | | | | |
| 5) | We could expand sales by at least 10% if the NZ dollar were 10% lower | | | | | |
| 6) | If company tax were cut to 28% we could expand our business by at least 10% | | | | | |
| 7) | The level of interest rates has a big effect on our ability to invest | | | | | |
| 8) | Tariffs on our imported inputs are a big problem for us | | | | | |
| 9) | Tariff protection against competing imports is important to us | | | | | |
| 10) | Uncertainty about post-2006 tariffs means we will reduce capital spending | | | | | |
| 11) | Tariff barriers in the markets we export to are important problems for us | | | | | |
| 12) | As far as we are concerned, our labour costs in NZ are not a problem | | | | | |
| 13) | It is very difficult to employ staff with the skills we need | | | | | |
| 14) | The latest plant and equipment would cut our production costs by at least 10% | | | | | |
| 15) | Ours is a very high-tech business | | | | | |
| 16) | Compared to our competitors, we spend very little on R&D | | | | | |

The following questions are to help us assess how the effect of tariffs varies with different types of companies.

We don't need exact values, but please give the best estimates you can.

The centre and right-hand columns are for your best guess as to what the position will be five years from now with and without tariff protection.

Remember all your answers are completely confidential to Decision Research

| | Current Year | 2007 Present Tariffs | 2007 No Tariffs |
|---|--------------|----------------------|-----------------|
| 17) Number of full-time employees | [_____] | [_____] | [_____] |
| 18) Number of part-time employees | [_____] | [_____] | [_____] |
| 19) Exports, as percentage of turnover, approximately | [_____%] | [_____%] | [_____%] |
| 20) Raw materials as a percentage of total costs | [_____%] | [_____%] | [_____%] |
| 21) Proportion of total sales that is imported as finished products | [_____%] | [_____%] | [_____%] |
| 22) Annual turnover of your company, approximately | \$_____ | [\$_____] | [\$_____] |
| 23) Is there any other comment you would like to make about tariffs? <i>(continue on other side if necessary)</i> | | | |

Thank you for completing the questionnaire

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4 CASE STUDIES

4.1 Executive summary

The objective of the case study work reported in this paper was to provide some detailed insights to how firms had responded to tariff changes over the past decade or so and also to seek responses to possible future tariff changes. The case studies help tease out the responses from the mail survey and also provide a practical understanding of the changes that lie behind the scenarios generated by the general equilibrium modelling work.

1. The reduction of tariffs over the past 15 years has been a factor in the decline and transformation of many previously highly protected manufacturing industries. Tariffs, however, have not been the only change in the economic environment facing businesses. And New Zealand firms have not been alone in having to deal with new economic rules that have threatened the survival of many companies.
2. One of the most dramatic changes has been the sharp decline in the rate of inflation from 9.8%pa over the 1980s to just 1.7% over the 1990s. The shift from a cost-plus business approach to a cost-down imperative was forced by a combination of lower tariffs, increased competition, high real interest rates, a floating exchange rate, tight spending control and business failures. Tariff reductions were an important part of the process but were by no means the sole factor in squeezing inflation out of the economy.
3. Changes in labour market conditions, and a no-cost-increase mentality allowed and compelled firms to change their business practices.
4. It is difficult to quantify the role of tariff reductions in driving the changes that have occurred within the manufacturing industry in New Zealand over the past 15 years. From an economy-wide perspective, the effect on overall GDP of reducing tariffs appears relatively small. General equilibrium modelling work undertaken as part of this review of tariffs shows that GDP would be less than 0.1% lower over a ten year period if current tariffs were reduced to zero immediately.
5. The New Zealand Institute of Economic Research has estimated that tariff reductions between 1987 and 1998 raised average household spending power by \$22 per week (1998 prices) compared to a no-change scenario.⁷
6. Of the 26 firms interviewed we would classify at least three firms as being subsistence businesses - they provide a cash surplus, they have some valuable assets on their balance sheets (mainly

⁷ Consumer benefits from import liberalisation: A New Zealand Case Study; New Zealand Institute of Economic Research, for Ministry of Foreign Affairs and Trade; June 1999.



buildings), but they are vulnerable to imports eating away at what is left of their customer base.

7. There are around four or five firms that are indifferent to what happens to tariffs. Their businesses are financially sound and they have product that would continue to compete effectively with lower priced imports. Quality, customisation, speed, design, and a significant level of natural protection are important ingredients to the commercial robustness of these businesses.
8. The small size of New Zealand and its distance from major competitors, as well as specific customer demands (the shape and size of New Zealanders) create some useful barriers to import competition. Firms have been forced to discover and play to these natural areas of protection.
9. The majority of firms occupy the middle ground on tariffs. They benefit from their existence but would survive or adapt to the introduction of lower tariffs.
10. The main focus of future tariff changes, according to the firms interviewed should be as follows:
 - Reciprocity
 - Certainty - spell out that intended path of tariff changes over the following five years and ideally beyond 2010
 - Time - businesses need time to adjust so the time over which changes will occur should reflect the significance of the intended changes
 - Harmonisation with Australia
 - Simplification/ consolidation
11. The tariff freeze is generally regarded as a helpful pause in the steady squeeze on margins that firms have had to manage as tariffs have been reduced over the past decade or more. A number of firms made the point that a period of stability has been very valuable in allowing/ encouraging them to think longer term. The increased certainty has led some firms to undertake investment and expansion they probably would not otherwise have embarked on. Two companies, were critical of the sudden nature of the change in tariff strategy. One had placed orders and written contracts on the basis that tariffs were to decline in line with the 1998 statements, and the freeze meant they were having to pay the higher tariff rates out of their profits. This simply emphasises the need to provide businesses with clear and long-term commitments to tariff rates.

4.2 Textile clothing and footwear

This case study covers the textile, clothing and footwear industry commonly referred to as the TCF industry/sector. Sixteen companies were interviewed as input to this case study. It also draws on the results of consultations with individual companies undertaken by the Ministry of Economic Development, and output from the TCF sector strategy work.



| | Clothing | Textiles (maximum) | Footwear |
|------------------------|----------|--------------------|----------|
| Current tariff: (1999) | 19.0% | 12.5% | 19.0% |
| 1995 | 32.5% | 21.0% | 35.0% |
| 1990 | 40.0% | 25.5% | 37.0% |
| 1987 | 65-40.0% | 40.0% | 43.0% |

NB: Tariff rates set out in this table and throughout the remainder of this report should be interpreted as typical rather than precise.

4.2.1 Industry characteristics

The industry covers a wide range of manufacturing/ business activities:

- the manufacture of inputs to the TCF sector - components, fabrics, etc,
- the manufacture of final consumer goods,
- the manufacture and retailing of final consumer goods,
- the management of the design, sourcing and distribution of final goods to retailers here and in Australia and further afield, without owning manufacturing capacity, or retail outlets.

A general observation is that the segmentation of the industry reflects the ongoing specialisation required to survive in a market where competition has intensified. That competition and free access to the Australian market has encouraged many businesses in this sector to develop export sales.

Several strategies have been adopted to achieve the competitiveness required to survive and to establish successful export operations. The most common has been the outsourcing of activities. Probably the most obvious has been the resort to contracting-out manufacturing operations to cheaper countries. In one case, getting the necessary volume from New Zealand manufacturers was also raised as a reason to produce off shore. Fiji was initially a popular source of cheap manufacturing capacity, but Asia now dominates.

The outsourcing of specific functions and components is also occurring between independent New Zealand firms. A number of the companies interviewed confirmed that they had outsourced some of their activities to local providers, including manufacture of specific components/garments and in one case design functions were being contracted out. At the core of the new strategies is the need to be cost competitive, but another important aspect appears to be that by being able to contract out activities firms have been able to continually strengthen their focus on what they are best at doing.

From the firms interviewed for this study as well as other work Infometrics⁸ has undertaken we suggest that this business distillation process is leading to a new business model. It is essentially a virtual business (solution provider) that pulls together a host of different activities along the value chain to deliver finished product to customers, either

⁸ Firm-level Manufacturing Export Study, Infometrics, for MED, TradeNZ, Treasury, April 2002.



using their own brand, or under some third party brand. By combining large run low cost manufacturing in Asia with small run fast turnaround local manufacturers this business model can provide a highly flexible, customised and low cost service to retail chains and brand owners. There were at least four companies in this study that we would regard as good examples of this new business model. Issues relating to the above points are discussed in more detail below.

Key statistics⁹:

| | | | |
|-----------------------------|------|------|------|
| | 1986 | 1996 | 2001 |
| Weekly hours worked ('000s) | 1705 | 954 | 731 |
| | 1989 | 1996 | 2001 |
| Exports \$m (HS 57-64) | 171 | 314 | 375 |
| Number of enterprises | | 2412 | 2154 |

4.2.1.1 Tariff freeze

The tariff freeze has been crucial to some firms, and useful for others. It has provided some firms with the breathing space to reorient their business. (One firm argued that it was imperative that the tariff freeze remain beyond 2005 so that it could complete the re-structuring of its business. This comes close to the infant-industry argument for tariff protection.)

