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## Regions in Changing Economic Environment

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# The Web Book of Regional Science

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## Regions in Changing Economic Environment

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# 1 Introduction

If one were to describe the most general characteristic of the current global economic life, most likely it would be “change” – “change” in the broadest sense:

- Globalisation;
- Establishment of free trade zones;
- **Macro-** and **microeconomic** reforms initiated by the governments of developed countries;
- Restructuring and/or merges initiated by large companies; economic transition in the former communist world; and
- Deregulation of economies in developing countries.

Meanwhile, it is not very often that otherwise carefully designed and planned reforms take into account any regional implications.

The purpose of this module is to consider change from a regional perspective. We will be looking at two groups of changes: microeconomic restructuring and fiscal reforms. A two region /two product model is used to illustrate the theoretical concepts discussed. The objective is to determine the impact of a particular reform upon regional expenditure patterns and, therefore upon the socio-economic situation in the region.

The module consists of two parts.

In the first, *microeconomic reform and/or large company’s policy impact upon regions* are discussed.

The term “reform” means a change, initiated by the government, in ownership, governmental policy or regulation. It can be deregulation and/or privatisation of a publicly owned enterprise or de-monopolization. Alternatively, a change can be initiated by the company itself.

We are interested in the external impact of a reform upon a region. Either a decision is made by a government “external” to the region – such as at the federal or state, province or local level; or the company is large enough and is operated at the national or multinational level. We will consider an industry or a company, which is a considerable part of an economy of a particular region and does not operate as a major player in any other region. Reforms usually involve considerable technological or organisational change, which often leads to considerable industry downsizing of employment. While the loss of industry employment is a negative consequence of reform, the main benefit is an increase in efficiency from which the nation as a whole gains. The question addressed in this module is what are the implications of reform upon the region where the industry is located?

The restructuring of the electricity supply industry (ESI) in the La Trobe Valley region of Victoria, Australia is used as an example. Some theoretical and practical issues surrounding the impact of microeconomic reform upon the state as a whole and upon a region will be considered. The restructuring of the ESI in the State of Victoria is an example of de-monopolization and privatisation of a natural monopoly formerly owned by the state government. Similar analytical tools can be applied and conclusions drawn if restructuring takes place of a large private company predominantly located in a particular region.

In the second, *macroeconomic policy, fiscal federalism, and regions* are considered. Any economic policy of the federal or state government can affect different regions of the state or sub-state in different ways. This depends upon a regional economy’s structure and specialisation as compared to the structure of a national or state economy. Fiscal policies, in countries with federal and centralised governmental structures are considered from the regional perspective. Changes in the federal/state *tax mix* as well as changes in the direct/indirect *tax mix* unevenly affect different regions and can cause either an increase or decrease in regional disparities.

The two region /two product model is used to illustrate regional implications of fiscal reforms. An example of such a reform is discussed based on the current fiscal policy debate in Australia.



Each of the parts consists of a case study based on current Australian experience, followed by a simple modelling illustration.

## 2 A basic model

The following model is used to demonstrate an approach to the analysis of regional impacts from implementing economic reforms.

The model represents just two regions producing two products. Product  $X$  is the only output of region 1, and product  $Y$  is the only output of region 2. Each of the regions is represented by just one aggregate regional consumer. The aggregate consumer of each region consumes some part of the region's product. Another part of the region's product is used for exchange with the other region. As in most classical trade models, we exclude transaction costs.

Each region consists of perfectly competitive firms and there is no problem of aggregation of the firms' production functions into one industry function. Thus, the production function for each of the two regions can be represented as:

$$X = X(K_X L_X) \quad (2.1)$$

$$Y = Y(K_Y L_Y) \quad (2.2)$$

Supply of both commodities is represented as increasing functions of prices  $P_X$  and  $P_Y$ :

$$X_S = X_S(P_X) \quad (2.3)$$

$$Y_S = Y_S(P_Y) \quad (2.4)$$

The quantity demanded for the product of both sectors/regions  $X_D$  and  $Y_D$  depends upon prices for both products  $P_X$  and  $P_Y$  as well as upon the level of income of the aggregate consumer:

$$X_D = f^X(P_X, P_Y, M) \quad (2.5)$$

$$Y_D = f^Y(P_X, P_Y, M) \quad (2.6)$$

It is assumed that there is no income apart from the wages of employees  $L_X$  and  $L_Y$  in both sectors, and that the wage rates  $\omega_X$  and  $\omega_Y$  are constant:

$$M = \omega_X L_X + \omega_Y L_Y \quad (2.7)$$

The assumption about constant wage rates is not conventional in the traditional microeconomic analysis. However, it simplifies the model and also reflects the non-flexibility of wages as found in the majority of developed nations current industrial relations environment, especially in the short run.

We will be using the model for comparative static analysis. Such an analysis assists in answering the question, how changes in some exogenous variables and/or structural parameters lead to changes in output, relative prices, income distribution and welfare. We will interpret economic reforms as a change either in structural parameters, or exogenous variables, or both.

A conventional technique will be used to transform the model (2.1)-(2.7) in terms of log-derivatives representing small relative changes. If all the production, supply, demand and income functions involved in the model (2.1)-(2.7) are assumed as differentiable and homogenous, then they can be rewritten in the following form:

$$\frac{dX}{X} = E_{XK} \frac{dK_X}{K_X} + E_{XL} \frac{dL_X}{L_X}, \quad (2.8)$$

$$\frac{dY}{Y} = E_{YK} \frac{dK_Y}{K_Y} + E_{YL} \frac{dL_Y}{L_Y} \quad (2.9)$$

where  $E_{XK}, E_{XL}, E_{YK}, E_{YL} > 0$  are constant factor elasticities of outputs  $X$  and  $Y$ ;

$$\left( \frac{dX}{X} \right)_S = E_{PX} \frac{dP_X}{P_X}, \quad (2.10)$$

$$\left(\frac{dY}{Y}\right)_S = E_{PY} \frac{dP_Y}{P_Y}, \quad (2.11)$$

where  $E_{PX}, E_{PY} > 0$  are price elasticities of supply;

$$\left(\frac{dX}{X}\right)_D = E_{XX} \frac{dP_X}{P_X} + E_{XY} \frac{dP_Y}{P_Y} + E_{XM} \frac{dM}{M}, \quad (2.12)$$

$$\left(\frac{dY}{Y}\right)_D = E_{YX} \frac{dP_X}{P_X} + E_{YY} \frac{dP_Y}{P_Y} + E_{YM} \frac{dM}{M} \quad (2.13)$$

where  $E_{XX}, E_{YY} < 0$  are price elasticities of demand,  $E_{XY}, E_{YX} > 0$  are cross price elasticities of demand, and  $E_{XM}, E_{YM} > 0$  are income elasticities of demand;

$$\frac{dM}{M} = A_X \frac{dL_X}{L_X} + A_Y \frac{dL_Y}{L_Y}, \quad (2.14)$$

where  $A_X = \frac{\omega_X L_X}{M} > 0$  and  $A_Y = \frac{\omega_Y L_Y}{M} > 0$ .

This form of the model will be used for further analysis. Meanwhile, try to do the following exercises using the differential form of the model – equations (2.8) – (2.14):

1. *Modify the model to reflect an increase in internal efficiency in one of the industries/regions.*
2. The federal income tax is raised or lowered. Which equation and/or structural parameter absorbs this change in governmental policy?
3. Use the model to show the introduction of an excise tax on commodity  $X$  produced in region 1.

## 3 Microeconomic reform and/or large company's policy impact upon regions

### 3.1 Case study 1. Deregulation and privatisation of the electricity supply industry in the State of Victoria

As a result of the microeconomic reform of the electricity generation industry in Victoria, the state as a whole has started to enjoy some of the promised benefits of this measure. Meanwhile, the main power supplying area of the state - the La Trobe Valley Region - has been negatively affected. A few thousand people have been retrenched and considerable migration of population has taken place from the region to other areas of Victoria and interstate. This case is discussed as an example of the impact of microeconomic deregulation on a region. This case is then used to examine the theoretical issues and consequences involved when an industry, which forms a significant part of the local economy, is reformed.

#### 3.1.1 Background

##### *The geography, economy and population of the region of La Trobe Valley*

The La Trobe region is located 150 km to the east of Melbourne in the State of Victoria. It is administered by the Shire [In the Australian political system, shire is a local government in non-metropolitan areas, comparable with county in USA] of La Trobe. The region is rich in natural resources, characterised by fertile agricultural land, extensive natural forests and plantations, and the brown coal fields. Electricity produced in the region supplies 90% of Victoria's needs and has deposits of brown coal sufficient for about 300 years at current rates of utilisation. Other base sectors include agriculture (predominantly dairy and meat), forestry and pulp and paper.

The Shire of La Trobe has a population of almost 73,000. The population dramatically increased from the 1960s to the mid 1980s in response to major energy and construction developments. The population has decreased gradually since the mid 1980s, mainly because the major construction projects have been completed and the *industry base*, which was predominantly capital intensive, has entered the phase of steady operations. Based on recent trends, the population is not expected to grow in the future.

The La Trobe Valley has been characterised by a relatively youthful population. In the past there was a high proportion of the population in the 20-39 year age group, associated with young families and relatively high birth rates. This group of young families is mobile, increasing in numbers when job opportunities are available, and shifting away from the region in periods of decline. The recent trend indicates that the region's population is aging.

##### *Structure and performance of the electricity supply industry (ESI) prior to microeconomic reform.*

Originally, the Victorian ESI was established and recognised as a public natural monopoly known as the State Electricity Commission of Victoria (SECV). A number of reasons lead to public ownership of the ESI. Arguably, the most prevalent is the fact that the private sector was neither capable nor willing to finance the capital projects needed to successfully establish the industry. The costs associated with establishing the industry were beyond the scope of any private entity. Further, public ownership of the SECV was driven by the fact that the government saw the ESI as a mechanism through which it could pursue social and development objectives. The government could ensure that the unemployment rate in the La Trobe region was relatively low by employing thousands of people to work in the ESI. Another reason for public ownership was that having participated in two world wars, the government was not prepared to sell off an industry of vital importance; particularly if potential buyers had foreign interests.

During the early to mid 1980's the SECV was grossly overstaffed. Arguably, the greatest contributor to the large SECV workforce was the strong union base, which existed in all facets of the industry. With relatively few exceptions, those who were employed in the industry belonged to a union. It was the diversity of jobs and subsequently the number of unions, which forced the industry to often indulge in inefficient work practices. Numerous cases are cited where union involvement resulted in a single job being performed by

many employees. Hence, the underlying need for reform was not embedded in the fact that technological practices of the SECV needed improvement but, in the fact that restructuring was essential to rid it of its oversized workforce.

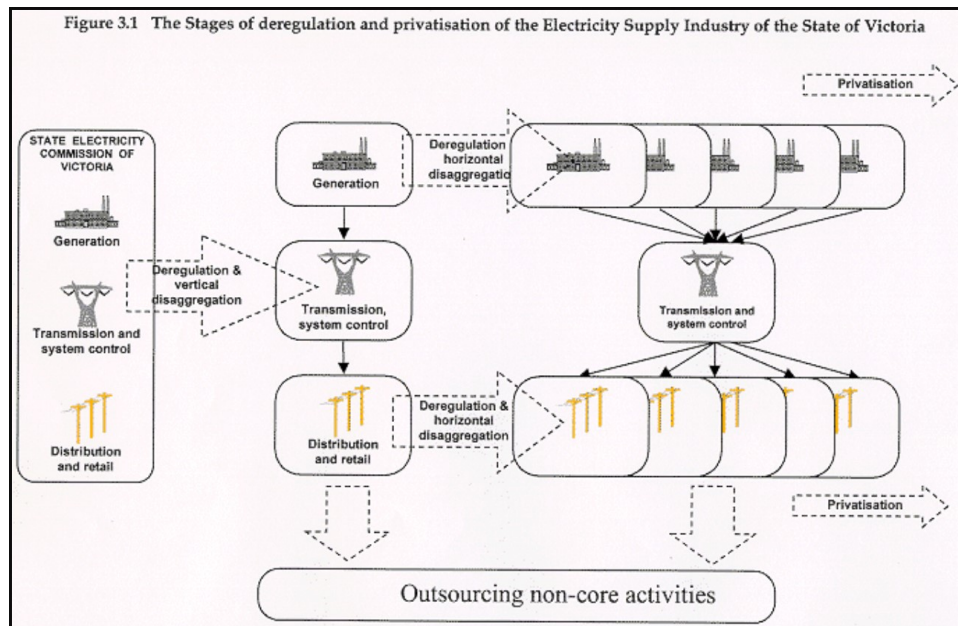
***The concept of the industry restructuring***

One the goals of a microeconomic reform of government owned public utilities is to either make statutory bodies more commercial in nature and thus more accountable, or to privatise them altogether. In any case the objectives include:

1. Efficiency improvements;
2. Better price signals;
3. Improved investment decisions;
4. Lower prices and lower state debt; and
5. Independent regulation to ensure protection of consumer interests.

Neither Australia as a whole nor the state of Victoria were pioneering in the privatisation of the ESI. The precedent for electricity privatisation, in the years preceding the reform in Victoria, had been established by a number of countries including Chile, Argentina, New Zealand and the United Kingdom.

