

**THE ECONOMIC VALUE OF THE PORT OF CAPE TOWN FOR THE
WESTERN CAPE ECONOMY**

by

ANNERINE SMITH

Assignment presented in partial fulfillment of the requirements for the degree of Master
of Philosophy (Maritime Studies)

at the

UNIVERSITY OF STELLENBOSCH



Study leader:

MR. B.C. FLOOR

DECEMBER 1999

Declaration

I, the undersigned, hereby declare that the work contained in this assignment is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Date: 22 November 1999.....

Summary

The Port of Cape Town is one of the six commercial ports in South Africa and serves a large natural hinterland which covers the entire Western Cape as well as an economic hinterland which stretches as far as Gauteng and into Southern Africa.

The purpose of this study was to illustrate the economic importance of a port such as the Port of Cape Town to the economic development and growth of a regional economy.

The Western Cape economy can be regarded as relatively stable and prosperous with the agricultural sector as one of the most important contributors to the gross regional product. The port as catalyst in international trade contributes significantly to the growth and competitiveness of sectors such as agriculture and other manufacturing industries in the region

The importance of the port community in the Port of Cape Town has also been analyzed in its contribution to the creation of employment and the multiplying effect of monies spent by that community. That multiplier effect for the port was calculated at 2,27 while the number of jobs created within the boundaries of the port is estimated at 5 305.

The Port of Cape Town being a full service port contributes a substantial amount to the region's economy through its "core" business of cargo handling. During 1997 the total value of cargo moving through the Port of Cape Town amounted to R 32,3 billion. However, that contribution is further expanded through ancillary services such as shiprepair and the accommodation of fishing fleets and cruise vessels. The Port of Cape Town as a preferred bunker port is also of significance to the port community and the region, which it serves.

The conclusion is reached that the economic impact of the activities of the port community on the various sectors in the Western Cape economy is substantial

Acknowledgements

I would like to acknowledge and thank the following persons and organisations:

Mr. B.C. Floor, my study leader, for assistance and guidance.

The National Department of transport for financial assistance.

Dr. H.C. van Niekerk for tuition and support.

Mr. R. Kingwill, General Manager Western Ports, Portnet for permission to use the Port of Cape Town as case study.

Portnet, Marketing for information and support.

Duncan Dock Cold Store, International Harbour Services, Cross Berth Cold Store, Beiramar Shipping Services, Globe Engineering, Cape Town Bulk Storage and Joint Bunkering Services for information and co-operation with research.

My parents and friends for their interest and encouragement.

Above all, glory to God, without His grace this would not be possible.

Contents

Chapter 1 : Introduction

1.1 The characteristics and functions of a port and its economic relevance	1
1.2 The economic importance of a port for its hinterland	2
1.3 Motivation for study	4
1.4 Methodology	6
1.5 Lay-out of the study	6

Chapter 2 : The Western Cape economy

2.1 Introduction	9
2.2 Theoretical background on the analysis of regional economies	9
2.3 Overview of the Western Cape economy	11
2.4 The importance of the Western Cape economy in comparison with the rest of South Africa	15
2.5 Infrastructure	17
2.6 Sector allocation	17
2.7 Closing remarks	20

Chapter 3: The development of the Port of Cape Town

3.1 Historical development	22
3.2 Port development	24
3.3 Infrastructure and port services	27
3.4 Statistics : port activity	29
3.5 Port community	30
3.6 Description of hinterland	36
3.7 Closing remarks	41

Opsomming

Kaapstadhawe is een van die ses kommersiële hawens in Suid Afrika. Die hawe bedien 'n groot natuurlike hinterland wat oor die hele Wes-Kaap strek, asook 'n ekonomiese hinterland sover as Gauteng en Suidelike Afrika.

Die doel van hierdie studie is om die ekonomiese belangrikheid van 'n hawe, soos Kaapstadhawe, vir die groei en ontwikkeling van die streekseksonomie aan te toon.

Die ekonomie van die Wes-Kaap kan as relatief stabiel en welvarend beskou word. Die landbou sektor is een van die belangrikste bydraende sektore tot die bruto nasionale produk van die streek. Binne hierdie streekseksonomie speel die hawe 'n belangrike rol as katalisator in internasionale handel. Dit dra ook betekenisvol by tot die internasionale mededingendheid van ander sektore binne die streek waaronder die landbou en vervaardigingsektore van die belangrikste is.

Die belangrikheid van gemeenskap binne die Kaapse hawe is verder ontleed. Die ontleding is gedoen aan die hand van die bydrae tot werkskepping asook die vermenigvuldiger effek van inkomstes wat deur hierdie hawe gemeenskap spandeer word. 'n Vermenigvuldiger effek van 2,27 is bereken terwyl die aantal werksgeleenthede binne die hawe op 5 305 beraam word.

As 'n sogenaamde voldiens hawe dra Kaapstadhawe 'n substansiële bydrae by tot die streekseksonomie deur middel van die kern besigheid, naamlik vraghantering. In 1997 het vrag met 'n gesamentlike waarde van R 32,3 miljard oor die kaaie van die hawe beweeg. Hierdie bydrae word egter verder vergroot deur bykomende dienste soos skeepsherstel en die akkommodasie van vissers vlote en passasierskepe. Kaapstadhawe as voorkeur bunker hawe is ook van groot belang vir die streek.

Ten slotte word die gevolgtrekking gemaak dat die ekonomiese impak van hawe aktiwiteite op die onderskeie ekonomiese sektore van 'n streek betekenisvol is.

Chapter 4: The multiplier effect

4.1 Definition	44
4.2 Theoretical background	44
4.3 Criticism of the theory of multipliers	48
4.4 Calculation of the multiplier effect in the Port of Cape Town	50
4.4.1 Assumption	50
4.4.2 Calculation	51
4.5 Closing remarks	53

Chapter 5 : Employment associated with the Port of Cape Town

5.1 Introduction	54
5.2 Employment categories in the Port of Cape Town	54
5.3 Closing remarks	56

Chapter 6 : Cargo handling in the Port of Cape Town

6.1. Introduction	57
6.2 Types of cargo	58
6.3 Statistics : Port activity	59
6.4 Value of cargo	60
6.5 Revenue earned by the port community through the handling of cargo	60
6.6 Closing remarks	63

Chapter 7: Port related industries

7.1 Introduction	64
7.2 The bunker industry	64
7.3 Ship repair industry	66
7.4 Fishing industry	68
7.5 Cruise tourism	70
7.6 Closing remarks	72

Chapter 8 : Conclusion 73**Bibliography** 75**Annexure A: List of Respondents****Annexure B: Calculation of multiplier with Portnet profits
included****Annexure C: Cargo handling revenue****Annexure D: Bunker value****Annexure E: Revenue earned by tour operators****Annexure F: Calculation of the value of the clearing &
forwarding business**

List of figures

2.1 Contribution to GDP – 1995

3.1 Lay-out of the Port

3.2 Imports: Natural hinterland

3.3 Exports: Natural hinterland

List of tables

- 1.1 Possible benefits of port investment
- 2.1 Gross Domestic Product
- 2.2 Exports from the Western Cape region – Rand value
- 2.3 Comparative statistics for provinces
- 2.4 Socio-economic indicators
- 2.5 Economic sectors in the Western Cape (1998 estimate)
- 2.6 Western Cape growth and investment sectors
- 3.1 Total tonnage handled
- 3.2 TEU's handled
- 3.3 Vessel arrivals
- 3.4 Gross register tonnage of vessels calling
- 3.5 Major imports through the Port of Cape Town as illustrated in the natural hinterland
(excluding petroleum products)
- 3.6 Major exports through the Port of Cape Town as illustrated in the natural hinterland
(excluding petroleum products)
- 5.1 Employment categories for analysis of port related employment
- 6.1 Total tonnage handled
- 6.2 TEU's handled
- 6.3 The value of cargo imported and exported through the Port of Cape Town
- 6.4 Cargo handling revenue earned by Portnet
- 6.5 Revenue for the accommodation of cargo vessels
- 6.6 Revenue earned by privately owned terminals in the port
- 6.7 Revenue earned by stevedores
- 6.8 Revenue earned by ships' agents
- 6.9 Revenue generated through the handling of cargo
- 7.1 Bunker only calls: Port of Cape Town
- 7.2 Bunkers provided in the Port of Cape Town
- 7.3 Ship repair activity in the Port of Cape Town
- 7.4 Calculation of weighted average days in port

- 7.5 Contribution of the shiprepair industry to the economy**
- 7.6 South African fishing vessels calling at the Port of Cape Town**
- 7.7 Foreign fishing vessels calling at the Port of Cape Town**
- 7.8 Contribution of the foreign fishing fleets to the Port of Cape Town**
- 7.9 Cruise vessel activity in the Port of Cape Town**
- 7.10 Contribution of the cruise tourism industry to the economy**
- 8.1 Summary of the impact of the activities in the Port of Cape Town on the creation of employment and the circulation of income in the Western Cape**

Chapter 1

1. Introduction

1.1 The characteristics and functions of a port and its economic relevance

Kipling, a famous novel writer, once said, “*transport is civilization*”. This may be a strong statement, but if the evolution of the world economy and the globalisation which has taken place over the last decade is considered, one can only but agree. It can even be re-written as trans-**port** is civilization.

