Regional Consequences of New Zealand Industry Assistance Policies

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The divergent growth rates of New Zealand regions are a matter of concern to economists, geographers and policy makers. People have been concerned about the 'drift to the north' since at least the 1920s. Geographers have paid particular attention to the role of manufacturing industry in explaining the growing hegemony of Auckland (Taylor and Hosking, 1979), and in generating regional inequalities through differential wage payments (Hoare, 1986). They have also analysed the regional development policies put in place at various times in response to concerns about these divergent growth rates (Le Heron, 1979; Scott, 1980).

This literature largely overlooks a significant cause of regional growth and decline. The omitted cause is industry protection policies such as import licensing, tariffs, and export subsidies. Scott (1980) hinted at the role that these policies play in creating regional imbalances but provided no supporting analysis. Some regional implications of the 1980s process of protection reform were noted by Patterson (1989) but it was St Hill (1987) and Treasury (1987) who provided the most comprehensive analysis. These studies found that Auckland, Lower Hutt, Wellington, and Christchurch were favoured by having a high concentration of protected, import-substitute manufacturing. Provincial regions were less favoured because their industries tended to be export oriented ones which received lower levels of assistance.

The aim of this paper is to describe further the regional costs and benefits of industry protection policies. These costs will be measured in monetary and employment terms under a variety of assumptions. The results suggest a paradox. Regions suffering the heaviest burden under industry protection policies were generally 'priority regions' for enhanced development. The penultimate section of the paper gives some reasons for this paradox. First, however, I outline ways in which assistance to industries and regions can be quantified. Then regional rates of assistance during the 1980s are measured. The earliest available data (1981/82) are used to make inferences about the pattern of costs and benefits before the current liberalisation. The initial impact of the liberalisation is assessed using data from the late 1980s.

CONCEPTUAL ISSUES IN MEASURING INDUSTRY ASSISTANCE

Increasing the price of an import with a tariff or reducing the supply with an import licence (enabling a higher 'scarcity' price to be charged) leads to an increase in the price of domestic substitutes. If imports and domestic goods are perfect substitutes the increased import price leads to an equally increased domestic price. Comparing the new price with the old one gives a simple measure of protective effect, the *nominal rate of assistance.* For example, a product could previously be imported and sold for $10. A tariff increases its price by $2. The price of the domestic substitute also increases by $2, so the nominal rate of assistance to local industry is 20 percent.

The extra income that an industry earns from higher prices could also have been provided by the government directly paying a subsidy. This gross *subsidy equivalent* (GSE) provides a monetary measure of assistance levels. For example, the New Zealand manufacturing sector was protected from imports in the early 1980s at a level equivalent to an annual subsidy of $3 000 million (Syntec, 1988). Protection also has a direct effect on the cost of production because some firms buy intermediate inputs whose price may have increased due to tariffs. This extra cost effectively taxes the consuming firm and thereby partially offsets the protection given to its output product. The equivalent subsidy to recreate the net effect of the output assistance and input tax is the *net subsidy equivalent* (NSE). This was estimated to be $2 180 million per annum for the New Zealand manufacturing sector in the early 1980s (Syntec, 1988).

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It is useful to compare the net subsidy equivalent for an industry or region with some measure of the size of that particular unit. This is because an important industrial region like Auckland will naturally have a large net subsidy. By scaling that net subsidy to some size measure we learn whether manufacturing industries are, on average, subsidised either more or less in Auckland than elsewhere. A good denominator is the amount of value that would be added during local processing, without any assistance, the *unassisted value added* (UVA).

The resulting protective measure is:

$$\textit{Effective Rate of Assistance} = \frac{\textit{Net Subsidy Equivalent}}{\textit{Unassisted Value Added}}$$

This effective rate of assistance (ERA) can be either positive or negative, depending on whether the combined effect of protection for its output and implicit taxation on its inputs helps or harms the industry. For example, the average ERA for manufacturing in 1981/82 was 39 percent, suggesting that manufacturing value-added was inflated by over one-third compared with world prices. However, the minimum was - 17 percent for dairy factories, suggesting that this industry was disadvantaged. It must be emphasised that the ERA from the Syntec (1988) only measures the interrelationships within the manufacturing sector.