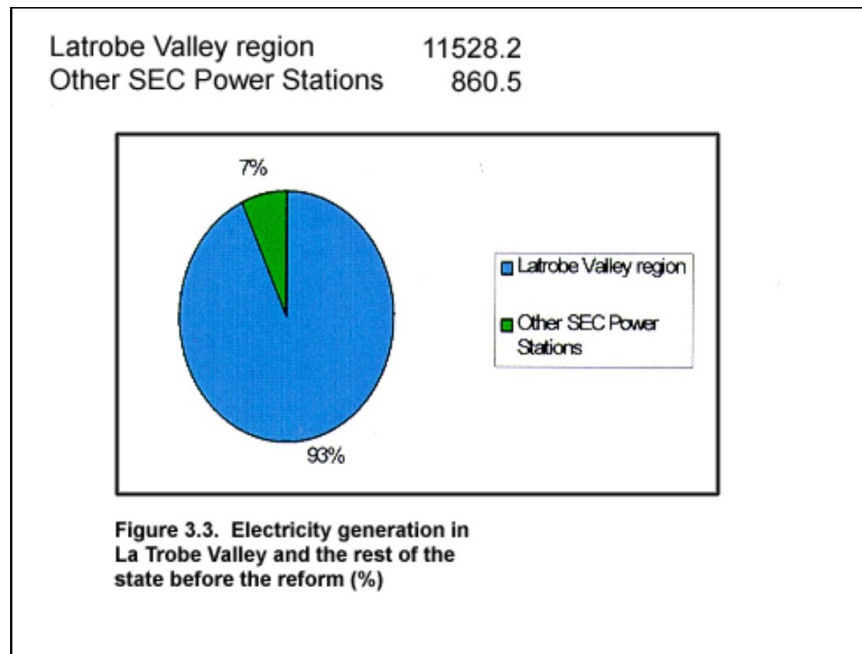
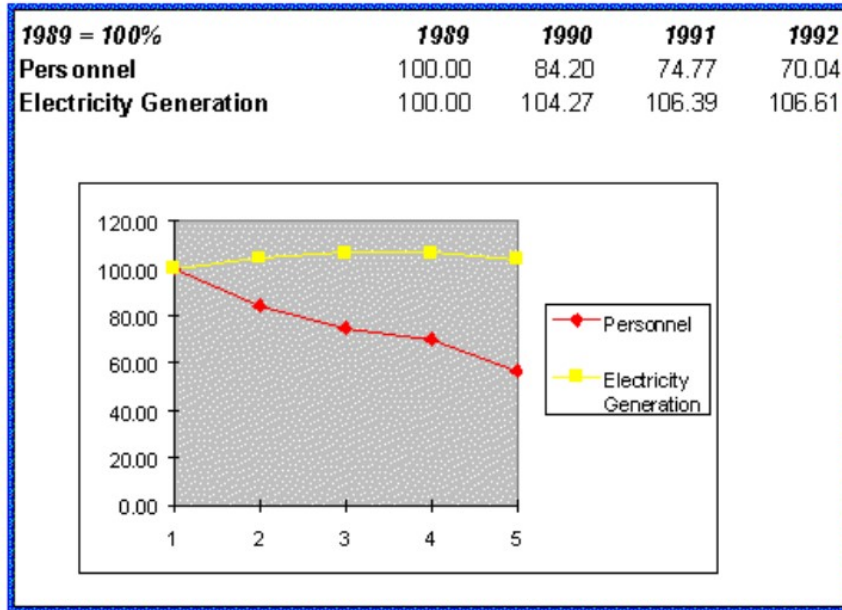
There were four stages in which the reform process took place (Figure 3.1).



The first stage of reform involved transforming the natural monopoly from a public property with statutory functions into a commercial company.

The nature of the ESI (as well as of other natural capital intensive monopolies) does not permit flexible changes in the physical amount of capital employed by the industry, either in terms of time or continuity of changes. Thus, in the short run, rationalisation of the industry did not affect the amount of physical capital. At the same time, a considerable rationalisation of job structure and reduction of employment was undertaken. The quantity of production appears to be relatively stable and not affected by the reform. (Figure 3.2). On the other hand, it can be concluded from theory that any attempt to deregulate prices at that early stage, when the industry still had a monopolistic structure, would inevitably lead to price increases. Hence the government preserved price controls until later stages of the reform. The only result stemming from the reform at the first stage, was increased internal efficiency caused by the decrease in employment. This enabled the Government to remove subsidies from the sector, previously running at a loss, and possibly make a profit. See Figure 3.3.

**Figure 3.2. Employment and electricity generation during the period of extensive reforms**



At the second stage, the single monopoly was vertically disintegrated into three new state-owned companies. The first of these companies was in charge of power generation. It was responsible for power generation and supply to the high allvoltage transmission network (“the grid”). The second was in charge of high voltage transmission. It was responsible for receiving the energy from the generators and supplying it to the distributor. The third was responsible for the retail distribution of energy. At the same time, non-core activities of the industry were to be outsourced. Consequent to the implementation of this stage of the reform, the non-core services, which were previously self-provided, were then purchased from contractors.

During the third stage of the reform, the generation and distribution enterprises were disintegrated into

commercially operating but still state-owned businesses, including several competing power generation plants and a number of regional distribution and retail monopolies. The balance sheet, cost and revenue structures for each of these new enterprises were in line with similar organisations operating in the commercial sector. Meanwhile, high voltage transmission remained a regulated natural monopoly. The generation units competed with one another for shares in the total amount of electricity supplied both to the grid and to large consumers. At the same time, large consumers had the choice of either buying energy directly from a generation unit or relying upon the more stable grid price.

The core industry was eventually disaggregated into five Business Units, including three generating units, which independently trade in the electricity supply market. The disaggregation was based upon the physical structure of the power stations and their adjoining mines.

The distribution and retail arm of the previous industry structure has been broken up into five distribution businesses, each of which services a geographic area in the State of Victoria.

The new industry structure also included the Victorian Power Exchange (VPX). The role of the VPX is to monitor and control the wholesale electricity market and to ensure that the supply system is secure. Power Net Victoria (PNV) is another body established under the new regime. PNV is a transmission company, which owns, maintains and manages the high voltage grid.

The final stage of ESI restructuring was the privatisation of the newly established Business Units.

### **Recent tendencies in the regional economy as a result of the reform**

There are two points of interest with regard to the impact of the ESI reform upon the La Trobe Valley region. Firstly, a large percentage of those people who opted to leave the reformed industry resided in the affected region. Secondly, many of those who took the “[Voluntary Departure Packages](#)” (VDP’s) did so with the belief that they would be able to find alternative employment in the region easily. With hindsight such a belief appears illogical, but we must recall that during the late 1980’s through 1991, Australia was experiencing an economic boom where the level of unemployment was relatively low. Consequently many VDP recipients left the ESI without foreseeing the financial hardships that lay ahead.

The reform impacted upon many facets of the regional economy. The most evident impact was the increase in the region’s unemployment rate. The ESI has reduced its employee numbers by over 75% since 1989 through the introduction of the VDP. In addition, the rationalisation of the region’s Local Governments and of the Australian Paper Manufacturers (APM) have also contributed to the number of regional unemployed.

Initially the economy may have experienced an increase in demand. Depending upon the number of years an employee was with the ESI, the VDP could equal anything from half-a-year to several years wages. The VDP recipients were often in a position where they could afford to pay off their mortgage or purchase luxury items. For instance, according to the focus group studies (Kazakevitch, Stone and Foster, 1997), a large number of VDP recipients bought luxury motor vehicles. In the long run, however, VDP recipients who remain in the region and are unable to find alternative employment, will be forced to reduce their consumption. The effective demand levels of households will decline across the region. The direct reduction in consumer demand was one of the first round effects of the reform. Second round effects followed as local businesses experienced a decline in sales and, in extreme cases, were forced to close down.

Meanwhile, those former SECV employees who were employed by private contractors, delivering outsourced services to the ESI, softened the economic impacts. However, local contractors employed by the ESI found themselves under threat when the generating units were sold to private organisations who’s objective was cost minimisation. When purchasing mobile services, such as equipment maintenance, the owners of the generating units were less likely to employ local contractors if employees in other regions offered the same service at a reduced rate.

The demographic aspects of the restructuring are very important to the region. The most common employee category who accepted a VDP were males aged between 25-35 years. Men who fall into this category are in the prime of their working life and are likely to find alternative employment. Due to the reduction in employment opportunities in La Trobe region, many of these men migrated with their families to other regions. The cycle of first and second round effects of the reform became clearer at this point as the reduction in the labour

force reduced demand, which in turn reduced the number of employment opportunities. Another prominent VDP employee category was men who had worked in the ESI for 31 years or more. Men in this group had almost finished their working life and were more likely to retire either within or outside the La Trobe region, living off their VDP.

A brief analysis of the above VDP groups indicates that the demographic structure of the La Trobe region underwent significant change as a result of the ESI restructuring. Younger men in the 25-35 age group left the region while older members of the community retired, often remaining within region. To the extent that the young leave, and the older recipients remain in the region, more demands are made on the resources utilised by the older generation such as health care and community services.

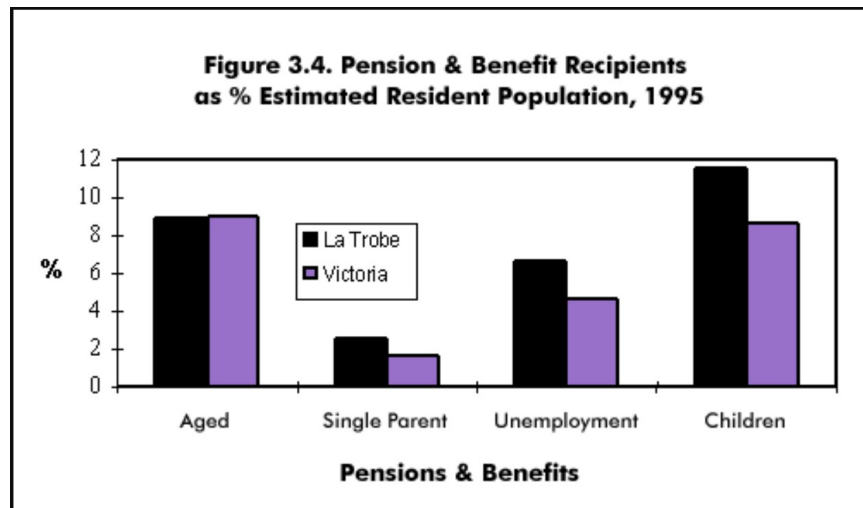
The Australian Bureau of Statistics conducted a survey across all Victorian regions from October 1990 to October 1993, and found the La Trobe region to have the highest proportion of those employed who had been retrenched or had accepted voluntary departure packages.

The decline in the La Trobe Valley's economic activity over the period from 1987 to 1995 was most evident by the steep rise in the number of recipients of pensions and benefits, as illustrated in Table 3.1, and compared with Victoria in Figure 3.4. The rise in the number of residents receiving aged pensions supports the trend toward an ageing population. In 1995, the proportion of the population receiving aged pensions was close to that of Victoria whereas in the late 1980s, the proportion was much less. The number receiving unemployment benefits increased by over 160% from 1987. This declined slightly in 1994 and 1995 as labour market policies showed some success and the Australia-wide recession eased. The continual upward trend in the number of low income families receiving the Family Allowance Supplement suggests that while some have found employment, it could be low-paid and/or part time.

**Table 3. 1: Residents of La Trobe Shire receiving Pension and Benefits, 1987-1995**

	<i>Pensions and Benefits</i>		
	<i>Aged</i>	<i>Single Parent</i>	<i>Unemployed</i>
1987	4960	1110	2014
1988	5122	1145	1872
1989	5161	1454	1678
1990	5308	1462	1909
1991	5548	1575	3237
1992	5945	1663	4045
1993	6289	1685	5346
1994	6566	1756	4980
1995	6484	1822	4819

*Source:* Department of Social Security (1988 - 1994, 1995)



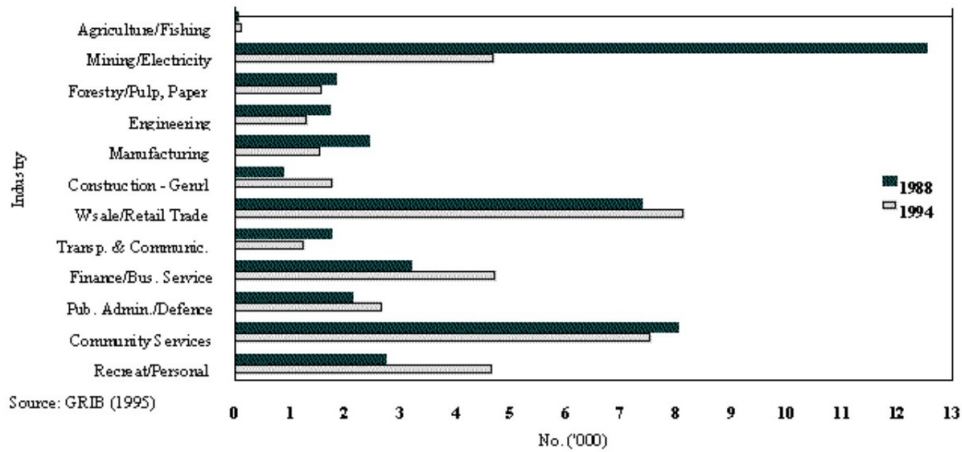
Housing prices in the La Trobe Valley have remained at a low level over the period since 1987.



Overseas migration into the La Trobe Valley (a considerable component of the population growth in Australia) has tended to be at a lower level than for Victoria and Australia, as most of the overseas population settled in the area during the boom period of the 1950s and 1960s.

The changing structure of the La Trobe Valley workforce is illustrated in Figure 3.5. The major heavy industry sectors of Mining, Electricity, Gas and Water, Engineering, Forestry, Wood Products, Pulp and Paper and Manufacturing have declined in employment while the service industries - Public Administration and Defence, Community Services and Recreation, Personal and Other Services - show increases in employment since 1986.

**Figure 3.5. Employment Trends by Industry, La Trobe Region 1988 and 1994**



### 3.1.2 *An empirical analysis of economic and social impact of industry restructuring upon the region*

An expenditure flow model. The estimation of the economic impact of the industrial restructuring should be based on a comparison between the expenditure flow generated by the industry into the regional economy both prior to and post reform. The context of the data, which can be used for such an impact analysis, and the methodology of calculation of the first round effect, are represented by the following block charts.

Figure 3.6 (with a reference to Figure 3.8) is a flow model of industry expenditure before the reform. Prior to reform, the ESI was represented by just one company - the publicly owned monopoly located in the region. The flow of expenditure from this company was used to determine the amount of injection into the regional economy by the industry prior to reform. Figure 3.6 demonstrates the flow of expenditure in three directions. Payments to employees and expenditure in the regional economy represent injections into the regional economy. The third flow of expenditure is on goods and services outside the region.