If it were not for ports linking economies to each other through shipping, how would industrial nations have developed?

Often ports are referred to as gateways between land and water, used by ships on the one side and land transport modes on the other. However, a port is of more importance than being just a gateway to international trade. It must afford a safe haven for ships where they can not only anchor or berth for loading and unloading cargo, but be repaired, refueled and stocked with the necessary provisions.

Furthermore, a port has to fulfill the role of a warehousing area. In many instances, goods are not merely stored at ports but are also processed in numerous ways. The service of holding large consignments of imported cargo in warehouses within the port, and breaking these up for distribution as smaller parcels of goods is an important function. That function adds substantial economic value to the goods. Exporters may sometimes also require the reverse logistical arrangement.

The provision of adequate storage and warehousing facilities is therefore an important function of a port which must always be taken into account.

1.2 The economic importance of a port for its hinterland

To substantiate the importance of transport as a catalyst for economic growth, Winkelmanns (1991) is of the opinion that many correlations between the level of regional development (e.g. regional product per capita) and other transport indicators (e.g. kilometres of railway per inhabitant) exist. Owen (1964) also calculated several freight and passenger mobility indices, which indicates the relationship between welfare and transport.

Winkelmanns (1991) goes so far, as to say that the value added by transport exceeds the value added by related production activities. That may be shown, for example, if the value of the surplus production of coal in SA is compared to its value in Japan.

The impact of a port on the economic development and survival of a region becomes apparent if it is seen as a crucial interface between the land and sea legs of industrial and commercial activities.

If the total economic impact of a port is to be evaluated, it is important that all activities taking place within the boundaries of the port are considered. Those include not only pilotage, towage, mooring and cargo handling, but also activities which may arise from those activities, such as storage, processing, banking, insurance, and so forth. The revenue generated by the supply of those services as a result of port activity comes to a substantial amount, which is repeatedly spent throughout the economy.

To analyse that effect, it is necessary to distinguish between primary and secondary impacts:

The primary or direct impact of the port leads to the establishment of industries in the following categories:

a) Necessary industries

These comprise industries indispensable for the movement of goods by sea and may include shipping lines, stevedores and terminal operators.

b) Stimulated industries

These industries include those which can extend their market by means of foreign trade through the port. The port usually plays an important role in reducing their transport costs, although they may be situated some distance from the port.

Within the Western Cape, the export fruit industry is an example of an industry stimulated by the existence of the Port of Cape Town.

c) Attracted industries

These industries locate in the region with the specific purpose of making use of the port for import/exports

In the Western Cape, examples include the textile industry and some fruit processors.

Secondary impact entails activities in the region which are economically dependent on the activities of industries within the primary group. The effects are summarised in the following categories:

a) Indirect impact

This category includes those regional activities which are dependent on the primary activities for reasons of technical relationships, for example, ship chandelling and communication provision.

b) Induced impact

This category includes regional activities which are dependent on the primary activities through consumer relationships. They include those activities which depend upon the salaries of persons directly or indirectly employed in the port.

One method of estimating the contribution of the activities stemming from the operation of a port to the regional economy is to calculate the multiplier effect of the spending directly and indirectly attributable to the existence of the port.

Input-output studies conducted in the USA have shown that “in addition, commercial port activities in 1988 generated: 1,2 million jobs; a 50 billion dollar contribution to the Gross National Product; personal income of 28 billion dollars; Federal taxes of 10 billion dollars and state local taxes of 3,5 billion dollars.” (Winkelmans (1991))

Table 1.1 on page 8 lists possible benefits of port investments to the economy of the region it serves.

1.3 Motivation for Study

Given that 95% by mass of South Africa’s international trade moves by means of sea transport, the importance of the ports of South Africa, and in this case study particularly the Port of Cape Town, cannot be overstated. During 1997, the Port of Cape Town handled ±R32 billion worth of cargo over its quays. This means that cargo with the value of 43% of the Western Cape’s GRP is handled at one or other stage through the port.

The purpose of this study is to quantify that importance in economic terms.

The Western Cape's relatively "open" economy and current trends in globalisation are probably the most important determinants of the future development of the region. Not only will tourism and agricultural export industries, which are of major importance to the region, be confronted with increasing competition, but virtually all the other economic sectors will also need to raise their efficiency. The role of an efficient and well-developed port in this challenging environment is evident.

However, there is a lack of appreciation of the important role which the Port of Cape Town is playing in addressing this challenge. The consequence of ignorance of this fact can be seen on various levels.

Firstly, the city of Cape Town is experiencing a boom period and recent developments in and around the port have placed pressure on the port authority to maintain the initiative in long term planning. The increase in trade and the boom in tourism have challenged the region to establish development solutions to cope with the growth in the Western Cape economy.

Secondly, it is becoming increasingly important for South Africa's economic survival to attract foreign investment. The port as a major investment opportunity and its potential to stimulate economic growth and prosperity of the nation is often ignored.

Thirdly, there is a lack of knowledge among the general public of the importance and role which ports play. That lack leads to apathy towards the maritime environment. Hence, students are not aware of career opportunities in the maritime field, which results in a shortage of skills within the workforce to maintain an effective and developing maritime community.

Lastly, Transnet, as port owner should acknowledge the importance of the ports as an economic catalyst and not continue to regard the ports as cash generators.

Without giving the proper consideration to their facilitating role in the economy, development will continue to fall behind that of competitive overseas ports and those in the developing neighbouring countries of Namibia and Mozambique. The result of this may be more far-reaching than is usually believed.

1.4 Methodology

A quantitative research approach has been followed in this study.

The methodology has entailed a study of academic literature on the topic as well as publications by Wesgro and Portnet. Questionnaires were used to gather quantitative information. (Annexure A is a list of respondents)

Other information has been gathered by means of telephonic interviews during which specific questions regarding employment and the industries discussed in Chapter 7 were asked.

1.5 Lay-out of the study

Having outlined the importance and background of this study, an outline of the chapters follows:

Chapter 2 affords an overview of the analysis of regional economies and explains the structure, trends and development of the Western Cape economy.

Chapter 3 outlines the development and activities of the Port of Cape Town and its potential impact on the regional economy.

Chapter 4 defines and explains the concept of the multiplier effect and applies the theory to the Port of Cape Town.

Chapter 5 deals with the creation of employment within the boundaries of the Port of Cape Town.

Chapter 6 describes and analyses the impact and economic benefit of cargo handling as the “core” business of the Port of Cape Town.

Chapter 7 deals with the contribution made by the port-related industries of bunkering, shiprepair, and the fishing industry and cruise tourism to the Western Cape economy.

Chapter 8 concludes by adding the value of all the port’s activities to the Western Cape economy

Table 1.1 Possible benefits of port investment

Direct benefit to the port	Benefits to port users	Indirect benefits to suppliers of input factors
1. additional revenue from dues on ships	1. savings in inland transport cost	1. increase in income to port related labour
2. increase in net cargo-handling revenue	2. savings in cargo-handling cost	2. increase in income to port-related industries
3. additional rental from land made possible by the project investment.	3. savings in insurance cost 4. savings in the interest expense of capital tied up in inventory 5. savings in ships' cost in port 6. savings in ships' operating cost arising from economy of scale of operating larger ships made possible by port investment 7. increase in output of port-user industry made possible by port investment	3. increase in benefits through a multiplier effect, if any.

Source: Appraisal of Port Investments, Report by the UNCTAD Secretariat, United Nations 1997, p10

Chapter 2

2. The Western Cape Economy

2.1 Introduction

In assessing the economic impact of the Port of Cape Town on the economy of the region, its structural composition and trends in development need to be explained.