4.2.2 Current strategy

The strategy most common throughout the TCF companies interviewed was the ongoing shift away from manufacturing to design, logistics and marketing. Management focus has shifted from manufacturing to sales. In some cases firms have abandoned, or contracted-out, manufacturing. Although we tend to think of TCF businesses as being part of the manufacturing industry, the actual manufacturing process is a diminishing part of the industry's overall value added.

The emphasis is on developing strong relationships with key customers and suppliers –

- provide solutions for retailers and brand owners
- create value package for retailers
- business to business sales
- target quality rather than quantity of customers

For three companies the primary strategy remains survival, highlighting the fact that there is still a significant number of businesses in the TCF sector that are marginally profitable and therefore remain vulnerable not just to tariff reductions but to a host of other business pressures.

⁹ Hours worked – from data used in Chapter 2. Exports – Harmonised System (HS) data, Statistics New Zealand. Enterprises – Business Unit Data, Statistics New Zealand



Few, if any, New Zealand TCF firms are able to compete on price with imported product from Asia. They have concentrated on service, in terms of small runs, fast turnaround, as well as quality, design and fit of the product. These strategies build on the areas of natural protection available to New Zealand firms – distance from competitors; small scale of demand; and cultural/market specific factors.

TCF firms are currently in the process of developing a sector strategy. An important element of the strategy they are likely to settle on will relate to exporting. The growth of the sector will depend heavily on developing export markets (we discuss exports in more detail below).

4.2.3 Response to tariff changes

Over the first five to seven years of tariff reduction firms in this study tended to make relatively incremental changes to their business although the changes were not always made purely as a response to falling tariff rates.

In many cases, the focus was on survival and so strategies tended to be relatively short-term with cost reduction being the most obvious and popular. In many cases this resulted in businesses shrinking (considerably in some cases), as product lines were abandoned, staff laid off and activities were out-sourced.

A number of factors conspired to provide businesses in the TCF sector with sufficient breathing space to develop more sophisticated strategies that offered more than simply survival. These factors included:

- A fall in the currency between 1990 and 1993
- Lower interest rates
- A more flexible labour market
- Strengthening domestic demand from 1992 through to 1996
- A more mature customer base - retailers and consumers - that could distinguish between price and value. Quick-response, locally manufactured goods could compete against cheaper but less customised imports.
- Increased specialisation within the industry that enabled firms to create competitive solution to retailers.

Firms have steadily built relationships and contracts with other players in the industry, both here and internationally in order to put together supply chains that can meet retailers' requirements.

By no means all firms have developed deeper strategies. Based on the interviews for this work there is still a number of firms in the TCF sector that remain basically subsistence businesses – providing sufficient income for the owner and employees. There is no capital surplus or vision to help plug the firm into any sort of growth strategy. That means there will be more business closures – tariff reduction from here would simply accelerate this process rather than trigger it.

There are some key areas of business that are relevant to how firms have responded to tariff reduction over the past 15 years. We discuss them under their own headings below.



4.2.4 Exporting

Although a significant number of the firms interviewed had been exporting for at least ten years, Australia remains virtually the sole export market. That reflects free access (margin preference) to that market and the relatively similar consumer taste/style.

The Australian market, however, is becoming more competitive as Asian firms increasingly target a small but rich market. Although tariffs are currently frozen, they have declined over the past decade, thus adding to the attraction of the market.

Furthermore, the Australian retailing industry is becoming more concentrated - fewer chains with strong buying power. They are looking for fewer suppliers, so New Zealand TCF firms either have to get bigger or pool their resources such as manufacturing capacity, skills (design, logistics) and product lines. At least one company interviewed was focused on co-ordinating the relevant functions from a range of individual companies to deliver an attractive solution to Australian retail chains. In this sense the company was acting as a catalyst for a potential cluster.

The percentage of sales exported ranged from virtually zero to 75%. Four firms exported 50% or more of their output, with the ratio of exports generally rising as the firm increased in size.

Textile Clothing Footwear exports

HS 58-64 \$ million, year ended March

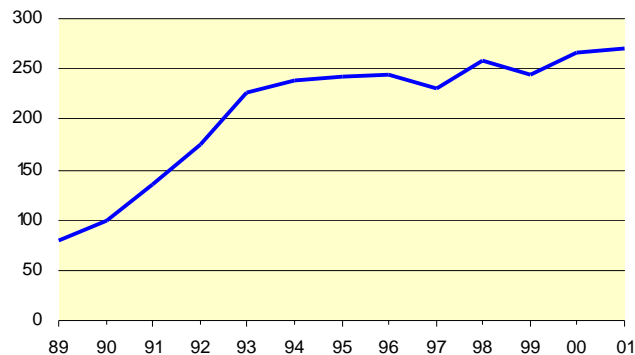


Figure 4.1

4.2.5 Importing / Contracting out

A logical response to the removal of protection would have been to change the whole nature of the business away from domestic manufacturing to importing and distributing product. A significant proportion of TCF businesses have undoubtedly done so. Almost all the companies that underpin this case study, though, still directly or indirectly retain some domestic manufacturing capacity.

There are few, if any, TCF companies that remain solely focused on domestic manufacturing (although some still manufacture a greater than 50% proportion of their goods here) – some portion of the range of final goods they sell is imported. In many instances the imported products are made under contract for the New Zealand company (in some cases in



New Zealand). In this way the firm maintains tight control of its product range and brand and protects its customer base to some degree.

Probably more common amongst TCF firms has been the contracting out of specific tasks or inputs. Footwear companies, for instance, have moved to import key components from Asia, or from specialist New Zealand businesses, rather than try and manufacture them in-house. This outsourcing has been an essential part of reducing costs and remaining competitive.

A reasonable proportion of all TCF imports come via local manufacturing businesses – in other words they control these imports in the context of their overall business. The bulk of imports, though, are determined by independent importers or retailers with no investment in local manufacturing.

Most firms interviewed faced competition from imported product. The most common strategy being used to confront this competition is to provide local customers with just-in-time delivery and product back-up so that retail customers are able to reduce stock levels and their working capital requirements. For weakly capitalised retailers this is an attractive option.

4.2.6 Industry infrastructure

A strongly held view within this and other industries affected by tariff reductions is that the infrastructure required to sustain growing companies has withered as the level of domestic production has shrunk.

In the TCF sector the lack of machinists is often identified as a constraint to growth. Or that there are too few specialist machine maintenance people.

Of the sixteen companies interviewed there was surprisingly little concern about the thinning infrastructure. The dwindling pool of skilled labour was commented on by a number of companies, but many saw it as being a result, rather than a cause, of the decline in manufacturing in New Zealand. As one or two companies pointed out, they were looking to reduce staff numbers rather than increase them.

Some argued that when the industry stabilised at some new, lower, level it would be easier to attract people into the industry, because they could offer potential employees a positive future. Others argued that while they could get machinists they could not get enough people with machine skills as well as an ability to supervise others. The most impressive companies appeared to be investing in training staff to meet their particular requirements.

In summary, the loss of infrastructure has been a logical outcome of the steady reduction in domestic manufacturing. But segmentation and specialisation have helped slow, and in some cases halt, the decline of local infrastructure. And, where appropriate, firms have turned to imports for key components. The ease with which product can be sourced from abroad means that it has become a cost-effective substitute for local suppliers/ infrastructure.



4.2.7 Product range

As competition intensifies we would normally expect firms to narrow their product range so that they can concentrate on their strengths. From the firms interviewed there is clear evidence that some companies have indeed narrowed the range of goods they manufacture. However, this response was not as emphatic or widespread as might have been anticipated.

Some companies deliberately expanded their product range in order to survive (maintain factory throughput). Others may have narrowed the range of products they produce, but as a business they have extended their product range using imports. This has been particularly important for garment producers. To maintain strong commercial relationships with retailers, firms have had to be able to deliver a full range of products.

Brand or business credibility is important in being able to expand the range of goods offered. The more successful a firm is the greater the opportunity there appears to be to add new products to their range. This becomes a virtuous cycle because as the range of products is expanded unit overhead costs (logistics, distribution, administration) falls making the company more competitive and reinforcing the company's profile.

4.2.8 Future tariff changes

All the firms interviewed were aware that tariff protection existed for their products. In this sense tariffs are an important issue for these companies, although by no means an overwhelming one.

A clear majority of those TCF companies interviewed accepted that further tariff reductions would occur and some were happy to see tariffs removed altogether. Three companies argued that any reduction in tariffs post 2005 would jeopardise their business.