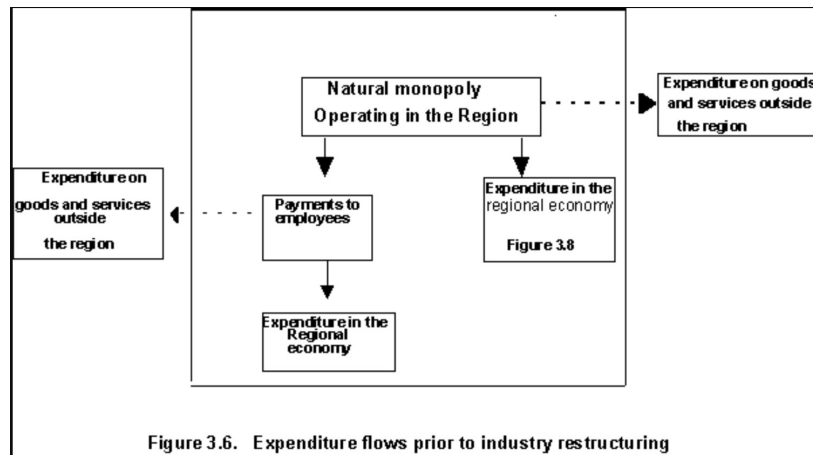


Figure 3.8

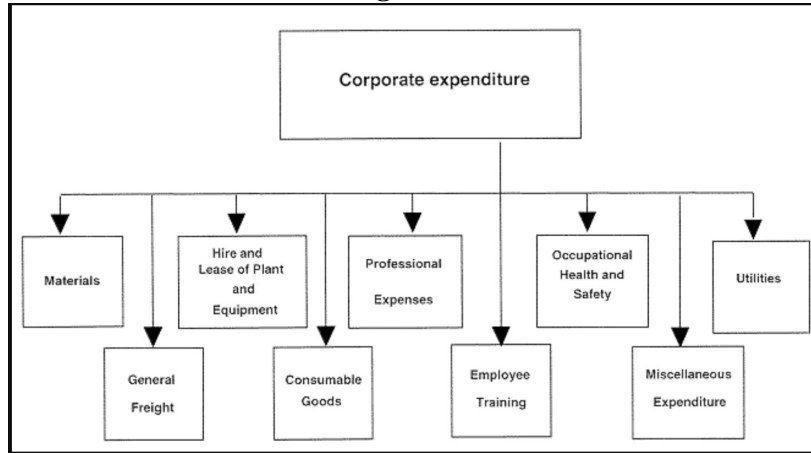
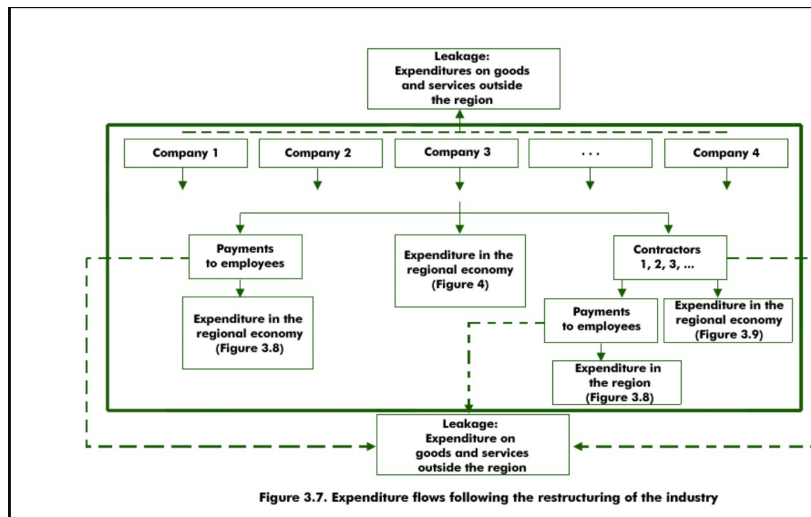


Figure 3.7 represents a flow model of expenditure into the region by the industry following microeconomic reform. A new sector of the industry included in the flow model comprises the contractors who provide services to core companies. The contractors provide those services that were outsourced from the core operations during the reform process.

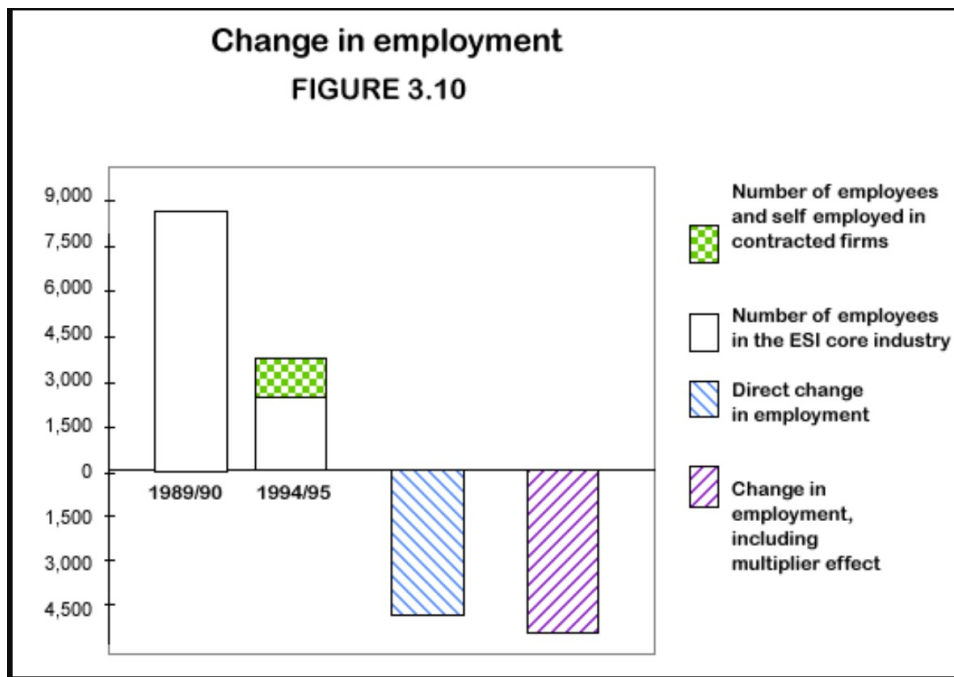
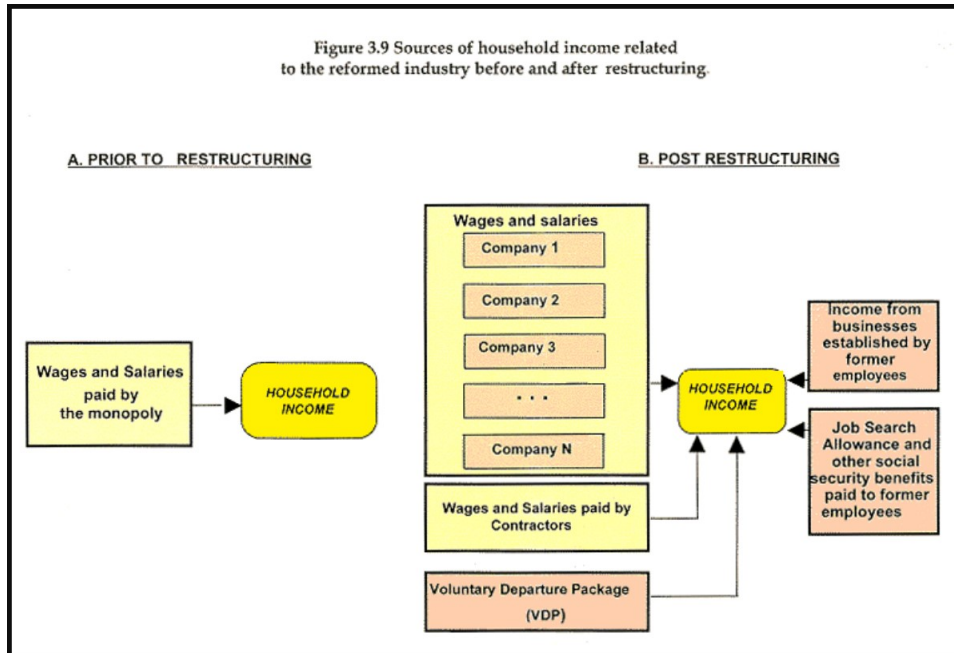


The flow of expenditure injected by newly established companies into the region is diverted either to employees or contractors, or diverted to general expenditure. Expenditure outside the region by the companies represents a leakage. The contractors' expenditure into the local economy includes salaries and wages and general expenditure. A portion of their expenditure also represents a leakage to other regions. In turn, the employees from the industry can either spend their income on goods and services produced in the regional economy or outside the region.

Figure 3.9 represents the ESI related flows of households incomes prior to and post restructuring.

Numerical data illustrate the impact of the reform on the region. The data is based on primary and secondary sources of information. Overall the results indicate that the regional economy has experienced negative economic repercussions due to the reform in the ESI.

As a result of the reforms the industry “successfully” reduced its employee numbers. Figure 3.10 illustrates the significant reduction in the ESI employee numbers between the base years - 1989/1990 prior to the beginning of the reform, and 1994/1995 post reform. The number of employees with the ESI decreased from 8,481 to 3,661. As most of these employees reside in the region this has impacted negatively upon the regional economy.

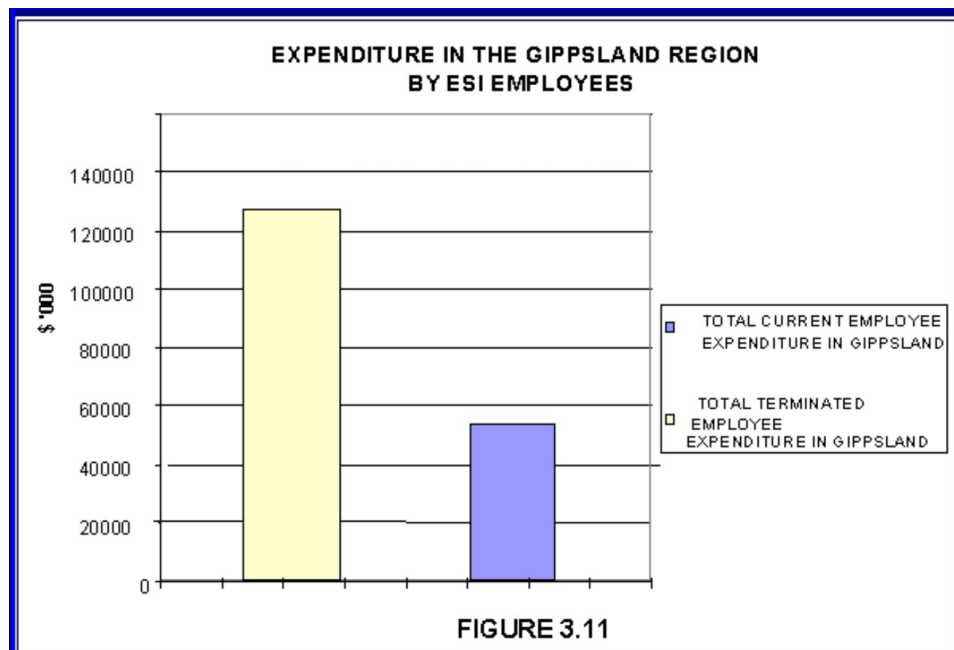


Many employees were paid a substantial sum for resigning voluntarily from the SECV and then continued to receive weekly income payments from their new employer. For those who gained employment back in the industry, the question of how they spent their package becomes an issue. For many, the package acts as a large bonus or as security for the future. If the VDP recipients who gained re-employment continued to spend the same amount of money as when they were employed with the ESI, the immediate impact of the reform would be lessened.

Overall, expenditure in the region by industry employees declined substantially, offsetting the increase in expenditure by the industry. This conclusion is seemingly logical as the reduction in employment within the industry in turn reduced the expenditure injected into the region by employees on the whole. (Figure 3.11)

The aggregate results of the study are represented in Table 3.2.

The Input-output approach is used to estimate the regional employment multiplier effect of the direct decrease in employment caused by the ESI restructuring. For this purpose, the structure of household expenditure within the region, which was obtained from an employee survey, was applied to the absolute value of the decrease in payments to the core industry's and contractor's employees spent in the region. As a result, the sector structure of the absolute decrease in demand within the region was calculated.



	1989/1990 '000	1994/1995 '000	Change	Change (% to 1989/90)
<b>Employment</b>				
Number of Employees in the ESI Core Industry	8,481	2,004	-6,477	-76.37
Number of Employees/Self-employed in Contracted Firms		1,657	1,657	
Total Impact on the Region	8,481	3,661	-4,820	-56.83
<b>Expenditure within the Region (\$ '000)</b>				
Non-salary/wages Expenditure by the ESI Core Industry	78,909	44,956	-33,953	-43.03
Non-salary/wages Expenditure by Contracted Firms		38,673	38,673	
Subtotal Expenditure Effect	78,909	83,629	4,720	5.98
Expenditure Injection in the Region by Business Unit Employees	124,051	29,569	-94,482	
Expenditure Injection in the Region by Contractors' Employees		24,448	24,448	
Subtotal Expenditure Effect	124,051	54,017	-70,034	-56.46
Employment Multiplier Effect			-367	
Total Expenditure Effect	202,960	137,646	-65,314	-32.18
Total Employment Effect			-329	

The impact of the change in regional demand upon the change in total employment was then calculated using the conventional methodology of income and employment multiplier analysis. (See, for example, Hewings, 1985).

The national input-output table of 1989/90 was used for a rough estimate of the regional employment multiplier effect of the direct decrease in employment caused by the ESI restructuring. The national input-output table of 1989/90 was used for a rough estimate of the regional employment multiplier effect of the direct decrease in employment caused by the ESI restructuring. For this purpose, the structure of household expenditure within the region, which was obtained as a result of the employee survey, was applied to the absolute value of the decrease in payments to the core industry's and contractor's employees spent in the region. As a result, the sectoral structure ( $\Delta Y_j^r$ ) of the absolute decrease in demand within the region was calculated.

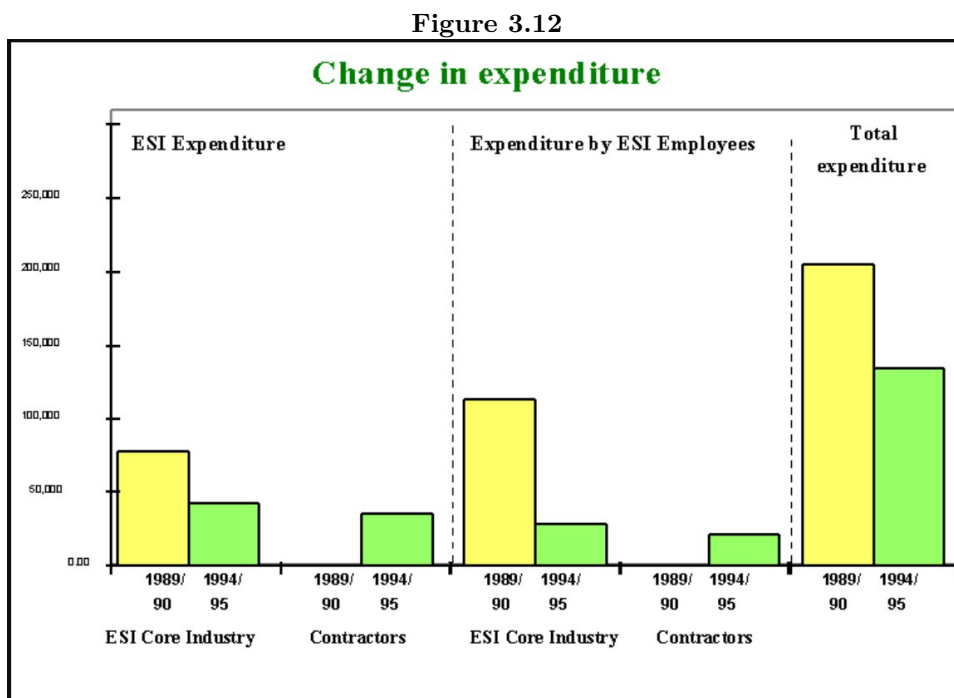
Labour productivity coefficients ( $\lambda_j$ ) were calculated based on the national data and a standard assumption made that employment in a sector  $j$  is a linear function of the gross output of the same sector ( $X_j$ ) and that zero employment corresponds to zero output:

$$L_j = \lambda_j X_j$$

The impact of the change in regional demand upon the change in total employment was then calculated as:

$$\Delta L_r = \sum_{j=1}^n \left[ \Delta Y_j^r \left( \sum_{i=1}^n \lambda_i b_{ij} \right) \right]$$

where  $B = \{b_{ij}\}_{n \times n}$  is the Leontief inverse matrix



## 3.2 An approach to theoretical analysis

### 3.2.1 The initial stage of the reform: the commercialisation of natural monopoly

To theoretically evaluate the possible impact of reform upon the region using the model from [section 2](#), consider how the reform, in terms of production functions, affects the production possibilities and factor efficiency of the reformed industry.