Firstly, a theoretical overview of regional economies is given. Secondly, the structure of the Western Cape economy and its relationship with the Port of Cape Town are discussed and, finally, the major trends and development within the region and their possible impact on the development and operation of the port are considered.

2.2 Theoretical background on the analysis of regional economies

When analysing the regional economy of the Western Cape it may be useful to apply one or other theory in order to value the economic importance of the region. A number of regional economic theories and analytical techniques have been developed for that purpose.

Viljoen (1977) describes the following theories:

Export basis theory

This theory is based on the principle that economic development is determined by exogenous factors, and in particular the external demand for commodities in which the region has a comparative advantage. Emphasis is placed on the export activities of the region. North (1961,p.1) summarises the idea in the following words: " The timing and pace of an economy's development have been determined



by: (1) the success of its export sectors, and (2) the characteristics of the export industry and the disposition of the income received from the export sector.”

Export activities are seen as the economic foundation of the region. They generate revenue, which leads to the increased internal demand for goods and services via the multiplier effect. Therefore, it can be said that exports lead to, and are constitutive of the general economic development of the region.

The trend in the development of export potential has an impact on other non-export-based activities and structural development. Employment patterns are affected.

The Western Cape’s agricultural sector as well as its tourism industry has significant export potential, which must be enhanced to ensure economic development and growth.

Growth-point theory

Richardson (1973) describes this theory as follows: “... the growth point, especially in a backward or stagnating region, is a point of entry through which dynamism and a growth mentality can be injected in to the region.”

Such points will stimulate growth in surrounding areas and create primary as well as secondary employment. The increased employment and improved wage structures created by the growth industries are important stimuli for growth in other sectors of the economy.

Within a “port-city” growth points can usually be identified in the area surrounding the port. Export processing zones are one such development which have achieved great success.

Settlement theory

This theory is based upon the concentration of economic activity in certain areas.

In recent years, there has been a shift in the emphasis of development as follows:

- access to markets or cheap labour become of greater importance to industries than access to other natural resources. This has led to the relocation of many industries to regions which are either near to their market or where cheaper labour is available,
- the increasing dependence of industries on efficient infrastructure, which is one reason for the settlement of industries in the vicinity of ports.

When considering these theories, it is clear that the growth of a regional economy depends upon export potential or growth points which will ensure sustainable development. That development will not, however, be possible without the provision of sufficient and efficient infrastructure, which emphasises the importance of a well-developed port in the region.

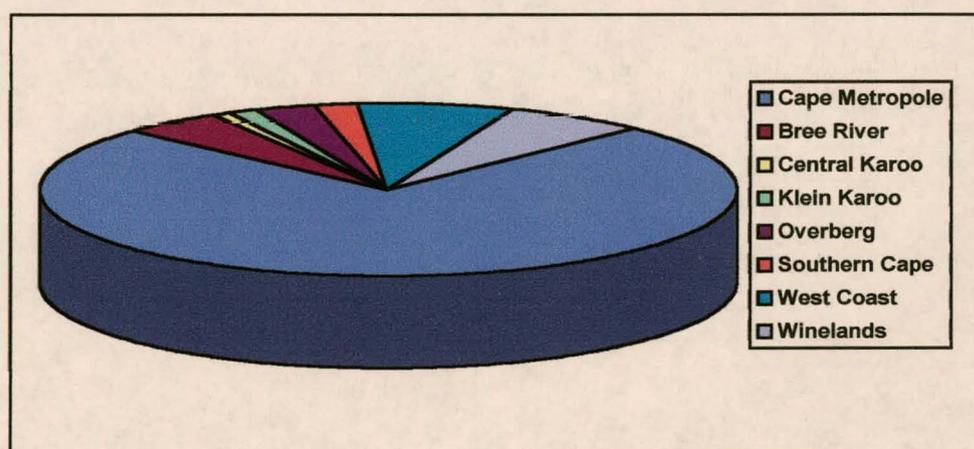
2.3 Overview of the Western Cape economy

Economic activity in the Western Cape is focused mainly on manufacturing, trade, financial and government services. The importance of the trade sector is largely supported by tourism. Although agriculture contributed only 6,15 % to the Gross Regional Product, it remains a significant job creator (9,1 %), especially outside the Cape Metropole.

From a geographical point of view, the Cape Metropole contributed approximately 74% (1997) to the provincial economy. Economic activity in

the rest of the province, with the exception of some new industrial development along the West Coast (Saldanha Steel & Namaqua Sands), consists mainly of agriculture. However, that agricultural activity plays a major role in the earnings of foreign currency through exports, in particular fruit. The Port of Cape Town plays a major role in the export of agricultural commodities. Climatic factors and international competition as well as foreign import duties and subsidies influence the extent of those exports.

Figure 2.1 Contribution to GGP - 1995



Source: Die Burger, 25 Julie 1998

Table 2.1 Gross Domestic Product

	GDP in South Africa		GRP in the Western Cape	
	R million	Real growth	R million	% of RSA GDP
1994	385 092	2,5	53 874	13,9
1995	430 872	2,9	60 500	14,0
1996	484 057	3,1	67 600	14,0
1997	529 557	1,7	74 600	14,1
1998	575 000	1,8	81 800	14,2

Source: Wesgro, The Western Cape Economy on the way towards Global Competitiveness with Social Stability, April 1998

According to Wesgro (April 1998), the process of international - and by implication national and regional growth - is in the long run determined by the following trends:

- * heightened environmental awareness
- * IT revolution
- * spread of private-public partnerships
- * strengthening of regional blocks
- * rise in quality standards of world trade products and services
- * just-in-time production discipline
- * globalisation of corporate head offices

The short-term trends, which are also applicable to economy of the Western Cape, can be summarised as follows:

- * a comparatively high and stable GDP growth amongst key industrial trading partners, in particular the US and the UK. Those countries' economies have a significant impact on the South African economy because of the imports they provide.
- * an acceleration in GDP growth of African economies, and especially the economic performances by amongst other Ghana, Tunisia, Uganda, Mauritius, Botswana, Mozambique and Morocco to which South Africa is a potential exporter. The ports of South Africa also play an important role as the so-called "gateways" to those countries.
- * a turnaround in the Southeast Asian economic performance, with wide-ranging implication expected for other emerging economies including South Africa, and by implication, the Western Cape.
- * the destabilising effect of El Nino on agricultural output.
- * stronger competition in raw material markets and between agricultural products worldwide
- * continued, though declining interest in the "South African miracle"
- * increasingly critical views about South Africa's handling of the reform and development implementation process, with particular focus on the crime issue, which influence tourism.

All of these trends touch the livelihood of the population of the Western Cape in a direct or indirect way. International trade is an important feature in these trends and has a major impact on port activity.

Globalisation can be seen as a major trend, the effect of which needs to be explained. The result of globalisation is increased international trade with increased imports due to the dismantling of import controls and new export opportunities. However, the balance between increased imports as well as exports determines the real impact on the economy of a region, which depends upon its competitiveness.

The Western Cape has always imported most of the manufactured and agricultural products which it requires, except when transport costs are prohibitive or where it has a competitive advantage.

Its distance from the main markets has for long forced Western Cape producers of household goods, clothing and other (semi-) durables to focus on high-value added products in order to compensate for transport cost.

The following is an estimate of the total exports from the Western Cape for 1996:

Table 2.2 Exports from the Western Cape region - Rand value

	R million
Minerals - incl. Exports via Saldanha	3 200
Agricultural raw materials	1 850
Fishing products	400
Processed food products	1 250
Beverages (incl. Wine)	900
Clothing & textile products	2 000
Chemical products, paper & paper products	1 700
Base metals	900
Machinery (electrical etc.)	850
Transport equipment	1 400
Other manufacturing	600
Other exports	1 200
Total exports	16 650
	(RSA : R 125 725 million)
Est. Total Exports for 1997	19 000
	(RSA : R 142 938 million)
% of 1996 RSA merchandise exports	16,4%
% of total RSA exports (incl. gold)	13,2%
	(1997 13,3%)

Source: Wesgro, The Western Cape Economy on the way towards Global Competitiveness with Social Stability, April 1998

2.4 The importance of the Western Cape economy in comparison with the rest of South Africa

Table 2.3 contains a comparison of the indicators of the extent of the economies in the provinces of South Africa.