At least two firms with substantial exports to Australia suggested that tariff reductions should pay heed to the Australian regime. They and others exporting to Australia have to contend with different tariff regimes unnecessarily complicating their businesses. Therefore greater harmonisation would be a useful outcome of any tariff review.

In addition to harmonisation with Australia, simplification of the tariff structure would also help streamline business operations. Consolidation of (TCF) tariffs at 15% was regarded by some as an acceptable first move.

Two companies involved in the manufacture of fabrics for the TCF sector were far less concerned about tariffs on fabrics than they were about tariffs on clothing. The real threat to their business was the possibility that lower tariffs on garments would force some of their local customers out of business.

The fact that there are some TCF companies that export at least some of their output beyond Australia suggests that some companies are becoming internationally competitive. (Bear in mind, though that the vast majority of exports are to Australia where there is a 25% tariff on third country imports.) The more internationally competitive firms become the more likely they are to withstand and accept lower tariffs because they



are competing on brand rather than price. This is true for three or four companies in this study.

Most companies saw tariffs as just one of a number of government-related issues they would need to pay heed to over the next few years.

Many companies argued that compliance costs were a bigger concern than the prospect of lower tariffs. One company that has suffered more than most as a result of tariff reductions employed a significant number of low paid workers who were entitled to various benefits. The company had to employ someone full-time to liaise with the welfare agencies - it was acting as an unpaid welfare administrator. If these and other costs associated with complying with government regulations were eliminated then tariffs at zero would not be a problem. But since this was not going to happen tariffs would remain important to the viability of the business.

4.3 Plastics

| | |
|------------------------|--------|
| Current tariff: (1999) | 6.5/7% |
| 1995 | 13% |
| 1990 | 18% |
| 1987 | 23.5% |

NB: *Tariff rates set out in this table and throughout the remainder of this report should be interpreted as indicative rather than precise.*

Two companies were interviewed – one in Auckland and the other in Christchurch.

4.3.1 Industry characteristics

There are four relatively distinct categories of plastics manufacture:

- Technical plastics
- Film
- Packaging
- Pipe

Film accounts for around 30% of industry output and has undergone some of the most dramatic changes including increased foreign ownership and loss of employment. New Zealand was once close to the leading edge of plastic film manufacture. That lead has disappeared as local companies have either sold out to foreigners or been squeezed out of business as tariffs have been reduced.

One company argued that the diverse nature of the industry means that a uniform tariff is not appropriate. Within the industry margins, markets, competition and ownership vary significantly. Even within firms different product lines can face very different market conditions.

Plastic companies are generally domestically oriented, partly because they enjoy a degree of natural protection (small, remote market for products with high freight cost component). Film products face the



biggest threat from imports. However, plastic products often end up as part of some other company's exports. It is an automated and capital intensive business working well beyond the standard 40-50 hour operating week.

Key demographics:

| | 1986 | 1996 | 2001 |
|-----------------------------|------|------|------|
| Weekly hours worked ('000s) | 328 | 327 | 334 |
| | 1989 | 1996 | 2001 |
| Exports \$m (HS 39) | 132 | 259 | 401 |
| Number of enterprises | | 560 | 545 |

4.3.1.1 Tariff freeze

The freezing of tariffs from 1999 through to 2005 has provided greater stability/ certainty in the industry and, as one company argued, may have been a factor in encouraging a lift in capital spending in the plastics industry over 2001.

4.3.2 Current strategy

Based on the two business interviewed the broad strategy is:

- to invest in good equipment, design and technical development
- try to sell on attributes other than price, for example, delivery, quality, innovation, service
- develop new products, areas of business
- develop export markets to deliver more rapid growth than is available from the domestic market.

4.3.3 Response to past tariff reductions

The two companies interviewed represent almost the two extremes within the response range. One simply reacted to the new circumstances by cutting costs (in an *ad hoc* fashion), restructuring product range as various lines became uneconomic. The other company could see the changes coming and prepared the company – they narrowed the product range, developed new products (and are still doing so) and established export markets.

The main common response has been a strong focus on new, specialised products. Research and product development are important aspects of both businesses today by comparison to ten years ago.

Although lower tariff protection has clearly squeezed already thin returns in other parts of the plastics industry, these two companies appear to have been left relatively unaffected in terms of their profits, and growth.

Neither company has been persuaded thus far to maintain or expand its range by importing product for sale through their New Zealand distribution channel.



4.3.4 Future tariff changes

The current low rate of tariff on plastics leaves little protection for domestic plastic manufacturers and is probably critical to those business making plastic film products. The two companies interviewed were not particularly concerned about tariffs being reduced or eliminated – one was not aware that a tariff still existed for the products they manufacture.

Cost of sale, capacity utilisation, the cost of raw materials, stability of customer base, technological change are all more important to these businesses than the level of the tariff.

However, for those plastics businesses operating with relatively thin margins - less than 10% - any reduction in tariffs is potentially critical. The most vulnerable part of the plastics business on this count would be the film category, which has been the most traumatised by falling tariffs over the past 15 years. The relatively high level of foreign ownership in this area of the plastics industry has two interesting implications for future tariff policy:

- Foreign owners are financially better equipped to ride financial stress imposed by institutional changes
- Partly because of their greater financial depth foreigners are more prepared to take big decisions such as shutting down manufacturing capacity in New Zealand and importing product to meet local demand.

4.4 Metal Products

| | | |
|-----------------|--------|------|
| Current tariff: | (1999) | 6.5% |
| | 1995 | 10% |
| | 1990 | 15% |
| | 1987 | 25% |

Three companies were interviewed – one in Auckland, Wellington and Wanganui. One was foreign owned with a turnover of more than \$50m, one was privately owned and independently managed, while the third was small and owner operated.

4.4.1 Industry characteristics

The metal products industry is diverse with a number of separately identifiable sub industries:

- iron and steel basic products, forgings, castings
- non-ferrous metal basic products, forgings and castings
- furniture and fixtures primarily of metal - joinery, fixtures and fittings
- sheet metal roofing and related products
- structural steel fabricating and plate metal and boiler shop products
- manufacture of household and kitchen utensils, general hardware and fabricated metal products (except machinery and equipment) nec
- wireworking, nails and fasteners



Key demographics:

| | 1986 | 1996 | 2001 |
|-------------------------------------|------|------|------|
| Weekly hours worked ('000s) | 1571 | 1160 | 1140 |
| | 1989 | 1996 | 2001 |
| Exports \$m (HS 73-83) | 982 | 1201 | 1737 |
| Number of enterprises ¹⁰ | | 3030 | 3493 |

4.4.1.1 Tariff freeze

The tariff freeze has not been particularly important to these businesses (useful according to one). Although it has slowed the encroachment of cheap imports, tariffs have been well down the list of management priorities within these firms.

4.4.2 Current strategy

Because tariffs are a relatively minor issue for the companies interviewed in this industry they do not feature as a factor in current strategies.

The dominant strategy appears to be to make niche products that incorporate difficult to replicate design and manufacturing techniques. In one case the business was persuading downstream users to redesign their products to meet the requirements of the component being supplied by the New Zealand business.

Exports are an important component of growth for two of the companies. The weight and relatively low value of metal products gives them a degree of natural protection. However, these factors also work against exporting the product and fast growing companies in this industry are likely to develop new production offshore to reduce transport costs.

4.4.3 Response to past tariffs reductions

Rather than try to generalise about businesses' responses across the metal products industry based on these three firms it seems more appropriate to highlight a particular response relevant to examining the firm-level effects of tariff changes.

A firm with a relatively wide range of products adopted a strategy of not attempting to match the price of imported product. In this sense it did not allow imports to erode its margins. The market was left to decide whether it would pay more for the local product. If it did not then the product was phased out.

So rather than proactively determine which product lines to concentrate on this business used the market to make these decisions. Such an approach may well have maximised the firm's revenue. Certainly any

¹⁰ Basic metal and sheet metal manufacturers



production that occurred was almost invariably sold at a reasonable margin.

In practice the range of products in this company has narrowed significantly, and turnover and employment is well down on the levels prevailing at the beginning of the 1990s.

Although tariff reductions were not seen by two companies as being relevant to how their companies developed over the past decade or so, for one company the impacts have been obvious. Whole product lines have been taken out by imports and overall production is just 30% of what it was in the mid-1980s.

Take-overs and the consolidation of production and product lines have occurred in this industry. They probably have not been driven by tariff reductions but rather the general rationalisation of activity as commercial pressures intensify.

4.4.4 Future tariff changes

All three companies interviewed were not particularly concerned about tariffs. The view was that there were more important issues confronting their businesses that are directly related to government policy than tariffs.

Policies such as:

- Accident insurance - premiums do not reflect the performance of individual businesses; no premium reduction for having a good accident record.
- Health and safety requirements - they are being changed and the company is having to review all its procedures to ensure they conform.
- Business assistance - find it difficult to qualify for assistance packages because they undertake technical development work rather than formal R&D, and the rest of the assistance appears to be very consultant intensive - little actual money to do things.
- Jury service - disruptive to a factory that is trying to be as efficient as possible.
- New apprenticeship scheme, TradeNZ and Biz Info - all regarded as valuable to business.