Let us assume that an official or private monopolist supplies a homogenous commodity or service and that managerial incentives to engage in cost reduction activities are not sufficient. This scenario is common in utility sectors if they have a monopolistic structure. For this reason, regardless of whether they are publicly or privately owned, monopolies attract the attention of reformers. This is a conventional assumption in the theories of deregulation and privatisation, as suggested in Vickers and Yarrow (1988), Bös and Peters (1986) and Bös (1986).

Following microeconomic reform, it is expected that managerial incentives are improved so that the unchanged amounts of conventional factors used in production can produce more output, or the unchanged level of output is achievable by reduced factors.

In terms of production functions, it is convenient to represent microeconomic reforms by introducing an additional “*reform factor*” ( $R$ ), which partially substitutes one or more conventional factors. In some models this factor is considered to be a normal factor of production which not only affects the level of output, but also involves a cost (Vickers and Yarrow (1988), pp 35-39).

The greater the anticipated benefits of the reform process, the greater the cost incurred during the process. However, in this model, the microeconomic reform of an industry is represented as the exogenous change of the factor  $R$  with no internal costs. This corresponds to the British and Australian experience of microeconomic reforms of public utilities when the actual costs of reforms were met by the government, not industry.

The modified production function of the industry experiencing the reform (let it be the industry producing product  $X$  in region 1) is

$$X = X(K_X, L_X, R) \quad (3.1)$$

Generally, regional models differ from national models in their assumptions concerning unemployment. In standard non-spatial general equilibrium models, the economy is assumed to be closed with regard to labour. The labour force only moves from one sector to another. In contrast, Keynesian equilibrium allows for unemployment. In inter-regional models, however, labour is able to move from one region to another.

In the differential form:

$$\frac{dX}{X} = E_{XK} \frac{dK_X}{L_X} + E_{XL} \frac{dL_X}{L_X} + E_{XR} \frac{dR}{R} \quad (3.2)$$

The analytical solution of this model with respect to the relative change in the exogenous “reform factor” is rather complicated to interpret in the general case, when all parameters are different from zero. Considering the signs of the parameters of elasticities, the relative change in  $R$  affects the welfare of both regions in opposite directions. Roughly, the reduction of costs in sector  $X$ , of region 1 reduces the price for  $X$  and, therefore increases welfare because of the increasing affordability of the product, but decreases demand for factors. Subsequently, income falls, which leads to the decrease in welfare.

The introduction of additional assumptions more realistically reflects the peculiarities of the reforms of large monopolies, comparable to that considered in [Case Study 1](#).

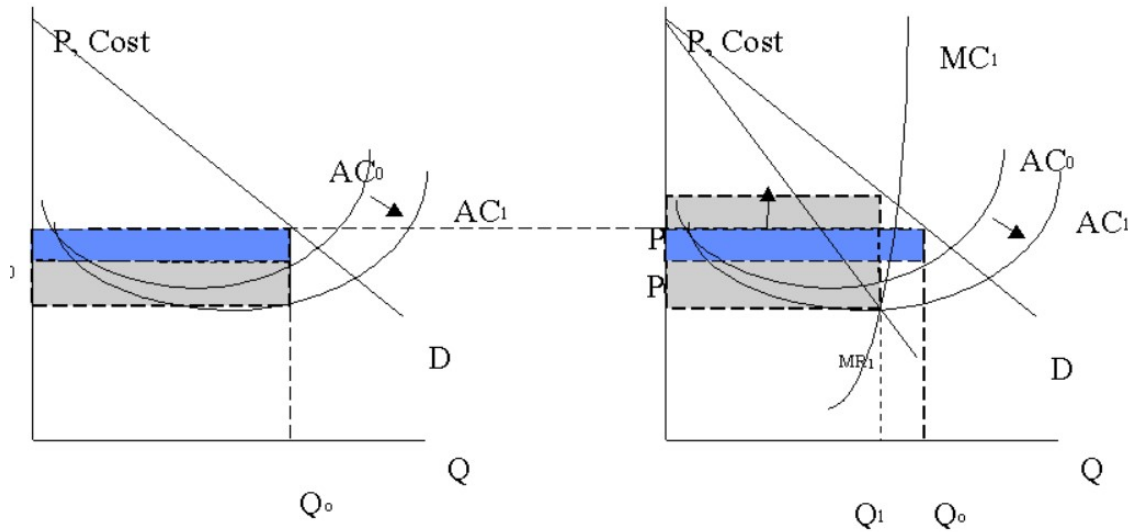
The nature of utility monopolies, which are normally large and capital intensive, does not allow small changes in the physical amount of capital employed by the industry. That is why it is easier to consider the short run-effect of the reform, which excludes changes in capital.

Also assume that either the utility produced by the reformed industry is inelastic, or that during initial stages of the reforms price is regulated by the government (this corresponds to the initial stage of the ESI restructuring in Victoria). Then the quantity of the output remains stable, compared to the considerable decrease in labour - the only factor affected by restructuring. Meanwhile, during the initial stage of the reform internal efficiency is improved. However, the structure of the industry remains close to a natural monopoly. Hence, at this stage of the reform the only likely consequence of the increase in internal efficiency is the decrease in employment. This type of reform is reflected in [Figure 3.13A](#). The only result of the reform is an increase in profit caused by savings on costs.

Further developments of the reform, if the price is deregulated and the structure of the industry remains monopolistic, are reflected in the [Figure 3.13B](#). The price would increase and quantity demanded would decrease. Profitability is expected to increase. (This is an amazing analogy to the consequences of reforms in the state owned sector in the East European economies, in which the majority of manufacturing industries have monopolistic structures).

In this model it is realistic to assume that the labour retrenched from the reformed industry is not able to find stable employment in the region. Therefore, in the ideal case, people move to the other region.

Figure 3.13 Microeconomic Reform of Natural Monopoly



A. The aim and the result of reform is an increasing incentive to improve internal efficiency. The price is still controlled by the government. As the result of the decrease in average cost (shifting from  $AC_0$  to  $AC_1$ ), the revenue is increasing, whereas the output ( $Q_0$ ) remains unchanged.

B. The aim and the result of reform is an increase in internal efficiency and the deregulation of price. The structure of the industry remains monopolistic. However, a profit maximising decision is made. The revenue of the firm is affected by increasing price (from  $P_0$  to  $P_1$ ), decreasing average cost (from  $AC_0$  to  $AC_1$ ) and decreasing output (from  $Q_0$  to  $Q_1$ ).

However, as shown in the [Case Study 1](#), there is evidence that a considerable number of those retrenched, at least in the short run, chose not to migrate. The underlying reasons for people not migrating are normally considered in the regional science literature (Armstrong and Taylor, 1993) as follows:

- The retrenched workers are specialists in their field, and there is no comparable employment elsewhere;
- High cost of migration is not affordable, especially for low income workers;
- The depressed real estate market in the region that experiences the downsize of employment created a situation where those willing to migrate are not able to sell their home, and/or are not able to obtain sufficient finance to buy a home elsewhere;
- The age of worker is a factor of their mobility; the less working life left, the less likely they are to migrate;
- Cultural reasons: people are attached to their community and to their extended family;
- People are concerned with children changing schools;
- Their marital and family status;
- Their spouse's employment opportunities elsewhere, etc.

The assumptions discussed above allow for the reduction in the number of variables and equations in the system (2.8)-(2.14) and (3.2).

The output of industry  $X$  remains unchanged. Therefore, in the short run the demand for labour in this industry decreases with the increase of the "reform factor":

$$\frac{dL_X}{L_X} = -\frac{E_{XR}}{E_{XL}} \frac{dR}{R} \quad (3.3)$$

In the short run, the production function of industry  $Y$  determines only the demand for labour:

$$\frac{dY}{Y} = E_{YL} \frac{dL_Y}{L_Y} \quad (3.4)$$

The supply function (2.11) of this industry and the function (2.14) for changes in income remain the same as in the general model.

The demand for product  $Y$  now does not depend upon changes in the price for product  $X$ :

$$\frac{dY}{Y} = E_{YY} \frac{dP_Y}{P_Y} + E_{YM} \frac{dM}{M} \quad (3.5)$$

The solution of the system (2.11), (2.14), (3.3)-(3.5), gives the following relationship between the “reform factor” and the demand for the product of industry  $Y$  in the whole economy (the only one affecting public utility):

$$\frac{dY}{Y} = - \left( \frac{A_X E_{XR} E_{YM}}{E_{XL}} \right) / \left( 1 - \frac{E_{YY}}{E_{PY}} - \frac{A_Y E_{YM}}{E_{YL}} \right) \frac{dR}{R}, \quad (3.6)$$

and the demand for the same product in the region affected by the reform:

$$\left( \frac{dY}{Y} \right)_X = - \left( \frac{A_X E_{XR} E_{YM}}{E_{XL}} \right) / \left( 1 - \frac{E_{YY}}{E_{PY}} \right) \frac{dR}{R} \quad (3.7)$$

The determination of the direction of changes in the demand for  $Y$  and, therefore, in the public utility of the whole economy is not straight forward, as the sign of the expression (3.6) depends upon the relationship between positive and negative components. However, it is clear that even the negative direction of changes in those regions of the State which are not affected by the reform, are determined only by the change in demand in the region affected by the reform. Therefore, the smaller the population residing in the area affected by the reform as a fraction of the population of the State, the lower the overall effect.

The signs of the parameters of expression (3.7) determine the expected negative relationship between the change in the “reform factor” and consumer demand in the region affected by the microeconomic reform.

$A_X, E_{XR}, E_{YM}$ , and  $E_{XL}$  are all positive. Thus the first bracket in (3.7) is positive.  $E_{PY} > 0$  and  $E_{YY} < 0$ . Thus  $E_{YY}/E_{PY} < 0$ , the second bracket is possible and the whole expression (3.7) is negative at any positive change in the reform factor  $R$ .

Therefore, the effective regional demand in the region affected by industry restructuring decreases.

### **Horizontal disintegration and privatisation**

In the latest stages of the reform, horizontal disintegration, and especially privatisation, catalyse enormous discussions among politicians, academics and the broader community about who will gain and who will lose as a result of privatisation. Those opposing privatisation appeal to the public who are accustomed to more or less stable prices and concessions provided by the government to pensioners and the unemployed. Those defending reforms claim that the state monopoly caused excess costs and that as a result of privatisation and the initiation of competition, an increase in efficiency and a decrease in costs and prices should occur.

In the view of the above considerations (equations (3.6) and (3.7), from the public interest perspective (in terms of public utility in the State as a whole and in the reforming region), even though horizontal disintegration and privatisation would not cause a further decrease in the number of jobs, only a decrease in costs and in the price for electricity would make the reforms acceptable to the broader community. The question is whether there are grounds for lower price expectations considering that the scheme of reforms has been implemented.



Deregulation should cause greater efficiency and lower costs. However, the cost minimisation goal is achieved at the earlier stages of reform, when the number of jobs in the reformed industry is reduced to a minimum.

Even though the industry is privatised, production costs cannot decrease below a certain “technologically predetermined” level. Therefore, competition does not result in pressure on the input market. The “technological” level of costs is structurally predetermined in the very expensive construction costs of the industry infrastructure. Meanwhile, basic technologies and levels of efficiency may vary in each of the production units, mainly because of their different vintage. Each was built during a different period of time and embodied corresponding contemporary (of that time) engineering solutions.

We assume that the government owned utility or independent private providers just break even. Thus, before disintegration, the cut in the wholesale price is set to cover aggregate costs of all generation plants. This kind of cross-subsidisation is not possible when all plants begin to function independently.

However, the fact that the wholesale market is still a state monopoly (as is demonstrated in [Case Study 1](#)) creates only two opportunities. Either the wholesale authority differentiates prices through individual contracts with each of the suppliers, or the price would be established, as a result of bidding, at a level satisfying all supplies. The first option would dramatically restrict the degrees of freedom for competition. The second option would establish one of the known forms of oligopolistic competition. Therefore, depending upon different factors, the price would appear at a level either higher or lower than before disaggregation, considering that the “technological” level of efficiency was achieved during the earlier stages of the reform.

Generally, due to difficulty of formal analysis and uncertainty, the price formation as a result of disintegration, is demonstrated here as the result of a numerical simulation. Consider one of the options of oligopolistic markets.

The following assumptions are being made:

- There are  $n$  production units which, after horizontal disintegration, are starting to operate independently;
- Each unit is characterised by increasing cost functions

$$c_i = c_i(q_i), c'_i(q_i) > 0 \quad (3.8)$$

- Demand for the output of the industry ( $q$ ) is variable, however, it is fluctuating within the range that requires facilities of all the production units; though, generally, they operate below their capacity:

$$q = \sum_{i=1}^n q_i; \quad q_i > 0 \quad (3.9)$$

- The cost function of the wholesale monopoly ( $c(q)$ ) is determined only by the contract price/s of the generators;
- The wholesale price is established at a level not lower than the cost

$$c(q) \leq p; \quad (3.10)$$

- The wholesale monopoly breaks even but does not function according to the profit maximisation criteria;
- The retail market is, to some extent, elastic and is characterised by a conventional decreasing function:

$$p = D(q); \quad (3.11)$$

The wholesale monopoly is aware of the conditions of the retail market and translate those conditions to the producers, through contracts, by determining price and quantity schedules.