Table 2.3 Comparative statistics for provinces

Region	Population (millions)	Population %	GDP %	Unemployment %
Eastern Cape	5.9	15.6	7.6	41.4
Free State	2.5	6.6	6.2	26.1
Gauteng	7.2	19.0	37.7	20.9
Kwa Zulu Natal	7.7	20.4	14.9	33.1
Mpumalanga	2.6	6.9	8.2	33.4
North West	3.0	7.9	5.5	32.8
Northern Cape	0.7	1.9	2.1	27.2
Northern Province	4.1	10.8	3.7	41.0
Western Cape	4.1	10.9	14.1	16.8
RSA	37.8	100	100	2,1 million

Source: Wesgro, The Western Cape Economy on the way towards Global Competitiveness with Social Stability, April 1998

The Western Cape economy compares favourably with the economies of other South African provinces. Unemployment is estimated at only 16,8% compared to a national average of 29,3%. The per capita income is also 70% higher than the national average. This may be attributed to the composition of the labour force and the economic activity in the province.

The following table illustrates this composition:

Table 2.4 Socio-economic indicators

	Western Cape	RSA
Urbanisation level	87%	56%
Human development index	0,81	0,68
Literacy rate	76%	63%

Source: Wesgro Annual Review 1998

According to Wesgro's report on global competitiveness, various factors contribute to the comparative superiority of the Western Cape economy. The provincial economy is already attuned to the international economy, and able to

capitalise on renewed international links. This is particularly true in the fields of tourism, skilled manufacturing and processing of agricultural products.

Furthermore, the agricultural economy is vibrant with high levels of infrastructure service, particularly in the fruit and wine-growing areas.

2.5 Infrastructure

Another way to assess the structure of the Western Cape economy is to compare this region with similar regions in other countries.

Other international examples can be drawn from Australia and Spain where port cities are distant from the population and business centres of their respective countries. Their economies have a strong export orientation, major harbours and shipping related activities, a comparatively broad based economic structure (because of high transport cost to the centre) and a relatively large business and financial services sector. Given their often long and proud history as harbour metropolises, these centres generally have a well-developed education and training infrastructure, which strengthens their competitive position in the global economy.

2.6 Sector allocation

Table 2.5 illustrates the estimated contribution of each of the main economic sectors in the Western Cape to the gross regional product and the creation of employment.

Table 2.5. Economic Sectors in the Western Cape (1998 estimate)

	Labour Input (%)	Gross Regional Product (%)
Agriculture, forestry & fishing	9,1	6,15
Manufacturing & mining	14,8	23,7
Construction & repairs	7,5	3,7
Electricity & water supplies	0,7	2,8
Trade	7,2	12,02
Tourism, include catering & accommodation	8,4	8,95
Transport & communications	6,3	8,33
Financial & business services	5,8	16,4
Government & community services	16,1	14,0
Survival activities & unemployed	18,2	3,95
TOTAL	1 823 000	100 ⁽¹⁾

Source: Wesgro Annual Review 1998

(1) Total value: R81 800 million

Based on Wesgro's sector studies and surveys, Table 2.6 lists 27 sectors of industries of sector-niches with distinct growth potential.

Table 2.6 Western Cape growth and investment sectors

<p style="text-align: center;">A</p> <p style="text-align: center;">PRIMARY SECTORS</p>	<ol style="list-style-type: none"> 1. Agriculture - deciduous fruit, table olives, rooibos, high value vegetables, herbs, organic products, nuts 2. Mariculture & aquaculture – mussels, perlemoen, oysters, tropical fish, trout and seaweed 3. Floriculture – proteas, fynbos, cut flowers 4. Mining – West Coast - dimension stone, kaolin, phosphate, silica, zinc
<p style="text-align: center;">B</p> <p style="text-align: center;">SECONDARY SECTORS</p>	<ol style="list-style-type: none"> 5. Food processing - high value-added fruit, vegetables, oil seeds, ostrich and other meat products 6. Beverages & wine - fruit juices, rooibos tea, wine and wine derivatives, other alcoholic beverages 7. Textiles & clothing - high quality niche products 8. Steel & metal processing - Saldanha Steel downstream processing, stainless steel tanks, steel service centre 9. Precision engineering & automotive components - low bulk, high volume products 10. Furniture - high quality and completely knocked down products 11. Telecommunications - components and high-tech equipment 12. Medical devices and high value plastic products 13. Boat building - blue water sailing boats and motorised boats 14. Art & craft products - and designer jewellery 15. Construction and building materials including wooded frames, kitchen cupboards and pre-cast materials 16. Ship repair and container facilities
<p style="text-align: center;">C</p> <p style="text-align: center;">TERTIARY SECTORS</p>	<ol style="list-style-type: none"> 17. Tourism - eco- and adventure tourism, incentive tourism, conferences, health and general tourism 18. Trade - wholesale, retail, import/export and direct/mail order 19. Financial services – general and specialised banking, fund management, insurance and other specialised services 20. Education & training - private & partnership education, curriculum development, insurance and other specialised services 21. R & D activities - hi-tech, technology transfer, sector support 22. Media & film industry - TV, video, features and commercial, publishing 23. Professional/consulting services - engineering, accounting, architecture, design, environmental protection, advertising and marketing, property brokering 24. Headquarters - Southern African, national and regional head offices 25. Gas, oil and diamond exploration services - West Coast and Bredasdorp (Mossgas) 26. Retirement industry - and related health services 27. Culture, sport and recreation

Source: Wesgro, The Western Cape Economy on the way towards Global Competitiveness with Social Stability, April 1998

The realisation of such potential, however, depends on different developments, such as:

- the introduction of new products or services into existing sectors/niches/ firms
- the expansion of the qualitative improvement of the output of existing products/services, for either local or export demand
- the greater diversification of firms into existing or new sub-sectors
- the development of downward or upward linked enterprises in growth sectors
- the entering of new national or foreign players into local sectors
- the transformation of informal operation into formal enterprises in existing or new sectors
- the upgrading of skills in existing sectors, which enable firms to enter export markets or compete more effectively with imports

The importance of international trade is clear in all of the above sectors and industries mentioned in Table 2.6. Therefore, all of the development mentioned above will impact significantly on the development of the port and vice versa.

2.7 Closing remarks

The prospects for the Western Cape economy appear to be positive when compared with the rest of the country. However, the province can not be seen in isolation and major economic trends such as the devaluation of the Rand and the rise in interest rates in the first quarter of 1999, impact on the entire economy and no province can escape that effect.

The question is being asked as to how a port city can function successfully and trade globally when the control of its port is in the hands of a national agency apparently bent on using its net revenue to cross-subsidise other regions. What is the impact thereof on the economy and what should the Port Authority's future policy be with regard to the development of regional economies?

The message is clear: performance efficiency in the port can increase the competitiveness of the regional economy through the creation of an enabling environment. In practise, that will mean the mobilising of funds, strengthening exports, and other help to increase the value added with the same resources.

Chapter 3

3. The Development of the Port of Cape Town

3.1 Historical development

Following the formation of the English and Dutch India Companies in the early 17th century, Table Bay became a logical stop-over for seafarers en route between Europe and the East. Fresh water and fruit abounded, meat was bartered from local inhabitants, mail could be exchanged and ship repairs could be undertaken. Except for the northwesterly gales during the winter months, safe anchorage could be found in Table Bay. In 1652, Jan van Riebeeck arrived to establish a permanent settlement. A fort and small wooden jetty were built on the then shoreline. The wooden jetty remained the focal point of attraction for more than 200 years.

That was the beginning of the famous Cape hospitality and the Cape soon became known as the “tavern of the seas”.

On Monday 17 September 1860, sixteen year old Prince Alfred tipped the first load of rubble on the breakwater site for the building of the Alfred Basin. This marked the start of the construction of the Port of Cape Town, as we know it today. During May 1865, the worst gale in living memory hit Cape Town and badly damaged the breakwater. Eighteen ships sank, including the union steamer “*Athens*” with the loss of all on board. Finally, on May 1870, both the inner and outer basins were ready and the first ship the “*Haitenne*” was berthed.

The official opening was on 4 June 1870, when Prince Alfred, by then the Duke of Edinburgh and Captain of the “*HMS Galatea*”, arrived in the Cape. In 1882, on October 22, the Robinson Graving Dock was officially opened and the “*Athenian*” became the first ship to use the facility. It has been in constant use since and is

perhaps one of the oldest commercial dry-docks originally built to accommodate tall ships, still in use

The depression and the opening of the Suez Canal on 17 November 1869 alleviated some of the pressure on the newly opened Alfred Basin, but within a few years the discovery of gold in South Africa had caused the country to swarm with prospectors who all arrived by sea. Also, between the initial design of the Alfred Dock and its opening, ships had doubled in size and it became clear that another bigger dock would be needed. From then on the port expanded much as it had started, with depressions and wars interspersed with sudden rushes of activity.