4.5 Food products

| | |
|------------------------|-----|
| Current tariffs (1999) | 7% |
| 1995 | 13% |
| 1990 | 20% |
| 1987 | 30% |

(typical tariff on breakfast cereals)

Two food related companies were interviewed for this case study.



The food products industry encompasses a wide range of grocery items. Fruit and vegetable preparation have generally faced a slightly lower rate of tariff protection since 1987 when their rate was 20% compared to 40% for breakfast cereals. The two rates are now 7% and 6.5% (fruit and vegetable preparations).

4.5.1 Industry characteristics

The food processing industry is dominated by big players in the dairy, meat and horticultural industries. In many cases there is no tariff protection for the products produced by these multi-million dollar turnover businesses, many of which are overwhelmingly export oriented.

Given the small size of the market and the relatively large supply of basic food ingredients in New Zealand we would expect even niche producers to be looking to exports for growth relatively early in their development.

Key demographics:

| | | | |
|--|------|------|------|
| | 1986 | 1996 | 2001 |
| Weekly hours worked ('000s) | 3063 | 2269 | 2353 |
| | 1989 | 1996 | 2001 |
| Exports \$m ¹¹ | 1371 | 2027 | 3292 |
| Enterprises (other food manufacturers) | | 1669 | 1892 |

4.5.1.1 Tariff freeze

The tariff freeze was not regarded as relevant to the businesses interviewed, and we doubt it would feature as a significant benefit for most food manufacturers. The rate of protection is low and food manufacturers are generally well placed to compete against imports of the same product. Import competition is not a big issue in this industry.

4.5.2 Current strategy

The main aspect of strategy occupying the two firms interviewed was the issue of scaling up their businesses to fulfil demand as they successfully expanded their share of the domestic market.

Quality and building personal loyalty to the product were also important facets of the companies' strategies. They were competing against much larger players in their particular markets, but differentiating their product and investing in their brand they are able to build a valuable market for themselves.

4.5.3 Response to past tariff reductions

Tariff protection has not been a significant factor in how these businesses have been run over the past five or so years. The level of tariff protection is relatively low and despite parts of this market being very price sensitive, neither company was concerned about tariffs being eliminated.

¹¹ Other food & beverages, national accounts, March years



An important point that emerged from one company was that the business would never have become established without the removal of import licensing, reductions to tariffs on key inputs and a number of other changes to the economic environment.

The ability to import key ingredients at reasonable prices as well as specific capital equipment to perform to the standards required in the food industry opened up the opportunity to start the business. Conditions have become easier as tariff protection has been lowered on key inputs to the business.

The competitiveness of the two businesses interviewed rested heavily on the brand. Building the brand and tailoring it to specific segments of their markets helped reduce the importance of price. And although the firms did not have a free hand in setting prices they were high enough to produce adequate to good margins.

4.5.4 Future tariff changes

Tariffs are positioned down the management priority list for both companies and this probably reflects the view of a majority of New Zealand food manufacturers. One argued, though, that any tariff reduction should pay regard to reciprocity issues.

The company that was most likely to be affected by a reduction in tariffs claimed that the exchange rate and tax treatment of local competitors were more important to it than possible tariff reductions. Results from the mail survey suggest this view is common across a wide range of companies.

4.6 Automotive Components

| | |
|------------------------|-------|
| Current tariffs (1999) | 10% |
| 1996 | 11.5% |
| 1991 | 25% |
| 1987 | 40% |

The following comments/ observations are based on three companies manufacturing product (generally replacement equipment) for the automotive industry.

The industry currently enjoys tariff protection of around 10%. That rate was around 35% in 1987 (some individual rates were as high as 40%) and fell to 25% in 1991 and 12.5% by 1996.

4.6.1 Industry characteristics

The industry has undergone massive change as the local vehicle assembly industry has been steadily scaled back and finally shut down over 1998/99. The changes have forced the surviving component manufacturers to reduce costs dramatically and to develop export markets for their products. Each of the companies interviewed now has significant export sales, ranging from 40% to 85% of total sales.



Foreigners, with internationally recognised brands own most of the remaining automotive component businesses in New Zealand.

Key demographics:

| | | | |
|-----------------------------|------|------|------|
| | 1986 | 1996 | 2001 |
| Weekly hours worked ('000s) | 889 | 563 | 485 |
| | 1989 | 1996 | 2001 |
| Exports \$m (HS 87) | 57 | 74 | 195 |
| Enterprises | | 1146 | 1254 |

4.6.2 Strategy

Quality and price are givens in the automotive market. All three companies regarded quality as crucial. Product performance as well as the degree of innovation embodied in the product were seen as important factors in maintaining the value of their brands, and giving the companies a competitive edge.

Two of the businesses have recently been given new responsibilities by their parent companies – one for the development of product for the US, and the other expansion of the New Zealand plant to supply product into Australia and the US.

Other important aspects of company strategy include a focus on efficiency of converting raw materials into finished products, rapid/ just-in-time delivery, and providing a wide range of product.

4.6.3 Response to past tariff reductions

One company enjoyed a “stroke of luck” by having a breakthrough product around the time tariffs began to fall rapidly. The product enabled it to compete effectively with cheaper imported product and therefore the decline in tariffs and demise of the vehicle assembly market have not been particularly significant for the business.

The other two companies undertook a mix of radical and incremental changes. The most obvious response to lower tariffs have been:

- The development of export sales
- Restructuring of the business to take costs out/ boost productivity
- Change the range of products – in one case expand the range to cover the market, and in the other the manufacturing plant has become more specialised, though the business imports a wide range of product
- The development of new products controls
- Keeping real downward pressure on suppliers

General economic reforms have been helpful in achieving some of the changes the company was compelled to make. The Employment Contracts Act was particularly helpful in achieving the required restructuring.



One company claimed that it was reasonably well prepared for the fall in tariffs. It started changing its operations in the late 1980s when it was obvious the business climate was going to change.

4.6.4 Future tariff changes

One company was completely indifferent to what happened to tariffs because the effect of lower, or no, tariffs would be insignificant for the business. This company enjoyed good margins on its product and an impressive return on capital. Its parent regarded the New Zealand operation as one of its investment jewels.

The other two companies were far more sensitive about further tariff reductions, with one arguing for the current tariff rate remaining in place while the other argued for slow and well-signalled change to enable the company to adjust. Both companies face clear competition from imports, and price is therefore a major determinant of the companies' profitability. One faces high fixed costs so throughput is critical to overall profitability.

The competitiveness of the two companies is vulnerable to a number of adverse events besides any further reduction or elimination of tariffs. The most obvious and potentially most potent threat to the two businesses is a further rise in the exchange rate.

The currency is important to the profitability of the two businesses, especially as the proportion of exports grows. One would be struggling to justify manufacturing in New Zealand if the exchange rate rose to more than 50c US.

4.6.4.1 Tariff freeze

The following comments are based on just one company but highlight the issues for companies looking at major investment decisions.

If there had been no tariff freeze the case for expanding the plant would have been much weaker and perhaps more importantly management would not have had the time to work on the case.

The business is under constant price competition from Asian producers both in export markets and in New Zealand and therefore is always searching for ways and means of surviving the squeeze of rising cost and stable to declining prices. Tariff reductions accentuate this squeeze.

The current expansion of the plant will lower unit cost structures (overhead costs pretty static), which will enable the business to better survive tariff reductions/ increased competition. But additional throughput/ sales are not guaranteed and therefore the tariff freeze is important.

The company views tariffs as a reasonable quid pro quo for the regulatory burden it carries operating out of New Zealand in competition with countries that put less emphasis on social and environmental issues. A carbon tax is yet another impost that will disadvantage the business in the face of imports, even though the local plant is one of the most energy efficient plants around the world.

The ability of the firm to reduce costs further is increasingly limited. Therefore the company's view is that the speed and degree of tariff reductions remain major issues for the business over the next five to ten



years. The company argues that whatever tariff changes are made, the slower the better to allow the business to achieve the increasingly marginal costs gains available.

Gains from here are almost solely in labour productivity - either they pay less or get labour to perform better. It is a constant struggle to be able to get labour to change to secure better productivity.

The firm indicated that any tariff changes should bear in mind what Australia does on tariffs, because differences can affect investment decisions and where to put new capacity. A lack of harmonisation could also open up scope for "laundering" product within the Australasian market. Although country of origin rules theoretically prevent such "laundering" the company argued that in practice it can and probably happen.

The firm argued that tariff statistical keys provide detailed information about imports, which can be very helpful in informing the domestic market about market shares and product supplies in certain segments of the market. That information would still be available from customs entry data in the absence of tariffs.