Prior to the reform, when the industry functioned as a state authority, it was supposed to break even at a (periodically reconsidered) regulated price  $P^*$ . Otherwise, the industry might be subsidised. Thus, the average

cost of the industry is determined as one of possible combinations of the average costs of the generators (Fig.3.14A):

$$c(q) = \sum_{i=1}^n c_i(q_i)$$

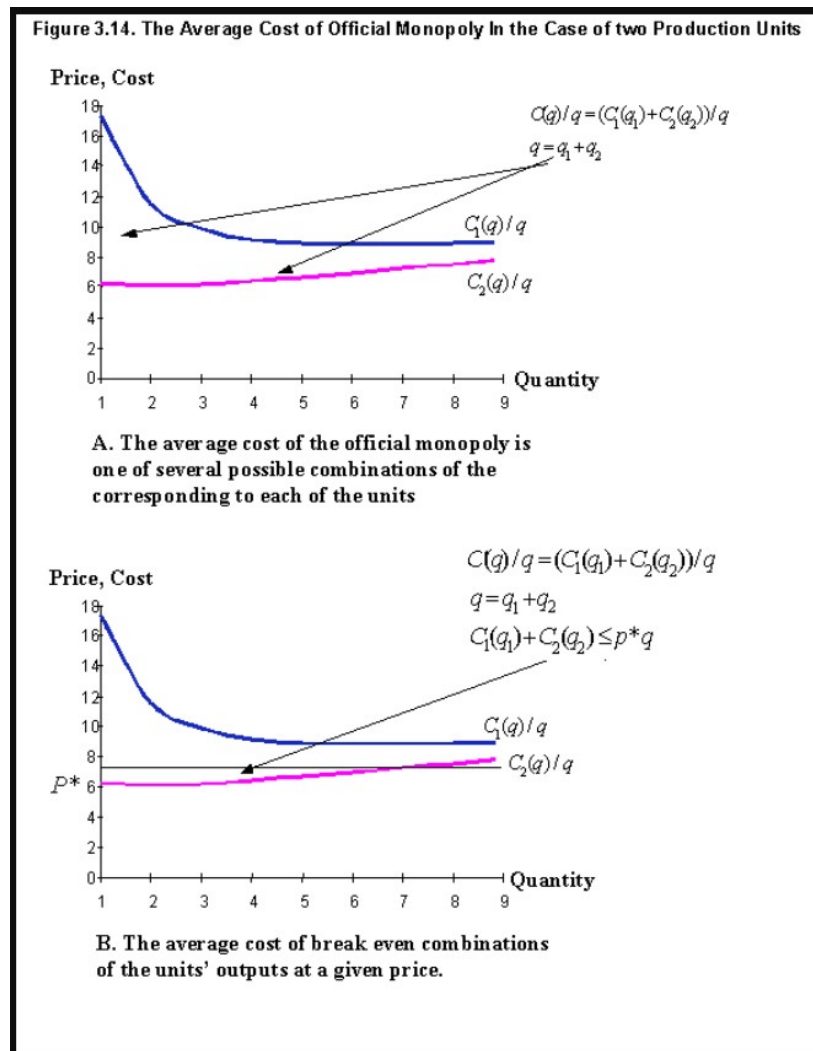
$$q = \sum_{i=1}^n q_i \tag{3.12}$$

As a result of the first stage of the reform, vertical disintegration and commercialisation of the state authority, the choice of production schedule  $q_i$  was restricted by the condition of, at least, breaking even (Fig. 3.14B):

$$\sum_{i=1}^n c_i(q_i) \leq P^* q \tag{3.13}$$

Therefore, the most inefficient production schedules, at each given price, are eliminated.

The disintegration of production units into a few independent businesses, even though not private, creates a market with oligopolistic characteristics. The consequences of this stage of the reform for price formation depend upon the market conduct of newly established firms and their interaction with the wholesale monopoly.



Considering the “official past” of the newly established oligopolistic market, it would be realistic to assume collusion as one of the possible kinds of market conduct. According to the well known concept of collusive market (Kogiku, 1971), the participants avoid rivalry and tend to maximise the total industry profit:

$$\max \pi$$

$$\pi = q \times p - c(q) \quad (3.14)$$

Combining (3.14) with (3.11) and (3.12) gives the following expression for the objective function:

$$\pi = \sum_{i=1}^n \pi_i + \left( \sum_{i=1}^n q_i \right) \times D \left( \sum_{i=1}^n q_i \right) - \sum_{i=1}^n c_i(q_i) \quad (3.15)$$

The maximisation conditions for the function (3.15) are:

$$\frac{\partial \pi}{\partial q_i} = \left( \sum_{i=1}^n q_i \right) D' + D - \frac{\partial c_i(q_i)}{\partial q_i} = 0 \quad (3.16)$$

$$i = 1, \dots, n$$

Equations (3.16) mean, that the optimal solution corresponds to the market shares  $q_i^e$  of the generation businesses at the point where their marginal costs ( $\frac{\partial c_i(q_i)}{\partial q_i}$ ) are equal to each other and to the marginal revenue of the industry ( $\left( \sum_{i=1}^n q_i \right) D' + D$ ).

The answer to the question of whether the equilibrium price  $p^e$  would be higher or lower than the price  $p^*$  before deregulation depends on several factors including:

- The parameters of the demand function;
- The level of price and production quotas before deregulation; and
- The cost functions of independent generators after deregulation.

The following numerical example illustrates possible consequences of horizontal disintegration and deregulation of price in the short run.

It is assumed that excess capacity still exists and the optimisation of factors has occurred during the previous stages of the reform. The level of production before the disintegration  $q^*$  corresponds to the point on the demand curve at a regulated price  $p^*$ . In addition, it is assumed (for purposes of more convenient diagrammatic representation), that there are two firms with different fixed but similar variable costs. The later assumption implies similarity of the industry’s marginal cost. This also means, that for the cost functions used in the example, the firms would be allowed equal quotas at any level of the industry’s output.

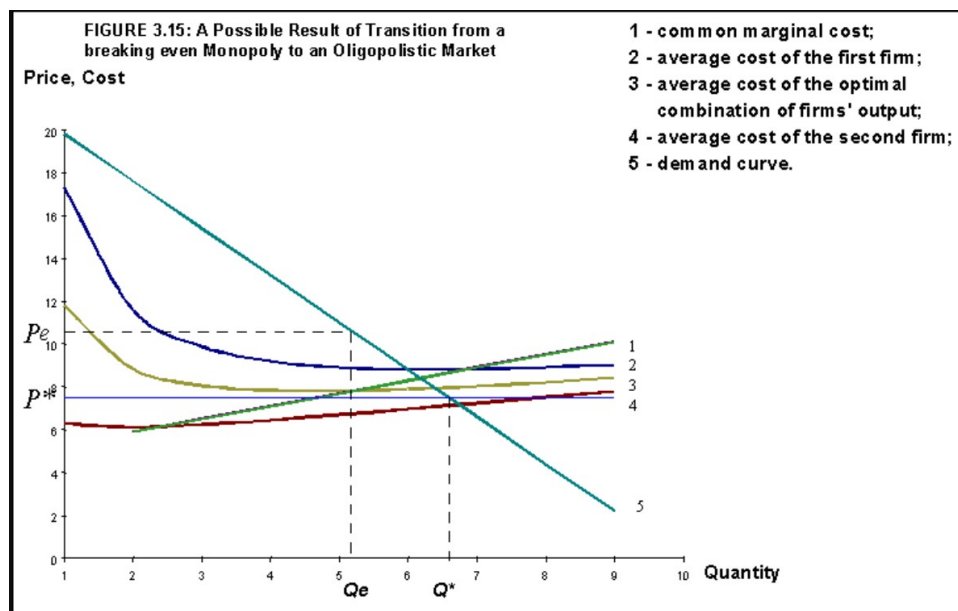
As a result of deregulation, in the sense of the condition (3.15), the profit maximising industry’s output, appears at a lower level and price at a higher level than before deregulation.

The diagram reflects a particular case, where the price before deregulation appears to be below the average cost of the oligopolistic competitive industry. As it can be seen on the diagram, the consequence of the deregulation might be similar, if the regulated price was above the industry’s average cost curve, but still between firms’ average cost curves.

The above example shows that, generally, expectations of a decrease in prices and increase in the welfare at a given cost structure are groundless. Those expectations would be reasonable only if, as the result of privatisation and emerging competition, in the long run investments in equipment cause improvement in the “technological” level of efficiency and, therefore, decrease in the costs of independent commercial firms. This is currently confirmed with the experience of the privatised production units in the La Trobe region of Victoria.

### 3.3 Conclusions

- Microeconomic restructuring imposed on an industry predominantly located in a particular region, inevitably causes shrinking of the regional economy.
- The theoretical conclusions correspond to the results of the case study conducted on the electricity industry restructuring in the Australian State of Victoria. Overall, the results of the case study indicate that the regional economy of La Trobe Valley experienced negative economic repercussions due to the micro-economic reform.
- The impact of such a reform on effective demand of the rest of the national or state economy is not that obvious. However, the smaller the regional economy, the less significant the impact on the national or state economy as a whole.
- In the case considered in this chapter, when as a result of restructuring a natural monopoly is transformed into an oligopolistic market structure, a decrease in retail price is not an automatic consequence of increased efficiency. Apart from immediate fiscal implications, positive consequences should be expected in the longer run.



### Appendix

The diagrams in [Figures 3.14](#) and [3.15](#) were plotted using the following numerical example.

$$C_1(q) = 0.3q^2 + 5q + 12$$

$$C_2(q) = 0.3q^2 + 5q + 1$$

$$C_1(q)/q = 0.3q + (1/q) + 5$$

$$C_2(q)/q = 0.3q + (1/q) + 5$$

$$P = D(q) = 22 - 2.2q$$

$Q$	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
$C_1(q)$	17.30	23.20	29.70	36.80	44.50	52.80	61.70	71.20	81.30
$C_2(q)$	6.30	12.20	18.70	25.80	33.50	41.80	50.70	60.20	70.30
$C(q)$	18.80	17.70	24.20	31.30	39.00	47.30	56.20	65.70	75.80
$C_1(q)/q$	17.30	11.60	9.90	9.20	8.90	8.80	8.81	8.90	9.03
$C_2(q)/q$	6.30	6.10	6.23	6.45	6.70	6.97	7.24	7.53	7.81
$C(q)/q$	11.80	8.85	8.07	7.83	7.80	7.88	8.03	8.21	8.42
$\Delta C(q)/\Delta q$		5.90	6.50	7.10	7.70	8.30	8.90	9.50	10.10
$P = D(q)$	19.80	17.60	15.40	13.20	11.00	8.80	6.60	4.40	2.20
$P^*$	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50

## 3.4 Bibliography

### 3.4.1 References

- Armstrong, H. and Taylor J. (1994). *Regional Economics and Policy*, Harvester Wheatsheaf.
- Bös, D. (1986). *Public Enterprise Economics*, Discussion Paper A-79. Institute of Economics, Bonn University.
- Bös D. and Peters W. (1986). *Privatisation, Efficiency and Market Structure*, North Holland,
- DEETS - Department of Employment, Education and Training. (1993 and 1995). *Small Area Labour Markets*. Canberra.
- Gippsland Research and Information Bank. (1994). “*La Trobe Region Employment and Industry Survey 1993*”, La Trobe Regional Commission, March.
- Hampton, P.(1968). “Regional Economic Development in New Zealand”, *Journal of Regional Science*, Vol. 8, No. 1.
- Department of the Treasury. (1994). “*Reforming Victoria’s Electricity Industry - A Competitive Future For Electricity*”, The Office of State Owned Enterprises, Melbourne, December.
- Kazakevitch, G., Foster, B., & Stone, S. (1997). *The Effects of Economic Restructuring on Population Movement in a Region*, Australian Government Publishing Service, Canberra.
- Kogiku, K. C. (1971). *Microeconomic Models*, Harper & Row Publishers
- La Trobe region Research and Information Bank. (1994). “*La Trobe Region Employment and Industry Survey 1993*”, La Trobe Regional Commission, March.
- Vickers, J. and Yarrow, G. (1988). *Privatisation: An Economic Analysis*, The MIT Press,.

### 3.4.2 For further reading

#### *Industry Restructuring, Deregulation and Privatisation*

- Abreu, Marcelo., & Werneck, Rogerio. (1993). “Privatization and Regulation in Brazil: The 1990-1992 Policies and Challenges Ahead”, *The Quarterly Review of Economics and Finance*, Vol. 33, Special Issue, pp. 21-41.
- Anderson, Terry., & Hill, Peter.(1983). “Privatizing The Commons: An Improvement?”, *Southern Economic Journal*, v50(2), pp. 438-450.
- Anderson, Terry., & Hill, Peter.(1986). “Privatizing The Commons: Reply”, *Southern Economic Journal*, v52(4), pp. 1165-1167.
- Bazdresch, Carlos., & Elizondo, Carlos. (1993). “Privatization: The Mexican Case”, *The Quarterly Review of Economics and Finance*, Vol. 33, Special Issue, pp. 45-66.
- Bos, Dieter. (1987). “Privatization of Public Enterprises”, *European Economic Review*, v. 31, pp. 352-360.
- Cardoso, Eliana. (1991). “Privatization Fever in Latin America”, *Challenge*, September-October .
- De Alessi, Louis. “Managerial Tenure under Private and Government Ownership in the Electric Power Industry”, *Journal of Political Economy*.
- Dreyfus, Daniel. (1989). “Deregulation of Utilities: The Natural Gas Experience”, *Business Economics*, April.
- Foreman-Peck, James., & Waterson, Michael. (1985). “The Comparative Efficiency of Public and Private Enterprise in Britain: Electricity Generation Between the World Wars”, *The Economic Journal*, v.95(Supp), pp. 83-95.
- Forsyth, Peter. (1992). “*Public Enterprises: A Success Story Of Microeconomic Reform?*”, Centre for Economic Policy Research, Australian National University, Discussion Paper No. 278, November .

- Hammond, Christopher. (1992). "Privatisation and the Efficiency of Decentralised Electricity Generation: Some Evidence from Inter-War Britain", *The Economic Journal*, No. 102, May , pp. 538-553.
- Hartley, Peter., & Trengove, Chris. (1984). "The Marginal Costs of Electricity Supply in Victoria", *The Economic Record*, December.
- Haskel, J. (1994). "*The Winners And Losers From UK Privatisation*", Department of Economics, Queen Mary and Westfield College, University of London, Paper No. 308, March.
- Helm, Dieter. (1991). "Privatisation and Environmental Regulation in the Water and Electricity Industries", *The Royal Bank of Scotland Review*, v.1991(172), pp.30-37.
- Industry Commission. (1991). "*Energy Generation and Distribution*", Australian Government Publishing Service, Canberra, 17 May.
- Jenkinson, Tim., & Mayer, Colin. (1988). "The Privatisation Process in France and the U.K.", *European Economic Review*, v. 32, pp. 482-490.
- Leontief, Wassily., Morgan, Alison., Polenske, Karen., Simpson, David., & Tower, Edward. (1965). "The Economic Impact - Industrial and Regional - of an Arms Cut ", *The Review of Economics and Statistics*, No. 3, August.
- McCarthy, Mary R. and Thomas G. McCarthy. (1989) "Irish Migration: The Search For The Efficiency And Equity Basis Of A European Regional Policy", *The Economic and Social Review*, v.21(1), pp. 71-84.
- Meller, Patricio. (1993) "A Review of Chilean Privatization Experience", *The Quarterly Review of Economics and Finance*, Vol. 33, Special Issue, pp. 95-112.
- Newbery, David. (1993). "*Restructuring and Privatising Electric Utilities in Eastern Europe*", Department of Applied Economics, University of Cambridge, Discussion Paper, November.
- Petrecolla, Alberto., Porto, Alberto., & Gerchunoff, Pablo. (1993). "Privatization in Argentina", *The Quarterly Review of Economics and Finance*, Vol. 33, Special Issue, pp. 67-93.
- Rees, Ray. (1988). "Inefficiency, Public Enterprise and Privatisation", *European Economic Review*, v. 32, pp. 422-431.
- Rodriguez, Flavia. (1992). "The Mexican Privatisation Programme: An Economic Analysis", *Social and Economic Studies*, 41:4.
- Stevenson, Rodney E. (1983) "Institutional Objectives, Structural Constraints, And Deregulation In The Electric Utility Industry", *Journal of Economic Issues*, v.17(2), pp. 443-452.
- Stevenson, Rodney. (1983). "Institutional Objectives, Structural Barriers, and Deregulation in the Electric Utility Industry", *Journal of Economic Issues*, Vol. XVII, No. 2, June.
- Tasman Institute Pty Ltd. (1991). "*Project Victoria 1991 - A Restructuring Strategy for Electricity in Victoria*", November.
- Thompson, D.J. (1987). "Privatisation In The U.K. - Deregulation and the Advantage of Incumbency", *European Economic Review*, No. 31, pp. 368-374.
- Trebing, Harry. (1986). "Apologetics of Deregulation in Energy and Telecommunications: An Institutionalist Assessment", *Journal of Economic Issues*, Vol. XX, No. 3, September.
- Troughton, Peter (1994)., "*Competition In Electricity Supply - Is It Really Good For Business*", Victorian CPA Congress, October.Melbourne.
- Walsh, Pat., & Wetzal, Kurt. (1993). "Preparing for Privatization: Corporate Strategy and Industrial Relations in New Zealand's State-owned Enterprises", *British Journal of Industrial Relations*, v.11(1), March.
- Wendling, Robert., & Ballard, Kenneth. (1980). "Projecting the Regional Economic Impacts of Energy Development", *Growth and Change*, October.