The following dates are important in the development of the Port of Cape Town:

- 1488 - Bartholomew Diaz rounded the Cape
- 1652 - Jan van Riebeeck established the first European settlement in Southern Africa
- 1825 - First Steamship - "*SS Enterprise*" arrived
- 1870 - Alfred Dock completed
- 1882 - Robinson Dry-dock completed
- 1905 - Victoria dock completed
- 1936 - A, B, C and D berths completed
- 1945 - Duncan Dock and Sturrock Dry Dock completed
- 1966 - First tanker arrived
- 1968 - Shiplift built
- 1975 - Ben Schoeman Dock completed
- 1976 - RoRo quay completed
- 1977 - Deep-sea and coastal container berths completed
- 1990 - SA Harbours officially renamed Portnet on 1 April
- 1991 - Construction of the Duncan Dock Cold Store
- 1992 - Construction of the Fruit Terminal at B, C and D berths
- 1998 - Construction of the Combi terminal

From this brief historical overview of the ongoing development of the Port of Cape Town, it is obvious that the port must have played a major role in the development of the economy of South Africa and its trading partners. Being on one of the world's then major sea routes (before the opening of the Suez Canal), the port was a natural stop over for many ships and its existence no doubt also facilitated the development of other economies.

3.2 Port development

The effective development of a port depends on a number of variables of which the optimal utilisation of available land is certainly the most prominent. The need to pay close attention to planning land use in port areas begins at the moment the idea of port development arises and does not stop until a port is closed. Land is a limited resource, which can be even more limited by the way a port is planned and administered. The world is full of examples of ports, which have been seriously affected by a lack of attention to land use planning.

The purpose of this study, however, is to analyze the impact of the port on the region in which it is situated and therefore it is important that more attention is paid to other factors influencing the development of the port.

As well as having to solve technical problems, port administrations have to adjust to human and political influences and their skill in dealing with external relationships can often contribute greatly to the success of the development of the port. As a service industry, a port's existence arises from the external factors and a successful interpretation of these factors will ensure that the port does not outstrip the demands of its users and will make for financial success.

External relationships can take many forms. They include the inter-reactions and stimuli between port and hinterland which arise from the industrial growth in the region, market demand and economic circumstances, creating pressures on the

port to expand, improve or reduce services. They also include relationships between the port authority and the formal representation of its hinterland in the form of regional or even national governments and councils.

Obviously, the port must have regard in land use planning to the nature and extent of influences from its hinterland and foreland, but also of the influence the port will have on the development of its hinterland and foreland. These dictate the types and levels of trade, which will require facilities.

The following relationships are of particular importance in the development of a port: In understanding these relationships the port will make a vital contribution to the development of the region through the effective planning and development of the port in itself.

- co-ordination of national, regional and port objectives
- development of communications
- competition for scarce resources including land

Co-ordination of national, regional and port objectives

The port can greatly be affected by decisions of national and regional government so that constant vigilance of events and official liaison is necessary. The responsibility for vigilance rests on the port, which is in the best position to recognize its best interests. Typical decisions on policy at regional and national government level, which can affect the demand for a port's services and, through that, its land requirements, include:

- National policy for investment in ports
- Conservation – the choice of areas close to ports for conservation and the restriction of some port activities. Policies of this sort usually arise from strong

political pressures but factual guidance from the port concerning effects or controls can often be of significance.

- Industry – industrial units are becoming larger and the need for more finance for industrial development brings in government investment. Political pressures on government can often influence the areas in which such investment is made.
- Most modern countries undertake town and country planning to secure the best use of land resources. This task usually devolves upon regional governments, which will need expert maritime advice concerning the demand and potential of ports in their area and their relationship with structure plans.

Development of communications

A port is part of the chain of communications between hinterland and foreland. Therefore it is greatly affected by the nature and quality of the other parts of the particular chain. The efficiency of land links with the markets which a port serve impacts significantly on the development of that port as it influences the cost of imports and exports, which in turn will affect the national and regional economy. Furthermore, that will impact on the demand for land by encouraging investment and growth. Where, as in South Africa, there are a number of ports, their comparative attraction will depend upon their relative distances from the market and efficiency of land transport links. A port should always be in a position to advise the regional and national governments of its changing needs and of the improvements in communications, which may be required.

Competition for scarce resources including land

Port land is highly specialised, as it must be sited near suitable maritime structures. These structures are extremely expensive to provide so that if they already exist, there are strong financial reasons for not changing location. If, however, they do not exist, suitable sites for their construction are becoming increasingly scarce because of the emerging demands of shipping for deeper water and specialised

facilities, including land space. In some cases, there may be competition for such sites because of the lack of any alternative space for non-maritime development or for leisure purposes. The development of the Victoria & Alfred Waterfront is an example of such pressures on the development of the Port of Cape Town. That stems from factors such as a dense population, a small total land area in the region and physical and climatic factors where, for example, a mountain or arid interior confines development to coastal areas. In other cases, the economic characteristics of a prosperous seaport often attract developments of a non-maritime nature in order to take advantage of the pool of skilled labour or to sell to the surrounding market. Common sense indicates that because of the highly specialised use of port land, development, which does not require its specialised characteristics, should be located elsewhere. Proper consideration should also be given to importance of the port to the regional economic development.

3.3 Infrastructure and port services

The Port of Cape Town is a full service, general cargo, and deep-sea port. The port comprises the area from the Milnerton lighthouse to Robben Island to the Green Point lighthouse and is owned and operated by Portnet, a division of the State-owned Transnet Limited.

Port infrastructure in the commercial port comprises the following facilities, which are included in the layout of the port illustrated in figure 3.1 on page 42.

a) Cargo handling

General and bulk cargoes are handled in the Duncan Dock, which comprises eleven berths equipped with wharf cranes and forklifts.

Open and under-cover storage facilities are available as well as two cold-storage facilities, being the Duncan Dock Cold Store for the storage of mainly fish and the IHS pre-cooling facility for the export of deciduous and citrus fruit.

Also situated in the Duncan Dock is the newly developed Combi terminal for the accommodation of multi-purpose vessels.

Containerised cargo is handled in the Ben Schoeman dock, which is served by seven gantry cranes and a straddle carrier operation. This terminal is operative 24 hours a day, seven days a week.

The Inkunzi, a floating crane, with a lifting capacity of 200 tonnes, can handle abnormal cargo loads

b) Shiprepair

Shiprepairs are facilitated by two dry-docks, the 360 m long Sturrock Dry-dock and the Robinson Dry-dock, as well as a Syncrolift and a repair quay.

Numerous shiprepair, salvage, towage and diving services are available.

c) Bunkering

There are sixty-one bunkering points in the Port of Cape Town. Marine fuel, gas oil and various blended fuels are available at most berths as well as fresh water and ship chandelling services.

d) Pilotage and navigation

Navigation within port limits is the responsibility of Port Control, which provides a 24-hour communication with arriving and departing vessels. Safe anchorage is provided within the area between Mouille Point lighthouse, Robben Island and Milnerton beach, with vessels being constantly monitored on modern radar equipment.

Sea rescue services are also co-ordinated from Port Control using the National Sea Rescue Institute and helicopters in conjunction with the Maritime Rescue Co-ordination Centre.

Pilotage is compulsory.

e) Craft assistance

The port operates four Voith Schneider tugs, each with a bollard pull of 41 tonnes, ensuring safe and efficient ship handling. Harbour launches and smaller tugs assist with small craft movements and the running of ships' lines when required.

f) Stevedoring

The following services are available:

- planning of cargo working
- opening and closing of hatch covers, stowage of cargo, building of cargo separations, lashing and securing of cargo.
- breaking-out of cargo
- operation of ships' lifting gear for landing or shipment of cargo
- operation of on-board cargo working equipment
- hatch and tank cleaning

g) Helicopter service

A privately owned helicopter service is available for passing tankers and other vessels not wishing to call at the port or for those unable to enter because of their draft. This facility may also be used for emergency medical services, mail stores and airlifting technicians and spare parts.