4.7 Interview guide

Company details:

4.7.1.1 Nature of your business (10 minutes)

What are the core activities of your business?

Is this a fully integrated business or a small component of a larger supply chain?

Are you an owner-operated business, public company, foreign owned?

4.7.1.2 Turnover now, five years ago, ten years ago (10 minutes)

Do you export any of your production?

If so when did you begin exporting (since 1990?)

What % of your turnover do you export?

Are imports a major share of your total sales – details?

Employment - how many people do you employ? (10 minutes)

Is your labour force 10% bigger/smaller than five years ago?

What are your most critical skill requirements?

Are you experiencing any significant skill/labour requirements?

4.7.1.3 Strategy (10 minutes)

What is your current business strategy?

What are the key determinants of your business's competitiveness – price, quality, technology, etc?



4.7.1.4 Response to tariff changes (30 minutes)

Provide details of tariff changes relevant for this particular business

How well prepared for the tariff changes was your business?

Did you make small/incremental changes to your business or did you change your strategy radically?

Identify the key changes in strategy that occurred as a result of reducing tariffs. These might include:

1. Narrowing the product range - developing a niche
2. Develop new products/ adopt new technology
3. Importing finished product
4. Move in to exporting to gain economies of scale with narrower range of products
5. Focusing on importing distribution and retailing
6. Contracting out manufacturing to lower cost countries
7. Radically restructuring production to cut costs
8. Drive to increase productivity (capital and labour)
9. Major changes in management/ ownership
10. Put real pressure on suppliers for better prices and performance
11. Buy out local competitors

What tariff/ non-tariff barriers do you face in your export markets?

4.7.1.5 Response to possible future tariff changes (20 minutes)

Are you affected by tariffs on any of your current inputs - elaborate

What are the factors that most affect your company's gross earnings:

- Volume of sales/ demand
- Exchange rate - changes the prices we can charge
- Competitor behaviour (related to the above two)
- Cost of sale - distribution, retailers' margins

At what level of the currency would your business become uneconomic (the higher the currency the less viable local production becomes)?

How profitable is your business (some idea of return on capital)?

What is the company's ratio of debt to equity (rounded to the nearest 10%)?

Outline possible scenarios -

- Tariffs remain the same
- Current tariff is halved? Cut by a third?
- Tariffs are consolidated around several key rates



Would you change your strategy as a result of a 20% reduction in your current rate of tariff?

If so, how would you change your strategy?

Obtain some idea about the relative significance of a 20% cut in tariffs versus say a 10% lift in the currency, a cut in the company tax rate and rise in interest rates.

Are you more concerned about the speed of possible changes in tariffs the extent of any potential change?



5 GENERAL EQUILIBRIUM ANALYSIS OF ALTERNATIVE TARIFF REGIMES

5.1 Approach

The way in which tariff scenarios are investigated with a general equilibrium model is by measuring the effects of an exogenous shock – a change in tariffs – relative to a “business as usual” scenario. The BAU scenario is intended to represent a plausible picture of the economy at some future point in time. Our horizon in this case is 2010. The BAU scenario is not intended to be a forecast as a general equilibrium model is not designed for forecasting. Its strength is in measuring relative comparative static effects rather than absolute effects; for example the change in imports when tariffs are reduced, rather than the starting level of imports.

A brief comparison of the main macroeconomic features of the BAU scenario in relation to 2001 are presented in Section 5.5.

In the sections below we look firstly at the effects of reducing all tariffs to zero by 2010. At the industry level the focus is on the TCF industries. To put this into perspective we then look at the effect of moving tariffs back to what they were around 1986/87. This is not intended as a plausible scenario for 2010. It is merely to demonstrate what 2010 might look like if there had been no changes in tariffs since 1986/87. We then present a brief discussion on how the results from the general equilibrium model can inform tariff policy after the current freeze ends on 2005.

The obvious criticism of this approach is that the 1995/96 inter-industry data used in the model already incorporates some of the effects that we are trying to model. Hence the simulation is likely to under-estimate the effects of the reduction in protection that have occurred since 1986/87.

5.2 Free Trade in 2010 – Scenario Specification

The following three scenarios are examined:

Run 1 – business as usual.

Run 2 – zero import tariffs; wage rates adjust to ensure the BAU level of employment, no change in real government consumption, personal income tax rates adjust to maintain fiscal balance, the real exchange rate adjusts to maintain the BAU current account balance.

Run 3 – as in Run 2 with real wage rates set at the BAU level so that employment is determined endogenously by the model.

5.2.1 Macroeconomic Results

The results of the simulations are set out in *Table 5.1 – Table 5.3*. Looking firstly at *Table 5.1*, it is clear that the macro-economy is not sensitive to the complete abolition of tariffs. This is because the size of the shock is much smaller than it seems. In the BAU scenario the revenue from tariffs is approximately \$314m and the mean rate of tariff on all manufactured goods combined (excluding petrol) is barely 1%.



Under zero tariffs GDP is projected to be 0.1% higher than in the BAU scenario. The increment in private consumption is imperceptible. With the removal of tariffs potentially causing a reduction in government revenue, personal income tax rates need to rise slightly to maintain fiscal balance. The mean income tax rate on households rises from 22.5% to 22.8%. This largely offsets the 0.35% rise in real wage rates, leading to static real private consumption. Other options for maintaining fiscal balance could also be analysed – for example lower consumption or lower welfare expenditure.

Removing tariffs does lead to lower prices throughout the economy, with the GDP deflator falling by one half of a percent. This improves international competitiveness such that exports rise by around 0.7%, which indeed is necessary to finance the increased demand for imports (as the external balance is prevented from deteriorating).

The Run 3 results are marginally more optimistic, simply because the reduction in prices is allowed to flow through into lower nominal wage rates, with real wage rates held constant. This reinforces the improvement in competitiveness, as manifested by the 0.2% rise in employment – about 3,500 FTE jobs.

For longer run horizons (of at least five years) the fixed employment assumption for closing the labour market is used more often by general equilibrium modellers, than the fixed real wage rate assumption. This is partly because use of the fixed employment assumption makes it easier to isolate the allocative effects of a policy change. It is also argued that the level of employment is ultimately determined by labour supply and demand, not by border protection policy – a reasonable enough stance, but not one which should be pursued too vehemently as it implies that no policies can ever affect the level of employment in the long run.

The two labour market closure assumptions are at opposite ends of a continuum. Undoubtedly a more realistic assumption would lie somewhere in the middle. However, for this particular policy shock, the difference in results is not material.

Macroeconomic Results

| | Run 1 | Run 2 | | Run 3 |
|------------------------|---------|------------------------------|-----------------|-------|
| | BAU | Zero Tariffs | | |
| | | Fixed Employment | Fixed Real Wage | |
| | \$m '96 | % change on BAU ¹ | | |
| Private Consumption | 82,738 | 0.01 | | 0.07 |
| Gross Investment | 29,704 | -0.04 | | 0.00 |
| Exports | 46,686 | 0.69 | | 0.76 |
| Imports | 46,160 | 0.44 | | 0.48 |
| Gross Domestic Product | 137,948 | 0.08 | | 0.14 |
| GDP Deflator | 1.000 | -0.53 | | -0.54 |
| Employment ('000 FTE) | 1760.1 | 0.00 | | 0.20 |
| Real Wage (Index) | 1.000 | 0.35 | | 0.00 |
| Household Tax Rate (%) | 22.52 | 22.81 | | 22.71 |

¹ Although these results are shown to two decimal places, this is spurious accuracy.

Table 5.1



5.2.2 Industry Level Effects

Industry specific results for the TCFL industries are shown in *Table 5.2* while results for other manufacturing industries are shown in *Table 5.3*.

Not surprisingly the largest changes are in the clothing and footwear industries. The mean tariff rates for these industries in the BAU scenario are 14.2% and 13.5% respectively. With the removal of this protection the shares of the market for clothing and footwear held by domestic manufacturers fall by 17% and 22% respectively.

Gross output in these two industries is lower by only about 8%. The reason that the fall in market share does not translate directly into an equivalent fall in output is that both industries also export. For Clothing the export-output ratio is about 39% while for Footwear the ratio is 52%. In addition there is an overall expansion in the demand for clothing and footwear (of around 4% and 5% respectively) as the prices of these goods decline relative to the prices of all other goods and services available in the economy.