The interrelationships within the whole economy are measured by the *true rate of protection. To* understand this measure it is helpful to think of the economy in terms of three sectors: exportables, importables, and home goods (Figure 1). Home goods are products that do not enter international trade. They include the retail and wholesale industries, education and public services, domestic transport, and utilities. Exportables and importables-cofiectively the traded goods sector-are goods that can be internationally traded. The exportables sector produces for the world market and in New Zealand includes agriculture, fishing, forestry, mining, and some manufacturing industries (food processing, textiles, paper products and metal smelting). The importables sector produces for the home market, competing with imports. It includes the rest of manufacturing.

Figure 1 shows what happens with import protection. Prices rise in the importables sectors, causing export firms to pay more for their inputs (such as tractor tyres). A larger indirect effect follows. The increased price of importables leads to consumers buying more home goods, which have become cheaper relative to imports and importables. Meanwhile, newly protected producers of import substitutes bid mobile resources out of other sectors. Increased demand and reduced supply raises the price of home goods (including labour). These prices act as a further implicit tax on export firms who cannot increase their prices because of foreign competition. Note also that rising prices for home goods and labour increase input costs for importables, whittling back some of the value added increase that import protection appeared to provide.

How much the price of home goods rises depends upon how readily the tradeable and home goods are substituted for each **other. Wong (1989)** found that a ten percent tariff would

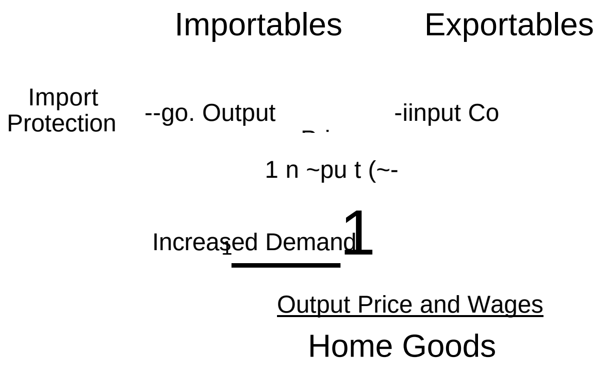


Figure 1 - The three sectors of the economy

increase home goods prices in New Zealand by approximately 7.5 percent. Conversely, a ten percent subsidy for export productions would only increase home goods by 2.5 percent].

It is important to consider the effects on the whole economy outlined by Figure 1 because true rates of protection are often quite different from nominal or effective rates. For New Zealand in the early 1980s the exportables sector was subsidised at a rate of ten percent. The importables sector had a nominal tariff of 28 percent. Wong (1989) found that the net effect was to increase the prices of home goods by 24 percent, giving a true tariff to importables of only three percent and a true subsidy to exportables of - 11 percent. These true subsidies and tariffs are calculated as follows:

$$\textit{True Tariff} = \frac{0.28 - 0.24}{1 + 0.24} = 0.03$$

$$\textit{True Subsidy} = \frac{0.10 - 0.24}{1 + 0.24} = -0.11$$

Despite the considerable reform of industry assistance during the 1980s this balance between the two sectors had hardly changed by 1988. This is because the earlier and more comprehensive removal of agricultural supports and export incentives reduced the cost burden on import-competing manufacturing at a similar rate to the reduction in assistance for manufacturing output.

The finding that the exportables; sector had a negative subsidy shows that it is ultimately export industries who pay the price for assistance to import-substituting manufacturers. So regions which specialise in export production are relatively impoverished by the assistance granted to import-competing manufacturing.

ESTIMATES OF REGIONAL IMPACTS OF INDUSTRY ASSISTANCE

All the measures of assistance discussed have been. used mainly to measure variability between industries. However they can be adapted to measure the effect on geographical areas. The first approach uses the level of subsidy provided to each of the 132 manufacturing industries examined by Syntec (1988) .2 Data on the distribution of each industry amongst the 13 Statistical Areas was used to partition assistance, and these estimates were aggregated to form regional totals.