3.4 Statistics : port activity

Source: Portnet Statistics

Table 3.1 Total tonnage handled (harbour tons)

	1995	1996	1997
Containerised	3 721 493	2 967 998	3 227 104
Bulk	209 448	457 985	416 331
Breakbulk	3 250 665	2 822 086	3 391 449
Petroleum	3 875 981	2 828 056	5 593 980
Transshipment	587 804	533 949	435 225
TOTAL	11 644 491	9 610 074	13 064 090

Table 3.2 TEU' s handled

	1995	1996	1997
Landed	153 560	160 427	158 509
Shipped	154 128	156 873	157 874
TOTAL	307 688	317 300	316 383

Table 3.3 Vessel arrivals

NUMBER OF VESSELS	1995	1996	1997
Ocean going	1 938	2 081	2 302
Coasters	165	195	187
Foreign fishing	822	953	942
Others	387	178	204
SA trawlers	357	311	256
TOTAL	3 669	3 718	3 891

Table 3.4 Gross register tonnage of vessels calling

GROSS REGISTER TONNAGE	1995	1996	1997
Ocean going	91 266 241	110 258 418	123 224 793
Coasters	3 788 096	4 462 699	5 391 953
Foreign fishing	2 094 040	2 465 350	2 314 912
Others	1 403 714	1 897 709	2 712 866
SA trawlers	2 348 680	866 668	648 068
TOTAL	100 900 711	119 950 844	134 292 592

3.5 Port Community

The Port of Cape Town serves a broad port community. Each of the role players makes a vital contribution to the economy of the Western Cape and is responsible for significant job and wealth creation within the region.

The following groups within the port community are identified:

a) Organised Business

These opinion-forming bodies have a significant impact on the port. Bodies such as Wesgro and the Chamber of Commerce play a vital role in the development of the regional economy through the attraction of foreign and local investment.

Furthermore, the organised shipping fraternity (Association of Shipping Lines (ASL); the Association of Ships' Agents and Brokers of South Africa (ASABOSA) and the South African Association of Freight Forwarders (SAAFF) also play an important role in the organising of shipping and the business within the port.

The Port of Cape Town is under the management of Portnet, a state owned enterprise, and hence different government departments also influence the business of the Port and vice versa.

b) Privately owned terminals

Several terminals within the Port of Cape Town are owned and operated by private enterprises. The land infrastructure is leased from Portnet at an average lease income for Portnet of R 31 million per annum.

These terminals are responsible for the provision of storage and cargo handling facilities. The economic benefit of these facilities will be discussed in Chapter 6

c) Oil industry

The Port of Cape Town is an important port for the loading and discharge of petroleum products, with a total throughput of approximately 3 000 000 volumetric tons per annum.

The location of the 110 000-bpd Caltex Oil refinery in Milnerton can largely be attributed to the existence of the port.

d) Bunker suppliers

Bunkers are supplied by Joint Bunkering Services (JBS), which is managed by BP South Africa. The Caltex Oil refinery supplies a variety of fuels and lubricants for vessels calling at the port.

Most berths in the port are supplied with bunkers via an 11-km pipeline, connecting the port and the Caltex refinery, and a barge.

JBS delivered 823 million liters of fuel oil and gas oil - split roughly 50:50 - to 2 426 vessels in 1996.

Cape Town is known as one of the ports in the world with the most competitively priced bunkering. This serves as a major attraction to passing ships and contributes significantly to the revenue base of both the port and the bunkering industry.

e) Cargo owners

Cargo owners are the reason for the existence of any port. Cargo owners create the demand for port services and although they might not be directly involved in shipping activities because of their use of shipping agents and clearing and forwarding agents, they are the real driving forces behind the development and prosperity of a port and its community.

f) Clearing & forwarding agents

Clearing & forwarding agents are the link between the importer, exporter, shipping line and Port Authority and Operator.

These agents are responsible for managing logistical arrangements on behalf of cargo owners. This may include activities such as customs clearing; freight forwarding; marine insurance; project cargo; warehousing and container groupage

Depending on the nature of activities performed by these enterprises, they comprise mainly a service intensive industry and are not a significant creator of employment in a port.

g) Cold storage facilities

Cape Town, being seen as the reefer (refrigerated cargo) port of South Africa, relies significantly on the provision of efficient cold storage facilities in the vicinity of the port.

There are three reefer facilities within the port, namely:

- International Harbour Services for the export of deciduous and citrus fruit
- Duncan Dock Cold Store for the storage and handling of fish
- Cross Berth Cold Store for the handling of fish

Furthermore, various other cold storage facilities exist outside the port from where export commodities, in particular fruit, are exported throughout the year.

h) Container depots

Container depots provide importers and exporters using containerisation as a mode of shipment with a service for the packing and unpacking of containers. Containers are also washed and repaired

These services are vital to the performance and development of containerisation, which has been the main growth area in shipping and in ports for the past decade.

i) Container operators

Working closely together with shipping lines and container depots, container operators are a further important link in the handling of containerised cargo through the port.

j) Shipping lines and agents

Shipping lines and their agents are the main users of a port. South Africa has only two shipping lines owned and operated by South African companies, i.e. Safmarine and Unicorn. These companies contribute significantly to the economy, and operate globally, earning foreign exchange.

k) Equipment suppliers

A port being a capital intensive operation needs sophisticated and well maintained equipment to meet the needs of its users.

Mainly foreign firms, whose existence results in an outflow of currency, supply South African ports with cargo handling equipment and contribute a leak in the multiplier effect of the contribution which the port makes to the economy.

l) Fishing industry

The Port of Cape Town hosts a number of foreign as well as local fishing fleets, which use the port as a logistical base.

Apart from the revenue accruing to the port, these users make a vital contribution to the regional economy. Vessels are repaired, bunkers and stores bought and crew are repatriated. Furthermore seamen on board these vessels spend their earnings in the City.

A more detailed description of this contribution will be dealt with in Chapter 7.

m) Port services

Within the boundaries of any port, various other services are performed. In the Port of Cape Town, these services include a helicopter service provided by a privately owned operator and the services of seaman's welfare organisations and ship chandlers.

n) Shiprepair

The Port of Cape Town has three separate shiprepair facilities. The city's strategic location at the southern tip of Africa results in the Port receiving quite a number of ships calling for the purpose of repair. The industry contributes significantly to the local economy, as several shiprepair companies are located within the port. Those companies are all labour intensive, creating employment for a large number of skilled and unskilled workers.

o) Stevedores

Shipping lines are the most obvious beneficiaries of the eleven privately owned stevedoring companies established in the port. Other beneficiaries include shipping agents, exporters, farmers, manufacturers, and the entire regional economy.

The stevedoring personnel - approximately 500 - are responsible for the handling of cargo on board vessels in the port. Those firms play a vital role in the competitiveness of the Port and the economic well being of the region.

p) Recreation

The port also hosts two yacht clubs.

3.6 Description of Hinterland

According to Bown (1967), a port should attract to itself, from across the sea, all the import traffic destined for points within a certain area about itself, and also all the export traffic arising from that same approximate area. That notion presupposes that most inland towns, factories, markets and warehouses will be in transport communication with one particular port which, being the nearest, will be cheaper to use than any other. If that were true, and if there were no modifying factors, the port hinterlands of the world could be drawn upon the map with great accuracy. The facts are, however, that transport facilities to the nearest port are not always adequate, are not always the most suitable and are not always cheaper than others. Moreover, one or more of the following considerations always affects the flow of traffic between inland points and the ports:

- The value of ship's time – ship owners strive to keep their port calls to a minimum as revenue is earned only while at sea and not while in port. In fact, more port calls results in additional expenditure
- Port capacity and port facilities – specialised facilities are needed for the handling of certain cargoes. The port of Cape Town's hinterland therefore extends as far as Mpumalanga for certain exotic fruits as result of its specialised reefer (refrigerating) facilities.
- The influence of the markets – the great established markets, in particular markets for commodities, are not always to be found where the goods are used, or the goods may be used at many different places whilst marketing centers may be few. The great markets for imported goods tend to center themselves at a few major ports.
- Two-way trade – an inward-bound vessel bringing the raw materials or manufactures will sometimes discharge at a port which is not the nearest to the inland destination, the reason being convenience of access to outbound cargoes.
- Established bases – ship owners tend to set up bases where their ships call frequently.