Results for TCF Industries

| | Run 1 BAU | Run 2 | Run 3 Zero Tariffs |
|------------------------------|-----------------|--------|-----------------------|
| Gross Output | \$m '96 | | % change |
| Textiles | 1823 | -0.57 | -0.56 |
| Clothing | 1131 | -8.13 | -8.10 |
| Footwear | 180 | -8.08 | -8.05 |
| Leather | 632 | 0.10 | 0.16 |
| <i>Total</i> | 3,766 | -3.09 | -3.06 |
| Employment | '000 FTE | | % change |
| Textiles | 11.45 | -0.61 | -0.44 |
| Clothing | 13.080 | -8.26 | -8.03 |
| Footwear | 1.59 | -8.18 | -8.18 |
| Leather | 3.67 | 0.00 | 0.27 |
| <i>Total</i> | 29.790 | -4.30 | -4.10 |
| Domestic Market Share | ratio % | | % change |
| Textiles | 49.65 | -0.35 | -0.31 |
| Clothing | 42.12 | -17.16 | -17.13 |
| Footwear | 22.32 | -21.93 | -21.87 |
| Leather | 52.91 | -1.82 | -1.76 |
| Exports | \$m | | % change |
| Textiles | 598 | 0.73 | 0.79 |
| Clothing | 438 | 0.96 | 1.04 |
| Footwear | 93 | 1.11 | 1.18 |
| Leather | 468 | 0.75 | 0.81 |
| <i>Total</i> | 1597 | 0.82 | 0.89 |

Table 5.2

Note that the projected declines in output of 8% does not mean that output necessarily falls over time, merely that output under zero tariffs would be 8% lower



than under the current tariff regime. Spread over a five year period for example, the difference in the annual growth rate would be approximately 1.7%.

For the four TCFL industries combined the total fall in employment is around 1300 FTE positions, or about 4%. This is because the Clothing and Footwear industries account for a higher proportion of TCFL employment than they do of TCFL output.

In each of the individual industries the fall in employment is almost exactly the same as the fall in output. The small differences reflect a marginal increase in capital-labour ratios in Run 2 as wages rise relative to the cost of capital, and a marginal decrease in capital-labour ratios in Run 3 where wage rises are constrained.

Arguably one might expect an improvement in total factor productivity as protection is lowered. Evidence on this is difficult to obtain, but we examine this possibility in a later section.

For the other industries (*Table 5.3*) there is no change in gross output which exceeds 1%, positive or negative. A few industries see a decline in the market share as import penetration rises, but nonetheless experience small increases in output. Examples are Wood Products and Paper Products.

The industry that experiences the largest loss in market share to imported goods (outside of the TCFL industries) is Other Manufacturing, which includes furniture manufacture. Its market share drops by around 1% which is the main cause the 0.6% decline in industry output.

Results for Other Industries

| | Run 1 | Run 2 | Run 3 | Run 1 | Run 2 | Run 3 |
|----------------------------|----------------|--------------------------|-------|-----------------------|--------------------------|-------|
| | Gross Output | | | Domestic Market Share | | |
| | BAU \$m '96 | Zero Tariffs % change | | BAU ratio | Zero Tariffs % change | |
| Meat Processing | 6103 | 0.30 | 0.27 | 94.14 | 0.02 | 0.02 |
| Dairy Processing | 8177 | 0.26 | 0.25 | 97.48 | 0.01 | 0.02 |
| Other Food Processing | 9846 | -0.11 | -0.14 | 77.67 | -0.42 | -0.40 |
| Wood Products | 4514 | 0.20 | 0.26 | 93.05 | -0.05 | -0.04 |
| Paper and Products | 3928 | 0.27 | 0.35 | 67.69 | -0.18 | -0.15 |
| Printing & Publishing | 4432 | 0.11 | 0.17 | 78.63 | 0.05 | 0.06 |
| Petroleum | 1996 | -0.08 | 0.11 | 56.02 | -0.16 | -0.13 |
| Chemicals | 5007 | 0.06 | 0.11 | 49.34 | -0.18 | -0.15 |
| Rubber and Plastic | 2578 | -0.35 | -0.32 | 46.55 | -0.68 | -0.67 |
| Non-Metallic Mineral Prod. | 2030 | -0.02 | 0.03 | 77.82 | -0.05 | -0.04 |
| Base Metals | 2120 | 0.50 | 0.60 | 59.38 | 0.15 | 0.19 |
| Fabricated Metals | 3586 | -0.06 | 0.03 | 61.24 | -0.28 | -0.25 |
| Machinery & Equipment | 9858 | 0.27 | 0.36 | 30.18 | 0.00 | 0.04 |
| Other Mfg. | 2128 | -0.61 | -0.61 | 62.38 | -1.04 | -1.04 |

Table 5.3

5.2.3 Regional Effects

Section 2 presented the changes in employment in manufacturing industries over the period 1981 to 2001 by region, ethnicity, sex, household type and family income decile. With a few exceptions, little correlation with changes in tariffs was evident. This is likely to be because of other events which occurred simultaneously – changes in monetary policy and fiscal policy, the downturn in Asian economies, new employment law and so on.



The following tables show the changes in manufacturing employment from Run 2 on a regional basis. The changes are distributed over the regions *pro rata*, on the basis of the regional distribution of manufacturing employment in 2001. The implicit assumption therefore is that changes in employment in a given industry are proportionately spread over all regions where that industry exists. Thus any observed changes in regional employment are purely the result of differences in industry composition between regions, not to regional differences within industries.

Probably the best way to interpret the results is as a potential indication of regional susceptibility to changes in tariffs – other things equal. In a given industry less profitable firms will generally be the first to contract or close if they lose protection provided by import tariffs. Hence if there are significant differences in relative firm efficiency within an industry, the regional impacts of changes in that industry could be far from uniform

The large spike is in Mackenzie District (the bar between the Timaru and Waimate labels), but the absolute numbers involved here are very small.

Excluding Mackenzie District, the districts of Horowhenua, Carterton, and South Wairarapa, and to a lesser degree Waitakere City are where the biggest changes occur. However, none of the changes exceed 1.0 percentage point, although again the small size of the industry in places such as Carterton and South Wairarapa means that the closure of a single operation could lead to reductions in employment of much more than 1%. Similar results occur for Run 3.

Overall the impression gained from *Figure 5.1* is that in all but a few regions, any regional dislocation caused by further tariff reductions is unlikely to be noticeable above the effects of other economic developments that can be expected to occur, even if differences in intra-industry efficiency mean that firm closures are more uneven than implied by a simple *pro rata* regional allocation of changes in employment. This continues the historical trend evident in Section 2 that tariff reform has been, and will continue to be a minor contributor to the dislocation costs associated with improving the competitiveness of the New Zealand economy.