Table 1 shows the regional breakdown of manufacturing industry assistance in 1981/82. Wellington had the highest rate of assistance with manufacturing output value being 27 percent higher and value added being 56 percent higher due to import protection. These assistance rates were equivalent to an annual gross subsidy of $630 million and a net subsidy of $442 million. Central Auckland had the next highest rate of assistance and the largest implied subsidy.

Comparing implied subsidies and assistance rates provides interesting insights into regional differences in manufacturing. The three areas receiving the largest subsidies were also the most highly assisted. Beyond that the pattern becomes more complex. Manufacturing in the Waikato/Bay of Plenty area had the fourth largest implied subsidy but only a low rate of assistance. This reflects the recent manufacturing development in this region, specialising in relatively unassisted paper products and dairy processing. On the other hand, Otago had a much smaller manufacturing base and a lower value of subsidies but was assisted at a higher rate. This reflects the greater age of Otago manufacturing, with specialisation in more traditional, highly protected import-competing activities such as clothing, textiles and machinery.

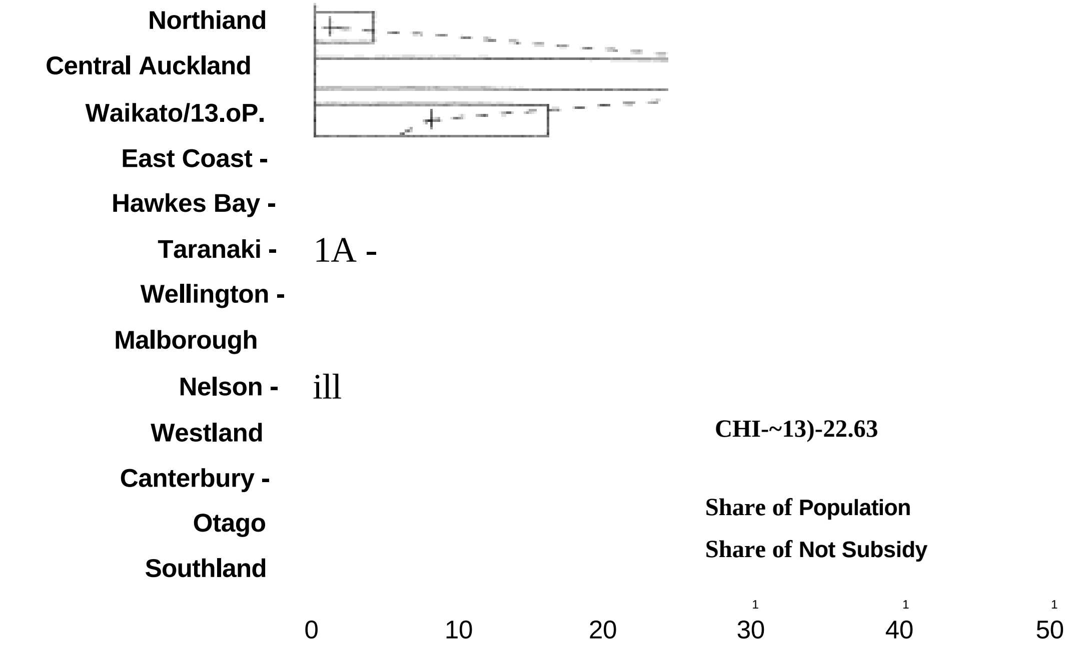
Northland and Southland had the lowest rates of assistance with manufacturing value added being about 12 percent higher than it would have been at free trade prices. However, some assistance to these two areas may not have been included in the Table 1 results. Specifically, the regulatory protection for the Marsden Point oil refinery and the (possibly) concessional electricity prices for the Tiwai Point aluminium smelter are not included in the measure of assistance. This inability to measure industry-specific arrangements is one weakness of the Syntec estimates.