Wright, Arthur. (1979). "Energy Policy and Deregulation - Two Hot Topics, or Does Smoke Necessarily Mean There's Fire?", *Growth and Change*, January.

Yunker, James.(1975). "Economic performance of public and private enterprise: the case of U.S. electric utilities", *Journal of Economics and Business*, v28(1).

### ***Regional Impact of Industry and Industry Restructuring***

Ballis, Harry., & Munro, Lyle. (1992). "*Opting Out: A Report on the Experiences of Recipients of Voluntary Departure Packages from the State Electricity Commission of Victoria in the La Trobe Valley*", March.

Bezdek, Roger. (1975). "The 1980 Economic Impact - Regional and Occupational - of Compensated Shifts in Defense Spending", *Journal of Regional Science*, Vol. 15, No. 2.

Hampton, P.(1968). "Regional Economic Development in New Zealand", *Journal of Regional Science*, Vol. 8, No. 1.

Hobbs, Benjamin F. and Richard E. Schuler (1986). "Deregulating The Distribution Of Electricity: Price And Welfare Consequences Of Spatial Oligopoly With Uniform Delivered Prices", *Journal of Regional Science*, v.26(2), pp. 235-266.

Hobbs, Benjamin, & Schuler, Richard. (1986). "Deregulating the Distribution of Electricity: Price and Welfare Consequences of Spatial Oligopoly with Uniform Delivered Prices", *Journal of Regional Science*, Vol. 26, No. 2.

Industry Commission, (1994) *Impediments to Regional Industry Adjustment*, Report No. 35. Volume I: Report; Volume 2: Appendices.

Isaacs, Herbert. & Caffrey, John. (1971). *Regional Impact of Oakland University*, American Council on Education, Washington, D.C.

Leontief, Wassily., Morgan, Alison., Polenske, Karen., Simpson, David., & Tower, Edward. (1965). "The Economic Impact - Industrial and Regional - of an Arms Cut ", *The Review of Economics and Statistics*, No. 3, August.

Mickens, Alvin. (1977). "Regional Defence Demand And Racial Response Differences In The Net Migration Of Workers", *Quarterly Review of Economics and Business*, v17(1), pp. 65-82.

Rimmer, S. M., (1994). *Australian Labour Market & Microeconomic Reform*, La Trobe University Press.

Temple-Smith, Richard. & Elvidge, Norm. (1992). "*The Economic Impact of the University of Southern Queensland on the Toowoomba Economy*", University of Southern Queensland.

Wendling, Robert., & Ballard, Kenneth. (1980). "Projecting the Regional Economic Impacts of Energy Development", *Growth and Change*, October.



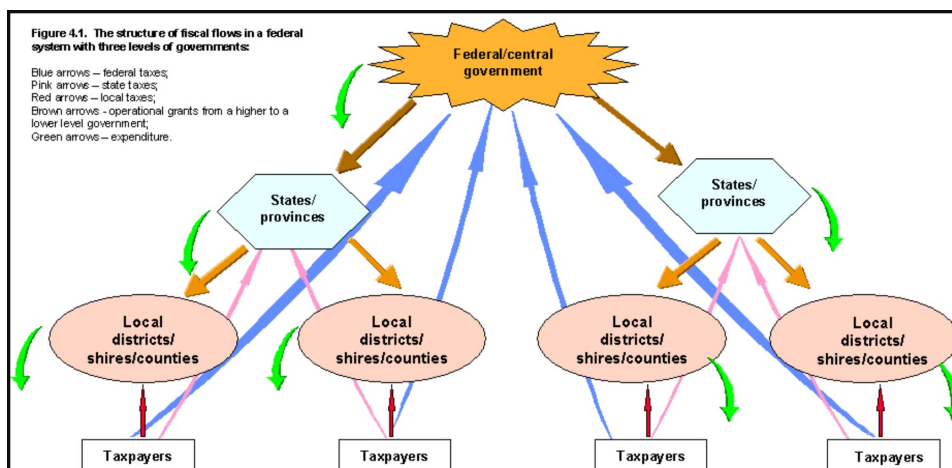
## 4 Macroeconomic policy, fiscal federalism and regions

Macroeconomic policies can be designed so that they affect regions in different ways. The goals of such a “positive” discrimination can be different too: achieving accelerated development for some of them; smoothening uneven distribution of wealth or giving an initiative for the development of an industry which has or may have a comparative advantage in a region.

The aim of this section is to consider a different kind of federal policy, not directly targeting [regional discrimination](#), however, unevenly affecting regions. In fact, as long as [regional disparities](#) take place, any macroeconomic policy is discriminative in the sense that it inevitably causes interregional redistribution of wealth. This is especially true for [fiscal policies](#) in federative countries. With regard to changes in budgetary policy, this fact was studied, from the theoretical perspective, in Quigley and Rubinfeld (1986).

By the very nature of [fiscal federalism](#), the fiscal system is designed to achieve national goals and priorities and to redistribute wealth across the country’s regions. (See Musgrave, 1969 and 1971; Musgrave, Case and Leonard, 1974).

Figure 4.1 represents the general structure of [fiscal flows](#) in a federal system with three levels of government. Both “bottom-up” flows of taxes collected by different levels of governments and “top-bottom” flows of operational grants and expenditures are indicated with arrows of different colours. A few of the real federal systems may have all or only some of the represented flows.



After taxes are collected by the federal and state governments, one or both of the following reasons may cause a redistribution of income:

- Operational grants from a higher to a lower level of government (if they are a feature of a particular country’s fiscal system) are not proportional to the amount of tax collected; or
- The expenditure flows of the government, which occur across space, are distributed to states or local regions not proportionally to “bottom-up” fiscal flows.

In this section, we consider regional consequences caused by a restructuring of the fiscal system. The currently debated reform of the federal taxation system in Australia is used as an example. Theoretical analysis is undertaken using a two region/two product model. The aim of the modelling exercise is to illustrate the imminence of the uneven impact on regions of a government budget.

### 4.1 Case Study 2. Proposed federal tax reform in Australia

#### 4.1.1 Background. The Australian taxation system

The Australian taxation system has all the features demonstrated in [Figure 4.1](#). All three levels of government collect various taxes, which form a particular component of their budgets. Meanwhile, another component of the state and local budgets is operational grants from higher to lower level governments. Unlike the USA, in

Australia the federal component of the fiscal revenue plays a considerable role in the formation of not only the federal, but also state budgets.

The Australian Taxation Office collects three major federal taxes:

- [income tax](#);
- capital gains tax; and
- [fringe benefits tax](#)

*Income tax* is based on the assessable income of Australian residents and legal entities, applicable tax rates and some allowed deductions. Regional disparities in per capita tax exist as long as there are disparities in per capita income flows.

*Capital gains tax* is paid when a capital asset is disposed at a price, which is higher than the price originally paid for the asset. The amount of the capital gains tax collected across regions differs as long as the amount of capital transactions are different.

*Fringe benefits tax* is payable by employers proportionally to non-income benefits they provide to their employees. Historically different sectors of the Australian economy have had different proportions of fringe benefits in their remuneration packages to their employees. Therefore, regional differences in the industry structure may cause relative differences in fringe benefits tax flows.

Several taxes are collected by means other than the Australian Taxation Office. The most important, in terms of tax revenue, is *sales tax*. Sales tax is a wholesale tax. The rates are set by the Federal government and are uniform across states, but different for different products. Some products such as food are not taxable. Services are not subject to this tax. Regional disparities in tax liability with regard to sales tax are also determined by different industrial structures.

#### **4.1.2 *The governmental proposal of taxation reform. Pro and contra arguments in the public debate***

After extensive debate during the recent decade, the current Liberal Coalition Government was re-elected with a comprehensive taxation reform on the agenda. The following measures were debated:

- Income tax reduction through a reduction of the marginal rates and increasing the tax free threshold;
- Eliminating the wholesale taxes;
- Elimination or reduction of several other indirect or excise taxes;
- Introduction of a capital gains tax free threshold for capital gains on small transactions;
- Shifting the fiscal responsibility for fringe benefit taxes from employers to employees; and
- Introduction of a broad [Goods and Services Tax \(GST\)](#).

The GST is supposed to be levied on each transaction in the production, distribution and supply chain (with credit being given for GST paid up the chain). Contrary to the experience of some other federative countries like the USA, it is supposed to be uniform across states. The Federal Government proposes the GST to be levied on as broad a spectrum of goods and services as possible. However, not all the transactions are technically possible to tax; and interest groups lobby different exemptions. Therefore, it is argued that some items should be excluded from the GST. Among the debated items are: food; sales of second hand goods except margin added; private sales; exports; medical services; education; international air and sea travel; childcare; charitable activities and religious services; financial services; residential rent; disposal of private residences; give-aways; etc.

The proposed reforms are supported by a rather broad community of business people and analysts. The following arguments have been put forward:

1. Such a reform has been long overdue.

2. Inflation tends to move taxpayers to higher tax margin brackets. Therefore income tax, to a greater extent, becomes a disincentive to work harder and to earn more; and income tax reduction is necessary.
3. The Australian economy is an extremely open one. Wholesale and excise taxes appear to be indirect taxation on exports, making Australian exports less competitive. For example, the existing excise tax on fuel is added to the costs of farm products and, therefore, decreases their competitiveness.
4. The proposed GST reduces opportunities for tax avoidance, as even cash income owners and quasi-legal “tax-minimisers” will be paying taxes through goods and services transactions.
5. The GST has a potential to increase the propensity to save and invest.

Arguments of the opponents are related to welfare implications in the immediate short run.

Income groups, spend different proportions of their incomes on goods and services. They also have different consumption baskets. Lower income groups earners have lower proportions of those goods subject to the abolition of the wholesale sales tax. One of the consequences of the proposed restructuring of the fiscal system will be increased prices for most goods and services as the result of the GST. Low-income groups, who are in low income tax brackets, will not gain much as the result of decrease income tax rates. Neither do they have discretionary income sufficient for increasing their savings. At the same time, they will lose relatively more from increased prices, compared to higher income groups.

The advantages and disadvantages of the proposed reform are discussed mainly in the economic and social context, but ignore regional perspectives. Regions have different structures of industries and hence the impact of the fiscal reform will be felt differently by regions, depending upon the proportion, in each region, of sectors more sensitive to reform. The same is true with regards to regional disparities in income and expenditure structures.

The regional disparities, in the context of proposed reforms, can be considered with regard to broad geographic areas (metropolitan, urban other than metropolitan and rural), states, or sub-state levels of aggregation.

In the following section, some empirical estimates are demonstrated with regard to short-run effects of the taxation reforms on household income and expenditure in broad geographic areas. A model illustration is presented of the disparities caused by regional differences in industry structure.

## 4.2 Regional impact of fiscal policy: An approach to empirical and theoretical analysis

### 4.2.1 *Some empirical estimates*

The Australian Bureau of Statistics periodically conducts comprehensive income and expenditure surveys across Australian states and [broad geographic areas](#). The survey distinguishes certain income groups, categories of households and expenditure on different groups of goods and services.

Australian regions (both states and broad geographic areas) differ with regard to total disposal income, [aggregate regional expenditure](#) and the structure of expenditure by categories of goods and services and by groups of households ([Tables 4.1](#) and [4.2](#)). Therefore, the consequences of the reforms should be expected to differ across regions. This hypothesis is demonstrated below using broad geographic area data. The following assumptions are used for the numerical experiment.

The Federal Government introduces a 10% GST (this is the rate of GST currently under consideration).

The income tax rate is reduced to return to the taxpayers the gain received as the result of the introduction of GST.

The rest of the taxes are left unchanged.

The reform is federal budget neutral.