Change in TCF Share of Manufacturing Employment by Region: Run 2

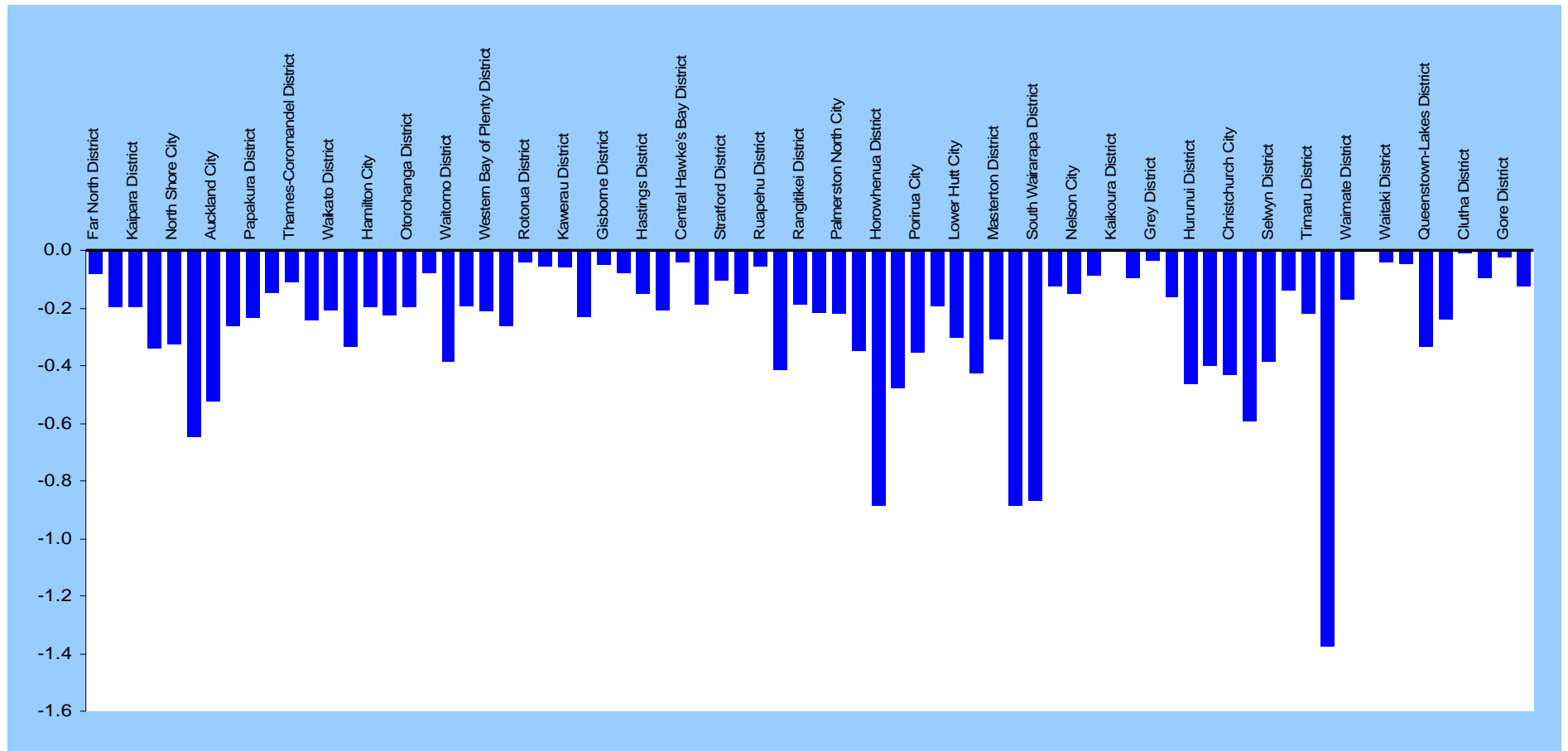


Figure 5.1



5.3 Historical Tariff Changes

To put the results of Runs 2 and 3 in perspective, we can estimate the effects of tariff changes to date. Ideally this should be done by basing the model in a period prior to the start of the decline in tariffs which has taken place over the last decade and a half, and then modelling that decline. This sort of exercise is beyond the scope of the current study, but as a proxy we run the model for 2010 as if there had been no tariff reductions. The results can then be compared with the BAU scenario.

We should stress that this is by no means a plausible projection of what the economy might look like in 2010. It is merely an artifice, a means by which the effect of past tariff reduction can be examined.

For our starting level of protection we have used the rates of tariff which prevailed in 1986/87. This year is not the high point in New Zealand's import protection regime, but by this time most border protection was in the form of tariffs, with import licences starting to be sold in tender rounds (thereby providing an estimate of their tariff equivalent). It is the earliest year for which we have reasonably reliable data. The approximate tariff profile in 1986/87 is shown in *Table 5.4*. (This data was estimated from the 1986/87 inter-industry study and thus may not match the data used in Section 2.)

We look at three scenarios, all relative to the BAU:

Run 4 – 1986/87 tariffs; wage rates adjust to ensure the BAU level of employment, no change in real government consumption, personal income tax rates adjust to maintain fiscal balance, the real exchange rate adjusts to maintain the BAU current account balance.

Run 5 – As in Run 4 with New Zealand exports as price takers.

Run 6 – As in Run 4 with real wage rates set at the BAU level so that employment is determined endogenously by the model.

Approximate Mean Tariff Rates 1986/87

| Industry | Tariff | Industry | Tariff |
|---------------------------|--------|----------------------------|--------|
| Mixed Livestock & Crops | 0.0009 | Paper and Products | 0.0663 |
| Other Agriculture | 0.0207 | Printing & Publishing | 0.0230 |
| Meat Processing | 0.0093 | Petroleum | 0.0539 |
| Dairy Processing | 0.0786 | Chemicals | 0.0433 |
| Other Food Processing | 0.0739 | Rubber and Plastic | 0.1249 |
| Textile Manufacturing | 0.0353 | Non-Metallic Mineral Prod. | 0.0575 |
| Clothing Manufacture | 0.3825 | Base Metals | 0.0386 |
| Footwear Manufacture | 0.3868 | Fabricated Metals | 0.0392 |
| Other Leather Product Mfg | 0.1041 | Machinery & Equipment | 0.1217 |
| Wood Products WOOD | 0.0589 | Other Mfg. | 0.1351 |

Table 5.4

Run 4 shows a reduction in GDP of about 0.3%. In other words had the tariff regime which prevailed in 1986/87 still existed, the gain in 2009/10 from reducing tariffs from their 1986/87 levels to their actual current rates is 0.3% of GDP. This equates to



around \$414m in 1995/96 prices, or about \$300 per household. As noted earlier though, the use of the 1995/96 inter-industry table probably biases this result downwards.

It will be seen that private consumption is actually somewhat higher than in the BAU. This is a common result in general equilibrium modelling of tariff changes because of the inclusion on downward sloping export demand curves.¹² Higher tariffs raise industry cost structures and this leads to a marked decline in the volume of exports, but those exports are sold at a higher price; the terms of trade rise by 1.96% in Run 4. Higher terms of trade translate into higher Effective GDP and thus higher domestic absorption.

Macroeconomic Results for 1986/87 Tariffs

| | Run 1 BAU \$m '96 | Run 4 Fixed Employment | Run 5 Approx 1986/87 Tariffs % change on BAU + Fixed Terms of Trade | Run 6 Fixed Real Wage |
|------------------------|-------------------------|------------------------------|---|-----------------------------|
| Private Consumption | 82,738 | 0.27 | -0.56 | -0.40 |
| Gross Investment | 29,704 | 0.43 | -0.37 | -0.08 |
| Exports | 46,686 | -4.45 | -4.53 | -5.10 |
| Imports | 46,160 | -2.89 | -5.08 | -3.31 |
| Gross Domestic Product | 137,948 | -0.29 | -0.26 | -0.88 |
| Terms of Trade | 1.000 | 1.96 | 0.00 | 2.26 |
| Employment ('000 FTE) | 1760.1 | 0.00 | 0.00 | -1.30 |
| Real Wage (Index) | 1.000 | -1.58 | -1.99 | 0.00 |
| Household Tax Rate (%) | 22.52 | 20.21 | 20.47 | 20.91 |

Table 5.5

In Run 5 this effect has been nullified by forcing New Zealand exporters to sell at the world price. The result is drop in private consumption which is twice the size (in absolute terms) of the gain seen in Run 4. This is reflected in imports which decline by 5% compared to 2.9% in Run 4.

Another key assumption in Run 4 is that the real wage adjusts to maintain employment at the BAU level. In other words, no compensation is sought in gross wage rates for the rise in consumer prices brought about by the increase in tariffs. This requires a drop in real wage rates of 1.6% (and 2% in Run 5).

Run 6 looks at the situation when real wage rates are held at BAU level. (Note that the fixed terms of trade assumption in Run 5 does not apply.) Mirroring the changes between the two free trade runs (2 and 3), holding real wage rates fixed leads to a drop in competitiveness. This feeds through into lower levels of economic activity with exports down by 5.1%, employment down by nearly 23,000 FTEs, private consumption down by 0.4% and GDP down by 0.9%.

¹² See for a example Productivity Commission 2000, "Modelling the Effects of Removing General Tariffs," Supplement to Inquiry Report, *Review of Australia's General Tariff Arrangements*, Productivity Commission, Canberra, July, p19.



5.3.1 Dynamic Effects

A criticism of this type of modelling is that it fails to take more subtle and dynamic changes into account. For example with respect to the labour market closure assumptions, is it possible to comment on which of the two extremes (Runs 4 and 6) is the more realistic? A common characteristic of protection regimes is that they encourage rent seeking behaviour, not just in this particular sphere, but more generally as economic agents (exporters, manufacturers, labour groups etc) realise that with enough lobbying it may be possible to secure economic privileges and advantages over competitors favours. This is likely to extend to wage bargaining as more protected economies are susceptible to a cost-plus mentality.

One of the rationales for removing protection is that governments can signal that they are not (or are no longer) in the business of granting politically expedient favours. Non-competitive behaviour in one area of the economy is more difficult if other areas of the economy are becoming progressively more competitive. Accordingly the power of labour organisations to artificially maintain or enhance real wages is less in an open economy, implying that the behaviour of the labour market is not invariant to the level of protection, fitting more into the 'fixed real wage' behaviour in a situation of high tariffs.

Another facet of protected economies is that they are thought to be less efficient – not just in terms of allocative efficiency (the standard framework for studying the effects of a tariff), but also in terms of productive and dynamic efficiency. If this is the case then a reduction in tariffs produces not only a level shift in the long run rate of economic growth, but also raises the growth rate itself. Evidence for this is scarce, but some recent research for the Australian Productivity Commission¹³ produced estimates for the elasticity of the percentage change in value added in response to a given change in industry assistance. These are shown in *Table 5.6*

Concepts of Efficiency

Reallocating resources from low productivity import substitution industries to high productivity export industries corresponds to an increase in allocative efficiency. Within a given firm or industry, there is no change in the volume of labour and capital inputs required to produce a given volume of production. That is, productive efficiency is unchanged. Increasing productive efficiency means that the same amount of output can be produced with a lower volume of inputs. If either of these changes in efficiency – allocative or productive – gives rise to more efficient investment, more innovation and higher productivity growth, then there is also a rise in dynamic efficiency. This is manifested in a change in the rate of growth over time, not just a shift in the level of the growth path.