TABLE 1

RATES OF ASSISTANCE AND IMPLIED GROSS AND NET SUBSIDY TO MANUFACTURING BY STATISTICAL AREA 1981/82

Statistical Area	*Gross Subsidy Equivalent]* ($ million per annum)		*Net Subsidy Equivalent2* ($ million per annum)	
Northland	37	(9)	20	(12)
Central Auckland	1224	(25)	928	(51)
Waikato/Bay of Plenty	293	(12)	178	(20)
East Coast	21	(17)	18	(33)
Hawkes Bay	91	(14)	73	(26)
Taranaki	68	(12)	35	(18)
Wellington	630	(27)	442	(56)
Marlborough	15	(14)	11	(27)
Nelson	49	(18)	33	(33)
Westland	10	(13)	7	(23)
Canterbury	305	(21)	300	(42)
Otago	129	(19)	106	(39)
Southland	44	(7)	31	(12)
Total	3008	(20)	2182	(39)

1 Nominal Rate of Assistance (01o) in brackets
2 Effective Rate of Assistance (%) in brackets
Source: Syntec (1988) and New Zealand Census of Manufacturing, 1981/82, Series B, 1.



Source: Syntec (1984). New Zealand Conaus of Pbpulation.l*al

Figure 2 - Regional division of the net subsidy equivalent

The Table I results are also deficient in not providing a basis for estimating interregional wealth transfers. There is no evidence about where the implied subsidy to manufacturing in each region came from. One way of considering the interregional wealth transfers is to imagine what would happen if the various trade policies were replaced with a subsidy. Figure 2 shows the regional division of the net subsidy equivalent. Central Auckland had the largest share with 43 percent, followed by Wellington with 20 percent and Canterbury with 14 percent.

Assuming that tax revenue has the same regional pattern as population let us make a comparison between the sources and the recipients of the subsidy. Figure 2 shows that Central Auckland, Wellington and Canterbury all had higher shares of the manufacturing subsidy than of population. This was offset by lower shares for all other regions. A chi-squared goodness of fit test showed that the distribution of the net subsidy equivalent was different from the distribution of population at the five percent statistical significance level.

The largest recipient of interregional wealth transfers under this set of assumptions was Central Auckland. The largest donors were Northland, Waikato/Bay of Plenty, Hawkes Bay and Southland. Ironically, Northland and Southland were ,priority regions' for regional development.

TRUE REGIONAL RATES OF ASSISTANCE

Another way of considering the interregional wealth transfers is to focus on price increases induced by protection. As Figure 1 illustrated, protection increases economy-wide prices, but at different rates for various sectors. Sectors with low price rises -such as exportables -end up being taxed by cost increases and have a reduced ability to compete for domestic resources. By similar reasoning the industrial mix of each region will affect the ability of that region to hold, or to attract, resources. Regions with a high concentration of importables or home goods production will be relatively favoured because the price of their ,representative output' will have risen by more than the average. Not surprisingly (given the location of central government) Wellington was the most home goods-oriented region, with 72 percent of 1981 employment in this sector. Central Auckland was the most import-competing region with 22 percent of its workforce in the importables sector. Provincial areas had the highest export orientation. The exportables sector accounted for 40 percent of East Coast employment, 38 percent of Southland employment and 34 percent of Taranaki employment.

The economy-wide price increase due to protection and export subsidies was 20 percent in 1981/823 . It is also possible to define a regional 'price' increase based on the relative importance of exportable, importable, and home goods industries for each region. This 'price' increase was lowest for Southland (16 percent) and highest for Cental Auckland (22.4 percent). These ,price' increases were used to derive the true subsidy rates presented in Table II. The 'foregone output' for each region is also calculated. This is the difference between actual regional output (measured at assisted prices) and the output that region could achieve if its 'price' rise was the same as the economywide average. This of course is a notional figure but it helps to show the directions and magnitudes of the inter-regional wealth transfers4.

The inference from Table II is that industry assistance in 1981/82 caused a one to 11 percent subsidy to the three main metropolitan areas and a tax on all other areas of somewhere between one and four percent. The 'foregone output' column suggests that Central Auckland, Wellington, and Canterbury would have had lower output if protection acted equally across all regions. Conversely, all other regions would have had higher output by considerable amounts for Waikato and Southland. These estimates, although based on a somewhat notional scenario, suggest that the wealth transfers caused by industry assistance policies penalised provincial regions. Many of these taxed areas were 'priority regions' for regional development and it seems likely that the transfers exceeded regional development expenditures going in the opposite direction.