**Table 4.1 Regional Welfare Disparities in Australia: States and Territories**

HOUSEHOLD EXPENDITURE AND CHARACTERISTICS BY STATES AND TERRITORIES

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Darwin	Canberra	Australia
AVERAGE WEEKLY HOUSEHOLD EXPENDITURE (\$)									
Broad expenditure group									
Commodity or service									
Current housing costs(selected dwelling)	95.4	83.1	81.4	70	78	62.9	116	112.29	85.38
Fuel and power	15.47	21.3	12.1	16	17	22.5	16.9	20.54	16.77
Food and non-alcoholic beverages	118.2	111	103	99	108	102	127	126.81	111
Alcoholic beverages	17.85	16.5	17.9	16	18	15.4	25.9	18.65	17.46
Tobacco	9.38	8.67	8.91	9.4	9.8	10.1	15	8.53	9.19
Clothing and footwear	35.29	37.6	28.8	29	32	29.8	24.6	44.11	33.71
Household furnishings and equipment	42.28	34.6	37.1	37	48	34.5	40.1	46.57	39.56
Household services and operation	32.82	30.5	31.9	27	32	29.7	41.6	39.47	31.58
Medical care and health expenses	28.59	26.4	25.9	28	26	24.5	24.8	28.41	27.14
Transport	94.17	93.6	95.5	84	92	76.7	93.2	127.73	93.58
Recreation	78.27	80.7	75.2	76	78	78	98.2	102.33	79.34
Personal care	11.35	11.3	11.7	11	11	9.51	10.1	14.16	11.37
Miscellaneous commodities and services	44.73	46.5	46.7	46	46	39.7	51.7	59.78	46.02
Total commodity and service expenditure	623.8	602	576	551	596	535	685	749.37	602.11
Income tax	149.4	131	128	124	126	103	168	243.71	136.99
Average weekly household income(\$)	754	712	704	681	681	620	864	1037.4	723.23
Estimated total number in population ('000)									
Households ('000)	2232	1648	1169	577	635	180	27.5	110.5	6616.8
Persons ('000)	5939	4334	3066	1416.5	1701	450	76.9	304.9	17395

**Table 4.2 Welfare Disparities in Australia: Broad Geographic Areas**

HOUSEHOLD EXPENDITURE AND CHARACTERISTICS BY BROAD GEOGRAPHICAL AREA, AUSTRALIA, 1993-94

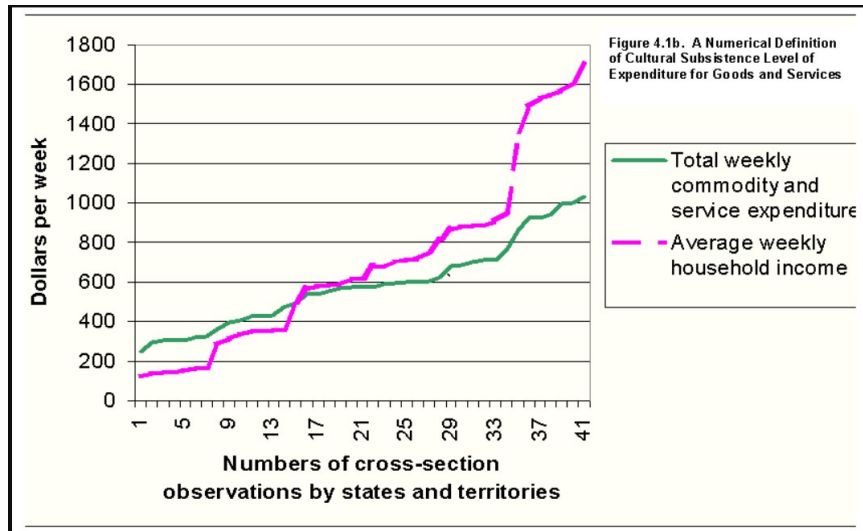
	Metropolitan	Other urban	Rural	All households
AVERAGE WEEKLY HOUSEHOLD EXPENDITURE (\$)				
Broad expenditure group				
Commodity or service				
Current housing costs (selected dwelling)	95.74	72.14	49.12	85.38
Fuel and power	17.17	15.78	16.89	16.77
Food and non-alcoholic beverages	115.83	100.63	107.28	111
Alcoholic beverages	17.09	18.4	17.35	17.46
Tobacco	9.33	8.87	9.14	9.19
Clothing and footwear	36.99	28.17	26.53	33.71
Household furnishings and equipment	40.12	39.31	36.2	39.56
Household services and operation	32.19	29.81	32.58	31.58
Medical care and health expenses	28.34	24.6	26.13	27.14
Transport	95.44	89.15	93.57	93.58
Recreation	83.94	72.82	65.21	79.34
Personal care	12.05	10.52	8.87	11.37
Miscellaneous commodities and services	49.41	39.14	42.26	46.02
Total commodity and service expenditure	633.63	549.35	531.16	602.11
Income tax				
Average weekly household income (\$)	783.09	627.41	574.45	723.23
Number of households in sample	6107	1712	570	8389
Estimated total number in households	4264.4	1787.9	564.5	6616.8

In addition, special statistics are introduced for the inter-regional comparison of income and expenditure distribution - *Cultural Subsistence Level of Expenditure for Goods and Services*. Let us define it as:

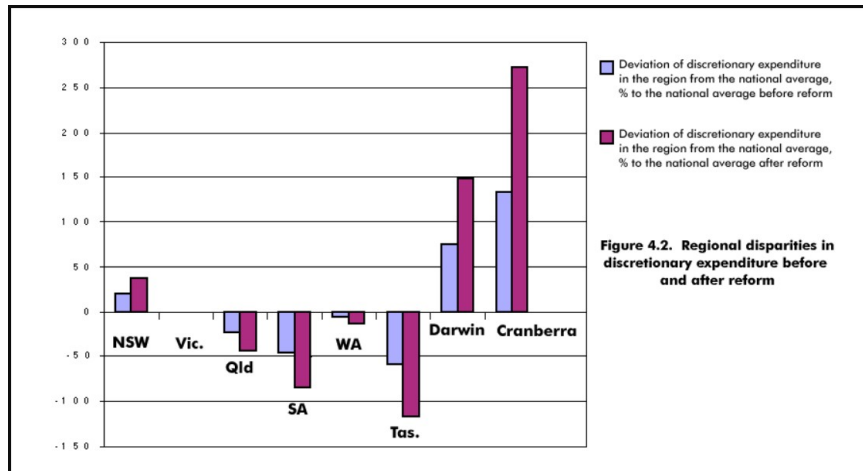
*The amount of the household's weekly expenditure for goods and services which does not exceed the household's*

disposable income per week, but does not allow any savings.

We assume that in the current economic and cultural situation of a particular country, there are no degrees of freedom in making expenditure decisions below the Cultural Subsistence Level. Looking at the cross-section data of income and expenditure sorted in ascending order (Figure 4.1), a percentage of households spend more than their income. The empirical point of intersection is \$491.20 per household per week. It is the break-even point. This point can be used as an estimate of the Cultural Subsistence Level of Expenditure for Goods and Services. Disposable income less Cultural Subsistence Level of Expenditure constitutes the level of *cultural discretionary income*, or the part of disposable income, that households can use for discretionary purposes.



The results of the numerical experiments are demonstrated in Figure 4.2. One hundred per cent is the national average discretionary expenditure for goods and services by households in real terms. The bars represent the deviation of corresponding indicators in the regions from the national average in per cent. The blue bars are those deviations before, and burgundy bars after the reform of the taxation system is introduced. The results indicate a considerable difference in discretionary expenditure across Australian regions. The differences are expected to become even greater as a result of the reform.



Therefore, in the short run regions may be affected differently by the proposed reform measures. However, such consideration does not give an answer to questions about long run consequences of additional savings, investments, and more favourable conditions for businesses.

#### 4.2.2 An approach to analysis using the two-region/two-sector model

Let us consider the variant of the reform affecting just two taxes. The income tax is reduced at a uniform rate and the goods and services tax is introduced uniformly across all regions, products, and services. The comparative impact of such a reform on each of the regions is evaluated looking at different variables. In the current Australian context of late 1990s, for example, a rather good economic climate is overshadowed by a rather high level of unemployment. Therefore, from the regional perspective, it is important to look at the impact of the taxation reform on regional levels of employment. This is considered below, using the two-region/two-sector illustrative model.

In the original model (2.1)-(2.7), no taxes were introduced, and disposable income depended only on wages. In such a context, the reduction in income tax can be interpreted as a negative income tax or an increment to disposable income. Therefore, after tax disposal income can be represented as:

$$(1+t)M = (1+t)(w_X L_X + w_Y L_Y), \quad (4.1)$$

where  $t(0 < t < 1)$  - rate of reduction in income tax;

$M$  - pre-reform disposable income;

$L_X$  and  $L_Y$  - employment in both regions; and

$w_X$  and  $w_Y$  - pre-reform after-tax wage rates in both regions.

For simplicity, let us assume zero cross-price elasticities of demand. Then the demand function for each product depends upon the price of this product and aggregate demand for this product in both regions. Introduction of a new goods and services tax alone is interpreted as an addition to the consumer price for the output of both industries/regions, which changes the demand functions in the following way:

$$X_D = f^X((1+g)P_Y, (1+t)M), \quad (4.2)$$

$$Y_D = f^Y((1+g)P_X, (1+t)M), \quad (4.3)$$

where  $g(0 < g < 1)$  is the uniform rate of GST; and other variables are defined as for the basic model in [section 2](#).

In addition, in line with the discussion of microeconomic reforms in the previous section, the short-run case is considered with the production functions dependent only on the factor labour:

$$\frac{dL_X}{L_X} = \frac{1}{E_{XL}} \frac{dX}{X}; \quad (4.4)$$

$$\frac{dL_Y}{L_Y} = \frac{1}{E_{YL}} \frac{dY}{Y}. \quad (4.5)$$

Let us consider relative changes in the demand for the product of each region as the result of changes in the taxation system. In terms of small relative changes of both income tax and GST rates, the differential form of demand functions is:

$$\left(\frac{dX}{X}\right)_D = E_{XX} \frac{dg}{1+g} + E_{XX} \frac{dP_X}{P_X} + E_{XM} \frac{dM}{M} + E_{XM} \frac{dt}{t+1}, \quad (4.6)$$

$$\left(\frac{dY}{Y}\right)_D = E_{YY} \frac{dg}{1+g} + E_{YY} \frac{dP_Y}{P_Y} + E_{YM} \frac{dM}{M} + E_{YM} \frac{dt}{t+1}, \quad (4.7)$$

On the supply side, the producers in both regions do not see the prices changed, and therefore the supply functions (2.10) and (2.11) are left unchanged, as in the original model.

Finally, according to the concept of the reform, the total additional tax collected as the result of the introduction of GST is to be returned to the taxpayer as an income tax reduction. In terms of small changes this allows us to assume that:

$$\frac{dt}{1+t} = \frac{dg}{1+g} \quad (4.8)$$

The condition of equilibrium of demand and supply, in terms of this model, can be written as the result of combining (2.10) and (2.11) with (4.6) and (4.7):

$$E_{PX} \frac{dP_X}{P_X} = E_{XX} \frac{dg}{1+g} + E_{XX} \frac{dP_X}{P_X} + E_{XM} \frac{dM}{M} + E_{XM} \frac{dt}{t+1}, \quad (4.9)$$

$$E_{PY} \frac{dP_Y}{P_Y} = E_{YY} \frac{dg}{1+g} + E_{YY} \frac{dP_Y}{P_Y} + E_{YM} \frac{dM}{M} + E_{YM} \frac{dt}{t+1} \quad (4.10)$$

The expressions for changes in prices are obtained as the result of combining the supply functions (2.10) and (2.11) with production functions (4.4) and (4.5):

$$\frac{dP_X}{P_X} = \frac{E_{XL}}{E_{PX}} \frac{dL_X}{L_X} \quad (4.11)$$

$$\frac{dP_Y}{P_Y} = \frac{E_{YL}}{E_{PY}} \frac{dL_Y}{L_Y} \quad (4.12)$$

Substitution of (4.11) and (4.12) in (4.9) and (4.10) for changes in prices  $\frac{dP_X}{P_X}$  and  $\frac{dP_Y}{P_Y}$  as well as substitution  $\frac{dt}{1+t}$  for  $\frac{dg}{1+g}$  from (4.8), after some transformations, gives the following expressions for changes in employment in each region:

$$\frac{dL_X}{L_X} = \frac{E_{PX} E_{XX} + E_{XM}}{E_{XL} E_{PX} - E_{XX}} \frac{dt}{1+t} + \frac{E_{PX} E_{XM}}{E_{XL} (E_{PX} - E_{XX})} \frac{dM}{M} \quad (4.13)$$

$$\frac{dL_Y}{L_Y} = \frac{E_{PY} E_{YY} + E_{YM}}{E_{YL} E_{PY} - E_{YY}} \frac{dt}{1+t} + \frac{E_{PY} E_{YM}}{E_{YL} (E_{PY} - E_{YY})} \frac{dM}{M} \quad (4.14)$$

Equations (4.13) - (4.14) demonstrate the dependence of regional changes in employment upon two common variables  $t$  and  $M$ .  $t$  is a macroeconomic policy variable. Change in  $t$  reflects both the governmental decision on income tax reduction, and the loss of budget revenue compensated by the introduction of (or change in) GST.  $M$  is aggregate disposable income. In real terms, it is affected by both income tax reduction, and the introduction of a GST.

Even though the relative change in employment in each of the regions depends upon these two common variables, the magnitude of the impact is different and depends upon relative regional values of the elasticity parameters. In particular, greater income elasticity of demand  $E_{XM}$  or  $E_{YM}$  causes a greater increase in employment in the corresponding region. In contrast, greater negative values of price elasticity of demand for the regional product  $E_{XX}$  or  $E_{YY}$  contribute to a movement in the opposite direction, toward a greater decrease demand and, therefore, in employment. (These are negative parameters included in both equations (4.13) and (4.14) in denominators and with the negative sign.) Also, in the short run, higher labour costs of the regional product, reflected in equations (4.13) and (4.14) by labour elasticities of output  $E_{XL}$  and  $E_{YL}$ , cause a relatively slower increase in the employment in the corresponding region. (These are positive parameters included in both equations (4.13) and (4.14) in denominators and with the positive sign.)

Therefore, generally, reforming federal fiscal policies may contribute to regional disparities, in employment and in other regional economic variables.

### 4.3 Conclusions

Using the example of the fiscal reform proposed by the Australian Federal Government, the uneven impact of such a reform on regions was demonstrated based on both empirical data and a theoretical perspective. Disparities in the outcome of the reform across regions are attributable to the following:

1. *Regional differences in the proportion of various income and expenditure groups of households.* Income and expenditure groups' contribution to the governmental budget varies both in total amount and in the amount contributed to different components of the tax mix. Therefore, any reform of the tax mix unevenly changes regional net income and expenditure patterns.
2. *Regional differences in industry mix.*
  - Changes in household income and expenditure patterns affect the industry/product composition of demand and therefore, regional employment.
  - The sensitivity of demand for different products in the regional composition of output to changes in income as well as the impact on prices is different across regions.
  - Changes in prices affect regions differently due to differences in the composition of elastic and inelastic goods in regional output.
  - Employment in the regions with a higher proportion of industries producing income-elastic products is more sensitive to the reform. The sensitivity of employment is also different due to disparities, across regions, of the labour intensive industries.



## 4.4 Bibliography

### 4.4.1 References

- Australian Bureau of Statistics. (1994). *Household Expenditure Survey, 1993-94*
- The Parliament of the Commonwealth of Australia. (1998). *A New Tax System Bill 1988*
- Musgrave, Richard A. (1969). "Theories of Fiscal Federalism," *Public Finance*, v.24(4), 521-532.
- Musgrave, Richard A. (1971). "Economics of Fiscal Federalism," *Nebraska Journal of Business and Economics*, v.10(4), 3-13.
- Musgrave, R. A., K. E. Case and H. Leonard. (1974). "The Distribution of Fiscal Burdens and Benefits," *Public Finance Quarterly*, v.2(3), 259-312.
- Quigley, John M. and Daniel L. Rubinfeld. (1986). "Budget Reform And The Theory of Fiscal Federalism," *American Economic Review*, v.76(2), 132-137.