¹³ *op cit* pp 63-65.



Effect of a 1% Change in Assistance on Value Added

| Industry | Elasticity | Industry | Elasticity |
|-------------------------------|------------|------------------------|------------|
| Food, Beverages and Tobacco | 0.02 | Basic Metals | 0.16 |
| Textiles, Clothing & Footwear | 0.63 | Structural Metal Prods | 0.28 |
| Printing etc | 0.28 | Transport Equipment | 0.29 |
| Petroleum etc | 0.01 | Other | 0.23 |

Table 5.6

Table 5.7 shows the macroeconomic results of testing these findings in the context of Run 6. The relative changes between Runs 6 and 7 could be applied to Run 5 to estimate the effects of lower productivity in the fixed employment context.

Macroeconomic Results for 1986/87 Tariffs and lower total factor productivity

| | Run 1 | Run 6 | Run 7 |
|------------------------|---------|-------------------------|-------------|
| | BAU | 1986/87 Tariffs + Fixed | Real Wage |
| | | | - Lower TFP |
| | \$m '96 | % change on BAU | |
| Private Consumption | 82,738 | -0.40 | -0.68 |
| Gross Investment | 29,704 | -0.08 | -0.31 |
| Exports | 46,686 | -5.10 | -5.23 |
| Imports | 46,160 | -3.31 | -3.45 |
| Gross Domestic Product | 137,948 | -0.88 | -1.11 |
| Terms of Trade | 1.000 | 2.26 | 2.28 |
| Employment ('000 FTE) | 1760.1 | -1.30 | -1.37 |
| Real Wage (Index) | 1.000 | 0.00 | 0.00 |
| Household Tax Rate (%) | 22.52 | 20.91 | 21.00 |

Table 5.7

The estimated productivity effect increases the loss in GDP attributable to the higher tariffs by about 25%, although in absolute terms the effect is small. The total change in GDP (in Run 7) amounts to \$1500m in 1995/96 prices. This is roughly \$1100 per household per annum, or about \$21 per household per week.¹⁴

5.4 Conclusion

Runs 2 and 3 illustrate the effects of the largest possible reduction in tariffs, that is moving to zero tariffs. Thus it is reasonable to assume that partial reductions in tariffs would yield even smaller effects than those observed for Runs 2 and 3, although there is a possibility that uneven reductions could lead to some unexpected industry or regional effects.

¹⁴ The NZIER estimated a similar figure of \$22/week in household spending power. See *Consumer benefits from import liberalisation: A New Zealand Case Study*, NZIER, for Ministry of Foreign Affairs and Trade, June 1999.



Nevertheless we would have to conclude that the macroeconomic effects of a partial reduction in tariffs from their current levels are too small to be identified with a (neoclassical) general equilibrium model. Even on the assumption that there would be some dynamic efficiency gains, the macroeconomic gains are unlikely to exceed 0.1%.

Accordingly arguments in support of further reductions in protection really need to be sought elsewhere. For example:

- administrative costs of maintaining and enforcing tariff schedules,
- compliance costs to importers (who are often also manufacturers),
- further reducing the perception that some industries are favoured by government for no obvious reason.

Lest this be interpreted as a case for raising tariffs, the model results make it clear that increasing tariffs does not enhance welfare. The simple point is that New Zealand has secured most of the gains from lower import protection already; firstly by the removal of import licensing, secondly by bringing down the 'tall poppies' and thirdly by lowering the entire tariff profile to the point where the mean price of goods imports is about 1% higher than what it would be without tariffs.¹⁵ The additional gains from a possible fourth stage – free trade – are small by comparison.

¹⁵ The Swiss formula approach delivered most of the gains under these last two stages.



5.5 Appendix: The Business as Usual Scenario

Policy analysis with a general equilibrium model requires a baseline against which policy shocks may be compared, much like a scientific experiment requires a control population. The Business as Usual (BAU) scenario fulfils this purpose. It is intended to represent a plausible picture of the economy in 2010 without any major policy changes or major international events. It is not intended to be a forecast of 2010.

The model consists of a set of unknown variables (prices and quantities etc) and a set of behavioural equations which determine those variables. To solve the model the number of variables should equal the number of equations. However, some parts of the economy are not well enough understood to be represented by an equation. The processes by which wages are set is an example. In addition, other parts are 'exogenous' in the sense that they are (largely) determined outside the system. Examples include government policy such as the tax regime, and international factors such as oil prices.

Hence to produce a BAU scenario a number of assumptions are required. The most important of these relate to total factor productivity and export demand. The latter is modelled as shifts in demand curves with the model choosing the price-quantity supply mix for each commodity.

Factor Productivity – Business as Usual

| Factor | Industry | % pa |
|----------------|-----------|------|
| <i>Labour</i> | Primary | 3.62 |
| | Secondary | 0.2 |
| | Tertiary | 1.04 |
| <i>Capital</i> | Primary | 1.82 |
| | Secondary | 1.38 |
| | Tertiary | 1.32 |

Table 5.8

The macroeconomic results are shown in *Table 5.10*. Gross domestic product and private consumption both rise at about 3% pa, with somewhat faster growth in exports and investment. Employment (in FTE jobs) expands by 1.6% pa, which lowers the unemployment rate to 5.5%. On a per capita basis, GDP rises by 2.5% pa.



Export Growth – Business as Usual

| | Actual | Estimated | | BAU 2010 | |
|---|-----------------|-----------------|---------------|--------------|---------------|
| | \$m '96 1996 | \$m '96 2001 | % pa 96-01 | 2010 | % pa 1-Oct |
| 1 Dairy | 2827 | 4545 | 9.97 | 5489 | 2.1 |
| 2 Meat | 2643 | 2744 | 0.75 | 3111 | 1.4 |
| 3 Wool | 1156 | 1116 | -0.69 | 1333 | 2 |
| 4 Horticulture | 1334 | 1581 | 3.46 | 2293 | 4.2 |
| 5 Fish | 1137 | 955 | -3.44 | 1034 | 0.9 |
| 6 Other Food, Beverages, Tobacco | 1255 | 1655 | 5.68 | 2274 | 3.6 |
| 7 Textiles and Leather | 966 | 1325 | 6.53 | 1701 | 2.8 |
| 8 Clothing and Footwear | 191 | 245 | 5.08 | 281 | 1.5 |
| 9 Logs | 753 | 976 | 5.32 | 1276 | 3 |
| 10 Wood and Wood Products | 859 | 1218 | 7.22 | 1569 | 2.9 |
| 11 Paper and Printing | 1045 | 1208 | 2.95 | 1357 | 1.3 |
| 12 Oil | 211 | 220 | 0.82 | 226 | 0.3 |
| 13 Chemicals, Plastics & Rubber | 1851 | 2425 | 5.55 | 3326 | 3.6 |
| 14 Coal | 92 | 102 | 1.99 | 135 | 3.2 |
| 15 Mining (Iron, Gold) | 321 | 333 | 0.74 | 337 | 0.1 |
| 16 Ceramics | 41 | 43 | 0.74 | 47 | 1 |
| 17 Aluminium and Steel | 1386 | 1505 | 1.67 | 1522 | 0.1 |
| 18 Fabricated metals, machinery equipment | 1537 | 2678 | 11.75 | 4236 | 5.2 |
| 19 Other Manufacturing | 140 | 182 | 5.41 | 240 | 3.1 |
| 20 Tourism | 4897 | 5797 | 3.43 | 10007 | 6.3 |
| 21 Freight | 1200 | 1383 | 2.88 | 1691 | 2.3 |
| 22 Education | 251 | 568 | 17.74 | 973 | 6.2 |
| 23 Other Services | 756 | 1393 | 13.01 | 2228 | 5.4 |
| <i>Total</i> | <i>26850</i> | <i>34198</i> | <i>4.96</i> | <i>46686</i> | <i>3.5</i> |

Table 5.9

Macroeconomic Results (\$m 1995/96)

| | 2001 | 2010 BAU | |
|------------------------|--------|----------|------|
| | \$m | \$m | %pa |
| Private Consumption | 63666 | 82738 | 2.95 |
| Investment | 21559 | 29704 | 3.63 |
| Government Consumption | 18328 | 23676 | 2.89 |
| Stock change | 1122 | 1303 | 1.68 |
| Exports | 34198 | 46686 | 3.52 |
| Imports | 32688 | 46160 | 3.91 |
| GDP | 106183 | 137947 | 2.95 |
| Capital Stock | 309006 | 374304 | 2.15 |
| Employment ('000 FTE) | 1523 | 1760 | 1.62 |
| Labour force ('000) | 1620 | 1863 | 1.57 |
| Unemployment rate | 6.0% | 5.5% | |
| Population ('000) | 3839 | 4263 | 1.17 |
| GDP/capita (\$) | 27,659 | 32,359 | 2.52 |

Table 5.10