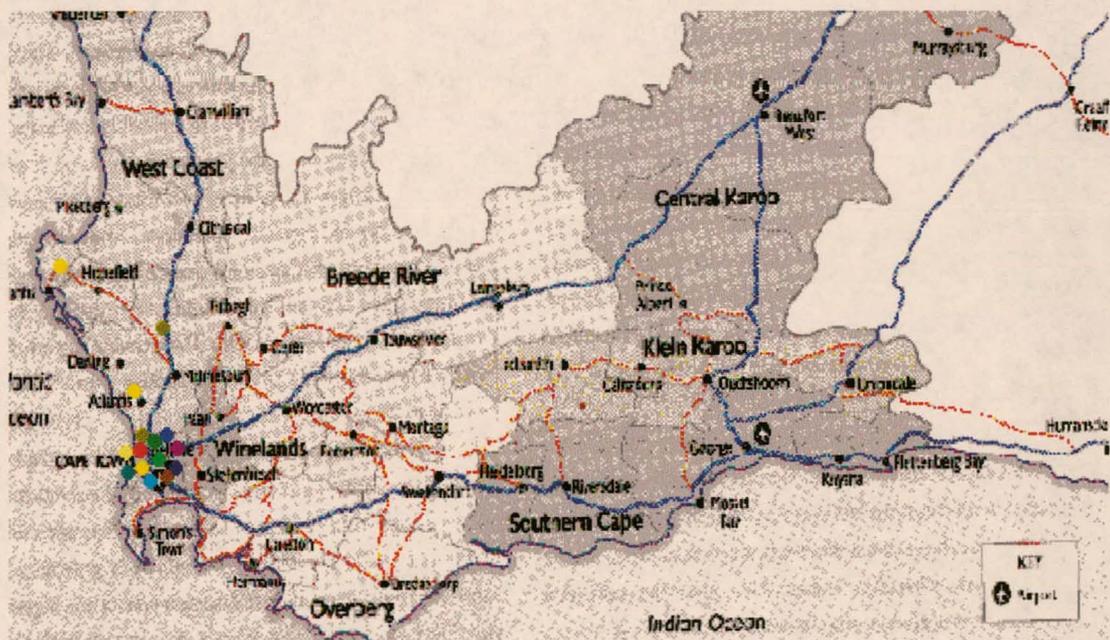
- The paying load and the cargo nucleus – a cargo vessel will try to limit its visits to a few ports where sufficient cargo is regularly obtained or available to make each voyage a financial success. Having thus established the prospect of a regular cargo nucleus, the owner will be prepared to take other cargo, for or from more distant points, up to the limit of his ship's capacity. It may not be worthwhile to visit ports nearer to the origin or destination of that specific cargo.
- Repairs and dry-docking
- Agreed railway charges – the national railway operator (Spoornet) may decide to equalise rail tariffs between ports, which will have a major impact on the natural hinterland of the ports.
- Port charges

Natural Hinterland

Imports:

Figure 3.2 illustrates the natural hinterland of imported cargo through the Port of Cape Town and table 3.5 gives detail as to the contribution of each major industry to the economy.

Figure 3.2 Imports: Natural Hinterland



**Table 3.5 Major imports through the Port of Cape Town to its hinterland
(excluding petroleum products)**

	Commodity	Employment within the natural hinterland	Contribution to GDP (R million)	Volume (harbour tons) imported (1997)	Value of imports
1	Chemicals	14 000	2 700	325 734	1,269,638,708
2	Mechanical & Electrical Appliances	12 000	1 012	239 620	5,659,711,223
3	Agricultural Products	⁽¹⁾ 164 000	4 676	213 819	370,598,433
4	Fresh/frozen meat			110 621	257,911,587
5	Fresh/frozen fish	30 000	1 500	98 364	10,407,136,140
6	Maize			211 284	233,563,245
7	Rice	⁽²⁾ 46 000	3 280	77 287	152,312,328
8	Barley			224 175	317,587,482
9	Beverages	⁽³⁾ 125 000	9 013	74 015	440,400,371
10	Textiles	65 000	2 690	98 044	996,035,326
11	Paper	23 000	1 655	138 015	730,428,169
12	Timber	⁽⁴⁾ 18 500	758	105 157	490,654,365
	Coal	⁽⁵⁾ 12 000	2 083	119 352	73,729,593
14	Household & personal effects			90 271	1,019,891,363
15	Hardware/tools/paint			73 366	346,890,013
	Totals for major Imports	509 500	29 367	2 199 124	22 766 488 346
		12,4%	39,4%	29,4%	89.61%
TOTALS					
	• Population	4 100 000			
	• GRP		74 600		
	• Cargo handled			7 470 110	
	• Value of cargo all handled (imports)				25 405 764 726

Source: Portnet statistics; Western Cape Economic Monitor, Prospects for 1998 and beyond

- Notes: (1) The agriculture industry includes all agricultural activity (agriculture, forestry and fishing) in the region, thus commodities 3,4,5,6,8
- (2) The contribution of imported rice is accounted for under the processed foods industry's contribution to the GDP
- (3) Commodities 9,14,15 is accounted for in the contribution of "Trade" as sector contributing to GDP
- (4) Timber imports are accounted for under "Wood and Furniture" industry's contribution to GDP
- (5) Coal is used at the Athlone power station for electricity generation.

Exports:

Figure 3.3 illustrates the natural hinterland from which cargo is exported through the Port of Cape Town and table 3.6 gives detail as to the contribution of each major industry to the economy.

Figure 3.3 Exports: Natural Hinterland

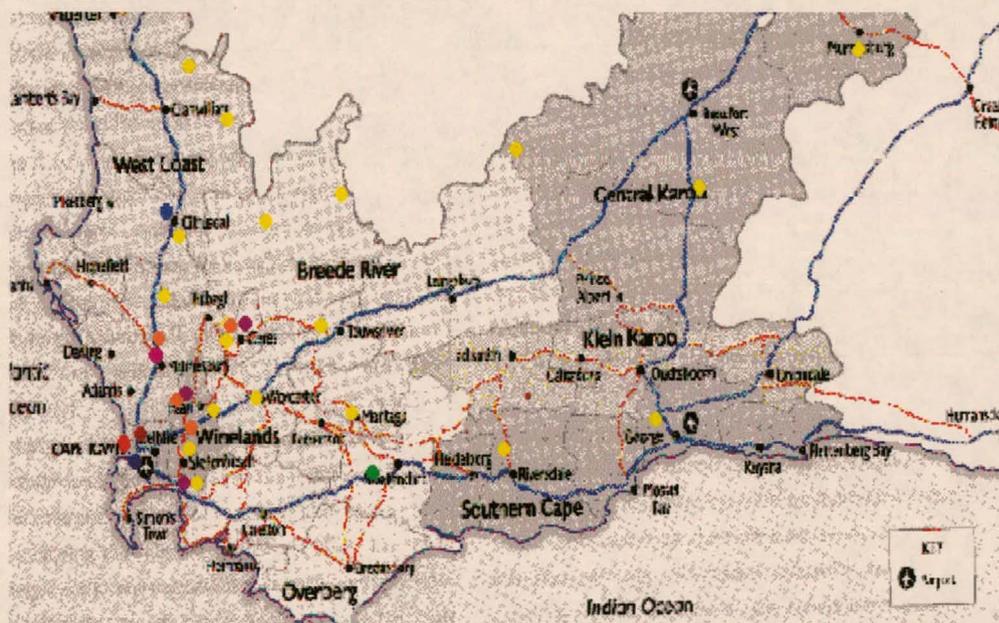


Table 3.6 Major exports through the Port of Cape Town as illustrated in the above natural hinterland

	Commodity	Employment	Contribution to GDP (R million)	Volume Exported (1997)	Value of exports
1	Fresh/ frozen fish	30 000	1 500	127 110	516,373,011
2	Citrus fruit	(¹)210 000		291 573	292,535,396
3	Deciduous fruit			1 050 232	2,239,006,987
4	Barley	(²)164 000	4 676	112 152	190,175,210
5	Wheat			101 536	143,242,640
6	Prepared fruit	(³)46 000	3 280	149 677	592,144,725
7	Beverages	12 500	1 350	237 161	827,014,416
8	Cement & clinker	(⁴)13 500	636	105 127	76,555,452
9	Steel	(⁵)15 400	975	238 255	469,150,293
	Totals for major Exports	491 400	12 417	2 412 823	5 346 198 130
		12%	16,6%	32,3%	77,98%
TOTALS					
	• Population	4 100 000			
	• GRP		74 600		
	• Cargo handled			7 470 110	
	• Value of all cargo handled (exports)				6 855 653 589

Source: Portnet statistics; Western Cape Economic Monitor, Prospects for 1998 and beyond

- Notes: (1) Includes total fruit industry – commodities 2 and 3
 (2) Total agricultural, forestry and fishing industry is represented in this figure – commodities 1,2,3,4,5
 (3) Processed foods is represented by this figure
 (4) Non- metal minerals
 (5) Metal products

3.4 Closing remarks

The Port of Cape Town has since its opening in the early history of South Africa played a significant role in the development of a thriving economy. The initial purpose of the Port of Cape Town was to establish a trading post. Therefore, from a historical point of view, the role of a port as economic catalyst should not be disregarded.