CHANGES SINCE THE EARLY 1980s

The results in Table two suggest that the same pattern of regional costs and benefits was apparent in 1986/87. Sometimes the regional tax rates increased (Nelson, Westland, Southland) suggesting that the initial effect of liberalisation was to disadvantage further some provincial regions. This was most likely due to the much faster removal of agricultural subsidies and export incentives compared with import protection. This period also saw a reduction in other, more covert, forms of government assistance -disguised unemployment in forestry and railways, and subsidised services such as telecommunications and post. Thus, although moves were made in the 1980s to reduce regional subsidy/tax imbalances, the initial result worsened the bias against the provinces.

TABLEII
TRUE SUBSIDY RATES AND FOREGONE OUTPUT OF STATISTICAL AREAS DUE TO INDUSTRY ASSISTANCE POLICIES, 1981/82 AND 1986/87

Statistical Area	*True Subsidy Rate (%)*		*Foregone Output ($ million)*	
	1981182	*1986187*	*1981182*	*1986187*
Northland	-2.5	-1.8	33	26
Central Auckland	1.6	1.6	-180	-190
Waikato/Bay of Plenty	-1.4	-1.3	87	82
East Coast	-3.5	-3.4	22	20
Hawkes Bay	-2.0	-2.2	39	42
Taranaki	-2.3	-2.1	31	28
Wellington	1.4	1.2	-110	-86
Mailborough	-2.0	-2.1	8	9
Nelson	-2.2	-2.4	21	24
Westland	-1.8	-2.4	5	7
Canterbury	0.6	0.6	-33	-30
Otago	-0.5	-0.6	12	13
Southland	-3.7	-3.9	59	57

Notes: Monetary values are in real terms ($ 1981/82)
1986/87 protective rates are the average of 1985/86 and 1987/88 (Syntec, 1988).
Regional indu ' stry distributions from 1981 and 1986 Census of Population.
True subsidy rate = (Region, 'price' increase - 'price' increase NZ)/(1 + 'price' increase)

IMPLICATIONS

The results in Table II suggest that industry protection policies may have been an important cause of internal migration patterns. The implicit tax on provincial regions reduced their ability to compete for resources. Consequently, mobile factors of production, such as labour, moved to more favoured regionss. How important was this as a determinant of population changes?

Table III provides estimates of the job loss in the most affected regions, using 1986/7 data. These job loss estimates are based on the net effects of subsidies and protection to traded good industries after increases in the prices of home goods are accounted for. The dollar value of this tax/subsidy is more tangible than the 'foregone output' estimates of Table II. The value of the tax/subsidy is converted into a reduced/increased regional wagebill using the labour: output coefficients (at unassisted prices) from the 1986/87 Input/Output table6. This reduced/increased wagebill is converted into a job loss/gain estimate using the average wage in February 1987 (at unassisted prices). Results are provided for the five most heavily taxed regions (four of which had been 'priority regions') and for the region with the largest absolute job loss.

The size of the job loss suggests that industry protection made a quantitatively significant contribution to population declines in some provincial regions. The job loss percentages were similar to the estimates of regional tax rates -two to three percent. If protection did cause migration out of the provincial regions society will have borne two forms of the costs. The first relates to the industries suffering job losses or reduced employment growth rates; these were export industries where New Zealand has a comparative advantage. The industries receiving the displaced workers - importables and non-traded goods - were not areas where New Zealand had comparative advantages, so net output and productivity would decline 7.

The second source of social costs relates to the demand for services that new (internal) migrants place upon the metropolitan areas. The marginal cost of a new addition to the Auckland metropolitan population is much higher than the marginal cost of an additional person in a provincial town. These costs are due to traffic congestion, urban sprawl, increased demand for utilities and so forth. For the provincial town the marginal cost may even be negative, a new resident maintains the viability of schools and social services. So the movement of someone out of an estimated provincial community into an expanding metropolitan area could generate social and economic costs for both communities.