### 4.4.2 For further reading

#### *Fiscal Federalism*

- Bell, Christopher Ross. (1988). "The Assignment of Fiscal Responsibility In A Federal State: An Empirical Assessment," *National Tax Journal*, v.41(2), 191-208.
- Buchanan, J. M. (1950). "Federalism And Fiscal Equity," *American Economic Review*, 40(4), 583-599.
- Clement, M. O. (1963). "Interstate Fiscal Equity And Federal Grants-In-Aid: An Empirical Method And Its Application, Fiscal 1952," *Southern Economic Journal*, v.29(4), 279-296.
- Gordon, Roger H. (1983). "An Optimal Taxation Approach To Fiscal Federalism," *Quarterly Journal of Economics*, v.98(4), 567-586.
- Gramlich, Edward M. and Harvey Galper. (1973). "State And Local Fiscal Behavior And Federal Grant Policy," *Brookings Papers*, v.4(1), 15-58.
- Greene, Kenneth V. "Fiscal Federalism, Spillovers, And The Export Of Taxes: A Comment," *Kyklos*, 1975, v.28(2), 412-414.
- Greene, Kenneth V. "Some Institutional Considerations In Federal-State Fiscal Relations," *Public Choice*, 1970, v.9(1), 1-18.
- Grossman, Philip J. (1990). "The Impact Of Federal And State Grants On Local Government Spending: A Test Of The Fiscal Illusion Hypothesis," *Public Finance Quarterly*, v.18(3), 313-327.
- Hayden, F. Gregory. (1973). "Fiscal Federalism: Program Budgeting And The Multilevel Governmental Setting," *Nebraska Journal of Business and Economics*, v.12(1), 23-42.
- Hettich, Walter and Stanley Winer. (1986). "Vertical Imbalance In The Fiscal Systems Of Federal States," *Canadian Journal of Economics*, v.19(4), 745-765.
- Hewitt, Daniel. "Fiscal Illusion From Grants And The Level Of State And Federal Expenditures," *National Tax Journal*, 1986 v.39(4), 471-484.
- Inman, Robert P. and Daniel L. Rubinfeld. (1992). "Fiscal Federalism In Europe: Lessons From The United States Experience," *European Economic Review*, v.36(2/3), 654-660.
- Kneebone, Ronald D. (1989). "Does Fiscal Policy Matter In A Federal Economy?," *Journal of Macroeconomics*, v.11(4), 599-608.
- Kremers, Jeroen J. M. (1989). "U.S. Federal Indebtedness And The Conduct Of Fiscal Policy," *Journal of Monetary Economics*, v.23(2), 219-238.
- Loehr, William. (1974). "Fiscal Federalism, Spillovers And The Export Of Taxes: An Extension," *Kyklos*, v.27(3), 606-609.

- Maxwell, James A. (1970). "Fiscal Equity And Federalism," *Growth and Change*, v.1(1), 39-45.
- Musgrave, R. A. (1964). "On Measuring Fiscal Performance," *Review of Economics and Statistics*, v.46(2), 213-220.
- Musgrave, Richard A. (1950). "Fiscal And Monetary Problems In A High-Level Defence Economy: A Study In Taxable Capacity," *American Economic Review*, v.40(2), 209-221.
- Musgrave, Richard A. (1954). "The Fiscal Outlook," *Journal of Business*, v.27(1), 4.
- Noam, Eli M. (1979). "Tax Limitations And Fiscal Federalism," *National Tax Journal*, v.32(2).
- Petersen, John E. (1981). "Federal Fiscal Policy And Aid To State And Local Governments: An Age Of Austerity," *National Tax Journal*, v.34(3), 383-388.
- Robinson, T. R. and T. J. Courchene. (1969). "Fiscal Federalism And Economic Stability: An Examination Of Multi-Level Public Finances In Canada," *Canadian Journal of Economics*, v.2(2), 165-189.
- Roemer, Arthur C. (1981). "The New Focus Of Federal Fiscal Policies And Implications For State And Local Governments - State Observations," *National Tax Journal*, v.34(3), 303-306.
- Rudolph, Hedwig, Eileen Appelbaum and Friederike Maier. (1990). "The Changing Face Of Fiscal Federalism," *Challenge*, v.33(6), 41-46.
- Sandler, Todd M. and Robert B. Shelton. (1972). "Fiscal Federalism, Spillovers And The Export Of Taxes," *Kyklos*, v.25(4), 736-753.
- Sandler, Todd and Robert Shelton. (1976). "Fiscal Federalism, Spillovers And The Export Of Taxes: Reply," *Kyklos*, v.29(2), 315-316.
- Shroder, Mark. (1995). "Games The States Don't Play: Welfare Benefits And The Theory Of Fiscal Federalism," *Review of Economics and Statistics*, v.77(1), 183-191.
- Srivastava, D. K. and Pawan K. Aggarwal. (1979). "Measuring Tax Revenue Centralization In Federal Fiscal Systems: A Case Study Of India," *Public Finance*, v.34(3), 414-433.
- Strauss, Robert P. and Peter B. Harkins. (1986). "The Net Fiscal Impact Of Selected Federal Block Grant Programs," *Journal of Regional Science*, v.26(1), 63-86.
- Swartz, Thomas R. and John E. Peck. (1990). "The Changing Face Of Fiscal Federalism," *Challenge*, v.33(6), 41-46.
- Teeters, Nancy H. (1972). "Outlook For Federal Fiscal Policy," *Brookings Papers*, v.3(2), 467-477.
- Tollison, Robert D. and Thomas D. Willett. (1978). "Fiscal Federalism: A Voting System Where Spillovers Taper Off Spatially," *Public Finance Quarterly*, v.6(3), 327-342.
- Wallis, John Joseph. (1991). "The Political Economy Of New Deal Fiscal Federalism," *Economic Inquiry*, v.29(3), 510-524.
- Wildasin, David E. (1987). "Federal-State-Local Fiscal Relations: A Review Of The Treasury Report," *Public Finance Quarterly*, v.15(4), 472-499.
- Regional aspects of national tax system: theory and applied modelling***
- Bahl, Roy and David Puryear. (1976). "Regional Tax Base Sharing: Possibility And Implications," *National Tax Journal*, v.29(3), 328-335.
- Beemiller, Richard M. (1989). "Local Area Fiscal Impact Analysis Using The Regional Input-Output Modeling System (RIMS II)," *Socio-Economic Planning Sciences*, v.23(5), 261-269.
- Bender, Lloyd D. and Bernal L. Green. (1968). "Implications Of Negative Tax Plans as Antipoverty Measures In Low-Income Regions," *American Journal of Agricultural Economics*, v.50(5), 1421-1425.
- Bruce, Neil. (1995). "A Fiscal Federation Analysis of Debt Policies By Sovereign Regional Governments," *Canadian Journal of Economics*, v.28(Spec), 195-206.

- Bull, Nicholas, K. Hassett and G. Metcalf. (1994). "Who Pays Broad-Based Energy Taxes? Computer Lifetime and Regional Incidence," *Energy Journal*, v.15(3), 145-164.
- Clotfelter, Charles T. and Dan Feenberg. (1990). "Is There A Regional Bias In Federal Tax Subsidy Rates For Giving?," *Public Finance*, v.45(2), 228-240.
- Danziger, Sheldon and Robert Haveman. (1977). "Tax And Welfare Simplification: An Analysis Of Distributional And Regional Impacts," *National Tax Journal*, v.30(3), 269-284.
- Fisher, Peter S. (1982). "Regional Tax Base Sharing: An Analysis And Simulation Of Alternative Approaches," *Land Economics*, v.58(4), 497-515.
- Garrison, Charles B. and John R. Kort. (1983). "Regional Impact Of Monetary And Fiscal Policy: A Comment," *Journal of Regional Science*, v.23(2), 249-262.
- Golladay, Frederick and Robert Haveman. (1976). "Regional And Distributional Effects Of A Negative Income Tax," *American Economic Review*, v.66(4), 629-641.
- Greytak, David and Richard McHugh. (1978). "The Effects Of Federal Income Taxation And Inflation On Regional Income Inequalities," *Journal of Regional Science*, v.18(1), 57-72.
- Gripaios, P. and N. Brooks. (1982). "The Determination Of Employment In Counties: Some Evidence On The Importance Of Local Authority Fiscal Policy And Government Regional Policy In England And Wales," *Applied Economics*, v.14(2), 211-218.
- Hady, Thomas F. (1969). "Tax Structure And Regional Economic Growth: A Comment," *Journal of Regional Science*, v.9(2), 325-326.
- Hamilton, Howard D. (1954). "Taxes And Taconite: Iron Ore Tax Legislation In The Lake Superior Region," *National Tax Journal*, v.7(4), 342-354.
- Haskell, Mark A. and Stephen Leshinski. (1969). "Fiscal Influences On Residential Choice: A Study Of The New York Region," *Quarterly Review of Economics and Business*, v.9(4), 47-56.
- Hutton, J. P. and K. Hartley. (1968). "A Regional Payroll Tax," *Oxford Economic Papers*, v.20(3), 418-427.
- Jones, Rich and John Whalley. (1988). "Regional Effects Of Taxes In Canada: An Applied General Equilibrium Approach," *Journal of Public Economics*, v.37(1), 1-28.
- Kramer, Randall A., Jr. and Leonard Shabman. (1993). "The Effects Of Agricultural And Tax Policy Reform On The Economic Return To Wetland Drainage In The Mississippi Delta Region," *Land Economics*, v.69(3), 249-262.
- Mathur, Vijay K. and Sheldon H. Stein. (1983). "Regional Impact Of Monetary And Fiscal Policy: A Reply," *Journal of Regional Science*, v.23(2), 263-266.
- Mathur, Vijay K. and Sheldon Stein. (1980). "Regional Impact Of Monetary And Fiscal Policy: An Investigation Into The Reduced Form Approach," *Journal of Regional Science*, v.20(3), 334-352.
- McLure, Charles E., Jr. (1980). "Administrative Considerations In The Design Of Regional Tax Incentives," *National Tax Journal*, v.33(2), 177-188.
- McLure, Charles E., Jr. (1969). "The Inter-Regional Incidence Of General Regional Taxes," *Public Finance*, v.24(3), 457-483.
- Morgan, W. Douglas and W. Elliot Brownlee. (1974). "The Impact Of State And Local Taxation On Industrial Location: A New Measure For The Great Lakes Region," *Quarterly Review of Economics and Business*, v.14(1), 67-78.
- Morgan, William, John Mutti and Mark Partridge. (1989). "A Regional General Equilibrium Model Of The United States: Tax Effects On Factor Movements And Regional Production," *Review of Economics and Statistics*, v.71(4), 626-635.
- Mutti, John, William Morgan and Mark Partridge. (1989). "The Incidence Of Regional Taxes In A General Equilibrium Framework," *Journal of Public Economics*, v.39(1), 83-108.

Rethwischk, Kurt. (1974). "Federal Tax Incentives For Regional Growth: Comment," *Southern Economic Journal*, v.41(2), 296-299.

Rinaldi, S., R. Soncini-Sessa and A. B. Whinston. (1979). "Stable Taxation Schemes In Regional Environmental Management," *Journal of Environmental Economics and Management*, v.6(1), 29-40.

Romans, Thomas and Ganti Subrahmanyam. (1979). "State And Local Taxes, Transfers, And Regional Economic Growth," *Southern Economic Journal*, v.46(2), 435-444.

Singer Neil M. (1974). "Federal Tax Incentives For Regional Growth: Reply," *Southern Economic Journal*, v.41(2), 300-302.

Singer, Neil M. (1971). "Federal Tax Incentives For Regional Growth," *Southern Economic Journal*, v.38(2), 230-237.

Steinnes, Donald N. (1984). "Business Climate, Tax Incentives, And Regional Economic Development," *Growth and Change*, v.15(2), 38-47.

Struyk, Raymond J. (1967). "An Analysis Of Tax Structure, Public Service Levels, And Regional Economic Growth," *Journal of Regional Science*, v.7(2), 175-184.

Struyk, Raymond J. (1969). Tax Structure And Regional Economic Growth: A Reply, "*Journal of Regional Science*", v.9(2), 327-328.

## Glossary

**Aggregate regional expenditure.** The total amount that all consumers, businesses, firms and government agencies spend on goods and services within a region.

**Broad geographic areas.** In the Australian statistics, metropolitan areas of the federal and state capitals including suburbs; urban areas other than metropolitan; and rural areas.

**Cultural discretionary income.** A part of disposable income that households can use for discretionary purposes.

**Cultural Subsistence Level of Expenditure for Goods and Services.** The amount of the household's weekly expenditure for goods and services which does not exceed the household's disposable income per week, but does not allow for savings.

**Deregulation.** Partial or complete removal of rules regulating an industry.

**Employment effect.** The impact of a micro- or macroeconomic policy on national or regional employment.

**Excise taxes.** Taxes levied upon goods produced for domestic consumption.

**Expenditure effect.** The impact of a micro- or macroeconomic policy on national or regional aggregate expenditure.

**Fiscal federalism.** Coordination of central and state (provincial) fiscal policies in the countries with federal governmental systems.

**Fiscal flow.** Flow of revenue to the central or regional government budget or governmental expenditure.

**Fiscal policies.** Policies targeting government budget revenue and expenditure.

**Fringe benefit tax.** Taxed payable by employers for benefits, other than wages and salaries, provided to employees.

**Goods and services tax.** An indirect tax levied on each transaction of broad spectrum of goods and services.

**Income tax.** Tax levied on assessable income of residents and legal entities, applicable tax rates and some allowed deductions. Regional disparities in per capita tax exist as long as there are disparities in per capita income flows.

**Income tax industry restructuring.** See "Microeconomic reform"

**Macroeconomic reform.** Change in macroeconomic policy directing the behaviour of firms, households and governmental bodies towards particular goals in aggregate demand, employment, balance of payment and other microeconomic variables. Can unevenly affect regions.

**Microeconomic reform.** Change in market structure and/or regulation initiated by the government in attempt to increase output at given factors by making markets work efficiently. Can unevenly affect regions with different concentration of the industry affected by the reform.

**Natural monopoly.** A monopoly that occurs when the optimal size of the firm is close to the size of the national or regional market.

**Outsourcing.** Contracting out production of an intermediate good or service by a company, which previously produced that good or service in-house.

**Privatisation.** The process of selling a public company to private owners.

**Reform factor.** In production functions, a variable representing an integrated effect of microeconomic reform on the production possibility of a firm. The reform factor can partially substitute one or more

conventional factors.

**Regional discrimination.** A macro- or microeconomic policy unevenly affecting regions; or a regional policy designed to achieve particular goals in particular regions.

**Regional disparities.** Regional differences in key economic and social characteristics such as: gross regional product, income per capita, unemployment, etc.

**Sales tax.** Indirect tax levied on goods and services.

**SECV.** State Electricity Commission of Victoria - the governmental authority that was responsible for running the state owned electricity industry in the State of Victoria, Australia prior to the reform of early 1990s.

**Voluntary departure package.** A lump sum offered by a company, downsizing its labour force, to those employees who voluntarily agree to terminate their contracts before expiration.