The existence of these social costs is evidenced by the use of regional development policies, which aimed to keep people in the provinces. The question then is, why did policy makers have these policies operating while industry protection policy was simultaneously operating in the opposite direction? It would be satisfying, but probably incorrect, to say that they did not realise that their policies were at cross-purposes. Although detailed estimates of sectoral and regional costs of protection were not available, intuition suggested the effects measured in this paper. Furthermore, there was an explicit regional element in the protected import-substitution-industrialisation policy. Manufacturing protection was seen as a mechanism for sharing the advantages of a favourable endowment of agricultural land across the entire population, rather than concentrating those benefits in the hands of wealthy landowners located in the provinces (Rose, 1969). The Australian tariff had been based on similar arguments in the 1930s (Anderson and Garnaut, 1987).

Whether this analysis was true or not, policy makers soon

TABLE 111
IMPLIED REGIONAL JOB LOSS DUE TO INDUSTRY PROTECTION, 1986/87

Statistical Area	*Monetary Value ($ million)*		*Job LossIGain]*
	Tax1Subsidy	Wagebill	
Northland	-129	-16.6	-893 (1.9)
East Coast	-71	-8.8	-474 (2.7)
Taranaki	-129	-16.6	-896 (2.2)
Nelson	-100	-13.3	-714(2.3)
Southland	-193	-24.7	-1330 (3.3)
Waikato/Bay of Plenty	-486	-68.4	-3683 (1.9)

1 Job loss relative to 1986 employment (076) in brackets.

became concerned about the lack of wealth and job creation in the provinces. It may be that regional development policies were seen as a salve that would alleviate some regional consequences of protected industrialisation. Similarly, the growing use of tariff compensation policies for agriculture (fertiliser and interest subsidies beginning in the mid-1960s, and direct product subsidies in the 1980s) and export incentives for non-traditional manufacturing should be seen in the same fight. Reforming import protection was considered too difficult so second best policies of alleviating the worst side-effects were attempted. The unfortunate consequence was that these compensating policies became highly visible targets for fiscal reform from 1984 onwards whereas import protection proved - and is still proving - to be difficult to reform. This sequencing of liberalisation tended to perpetuate the bias favouring the metropolitan areas.

CONCLUSIONS

Policies which aimed to assist various industries had important effects on regional economies. These were caused by an uneven spatial distribution of industries where metropolitan areas specialised in home goods and importables production and provincial areas were export oriented. New Zealand's pattern of industry assistance favoured home goods and importables producers at the expense of exportables producers. The spatial consequence was a transfer of wealth and resources-most especially labour-from the provinces into the three metropolitan areas. Paradoxically this was occurring while regional programmes were sending wealth back to the provinces -albeit in much smaller amounts. This pattern of regional costs and benefits was largely unaltered by the early phases of the 1980s liberalisation.

NOTES

1.Chiao and Scobie (1990) estimated that a ten percent tariff would increase home goods prices by only five percent. The difference between their result and Wong's is that they did not assume imports and importables to be perfect substitutes (so a ten percent tariff increased importables prices by only seven percent rather than the full ten percent). The Wong (1989) estimate is used in this paper because it is consistent with the perfect substitutability assumption used by Syntec (1988) in deriving the assistance estimates).
2. Industry data came from the Census of Manufacturing for that year. This caused a reliance on the 13 Statistical Areas rather than the later and more numerous Local Government Areas. 3. This is the weighted average of the ten percent subsidy for exportables, 28 percent tariff for importables, and 24 percent price increase for home goods.
4. A further simplifying factor is the absence of quantity adjustments in response to these price changes. Accounting for these would require detailed knowledge of the relevant elasticities. This omission understates the degree of advantages to favoured regions.
5. The other option of external migration is not considered here.
6. These estimates are only as strong as the Input-Output assumptions, namely, fixed technical relationships, constant returns to scale, plus the added assumption that these relationships would hold with the removal of industry assistance.
7. This is akin to saying that protection misallocated resources by moving them away from industries with comparative advantage.

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