Furthermore, the development of the Port as a function of optimal land usage impacts significantly on the economic development of the region. The

relative high value of land in the Cape Town area plays an important role in the future development of the Port to promote international trade and its multiplication effect in the economy, rather than the direct return on investment only should be taken into account when evaluating the viability of port developments.

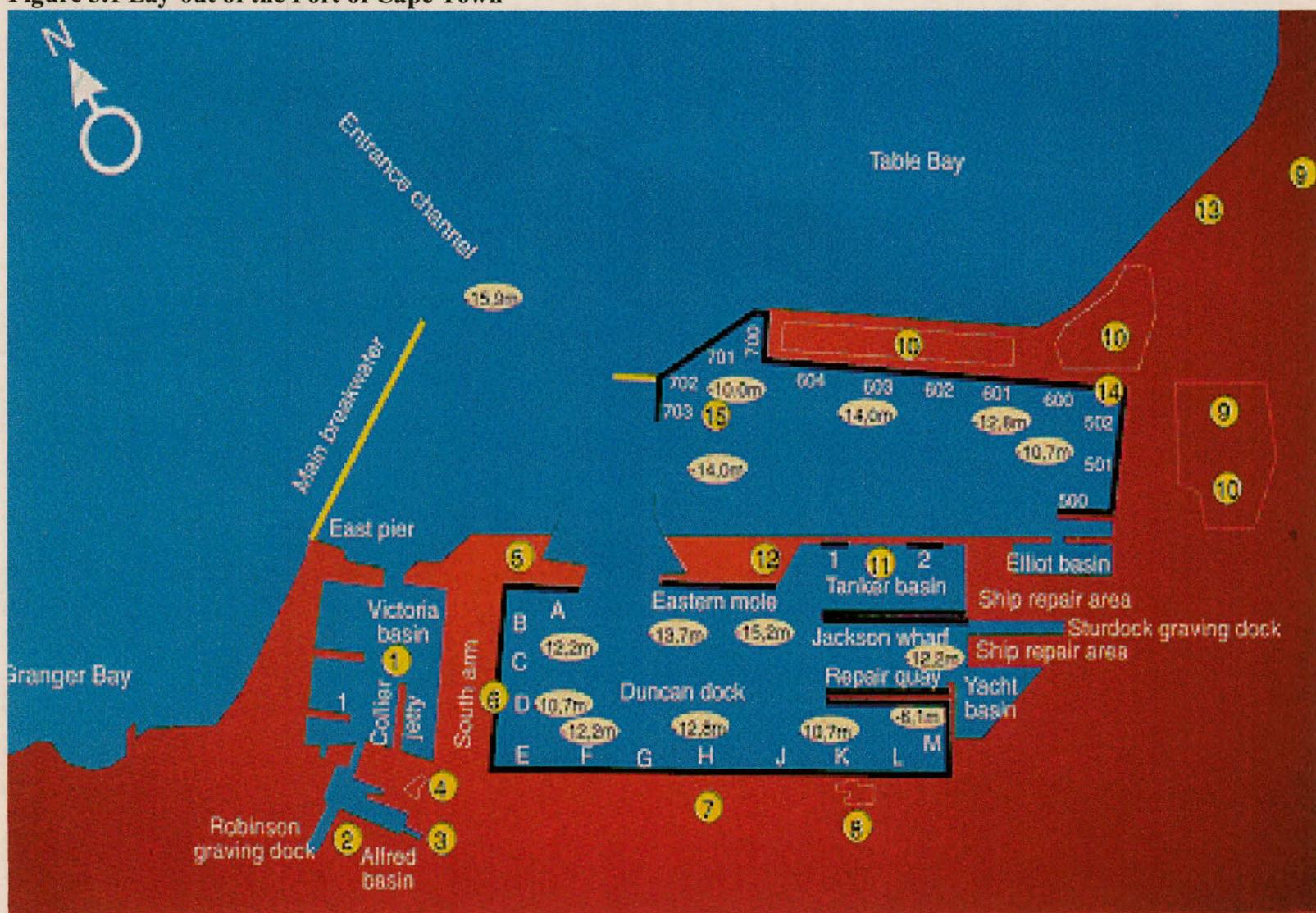
Being a full service port, its value does not end with imports and exports. The number of sectors it serves and the employment created in industrial and agricultural sectors contributes substantially to the development of the region.

It should also be considered that the existence of a full service port in a region of city, is an important factor to take into account when foreign investors evaluate the viability of investing in that specific region or city.

The contribution of each of these sectors in the port community will be discussed in Chapter 7.

Finally, the effect of the port on its natural hinterland was illustrated clearly in this chapter. It becomes clear that the port can be seen as a gateway to international trade and development in the region. However, it is important to note the effect of the efficient operation and development of the port on the expansion of its hinterland. This expansion will result in the growth of port activity originating outside the boundaries of the region (economic hinterland), and lead to an influx of economic wealth not dependent on the economic growth within the region itself.

Figure 3.1 Lay-out of the Port of Cape Town



Chapter 4

4. The Multiplier Effect

4.1 Definition

The multiplier effect in a broad sense implies that *The same currency in circulation generates many commercial transactions*¹.

The multiplier concept is based on the simple notion that the expenditure of one person represents the income of another. The expenditures of the second become the income of a third, and so forth.²

4.2 Theoretical background

The size of the multiplier, i.e. the number of multiplications, depends on at least three aspects:

- the economic activity involved
- the time period under consideration
- the size of the area being considered

¹ “The Monetary System’s ‘Multiplier Effect.’ Explained in Layman’s Terms.”

² “UA Centre for Business and Economic Research”

Economic activity

Boshoff (1974) is of the view that the multiplier may be triggered by various occurrences. The most common being:

- investment in the region irrespective of the origin
- an increase in the government spending within the region which is financed with funds originating from other regions
- increased consumer spending by tourists
- increased exports without a corresponding increase in imports
- increase in the local inhabitants' marginal propensity to spend money on consumer products

Le Roux (1991) describes the two multipliers most frequently used. These are the output (or production) and income multipliers.

Output multipliers measure the total direct and indirect input requirements from all the sectors in the economy needed by a particular industry due to an increase of R1,00 in the output of that industry. This usefully illustrates the degree of structural interdependence between the different sectors and the rest of the economy.

Income multipliers on the other hand quantify the effect upon the local income of a given increase in output. The income multiplier indicates the total direct and indirect income change in the local economy as a result of a R1,00 increase in the output. It is that multiplier which specifically will be used in this study.

Other variations, such as import multipliers, measure the import requirements of a unit of final demand for a product and its influence on the balance of trade.

Time period under consideration

Spending takes time. Therefore the size of the multiplier will differ for a week, month or year. The longer the period, the more the rounds of re-spending and the higher the multiplier.

According to Keynes (1936) the concept of the multiplier was one of comparative statics, where no time factor is considered. He illustrates that where there is an increment of aggregate investment, income will increase by a factor (k). The increment multiplied by k indicates the increase in income as a result of the investment.

Several later writers have emphasized the fact that the process of multiplying income takes time. Keynes' comparative statics - or timeless - multiplier has since been reformulated in a dynamic framework. Various references spell out the lags in the circular flow, which postpone the attainment to a new level of autonomous expenditure.

Size of the area under consideration

Should a multiplier for a specific region or geographical area be considered, it is necessary to take the size of the area into account. Some spending will leak out of the region to pay for services or products bought in neighbouring regions or imports from elsewhere. These leakages have the same effect, as does an increase in monies saved and therefore not re-circulated in the economy. Thus, the more money spent outside the region, the smaller the multiplier.

The smaller a region or city, the greater the leakages that will occur and therefore result in smaller multipliers. The size of the population also plays a vital role in this aspect.

The important factor determining the size of the multiplier for any community is not necessarily square kilometers, but rather the ability to capture all economic linkages within the community without allowing money to leak into other economies.

Formula for the calculation of the multiplier

Vermaak (1976) uses the following argument in developing a suitable formula to calculate the multiplier effect within a specific economy:

He defines the marginal propensity to consume as the additional quantity consumed with every increase in national income

$$\begin{aligned} \frac{\Delta C}{\Delta Y} & \text{ where } C = \text{propensity to consume} \\ & Y = \text{income} \\ & \Delta = \text{increment} \end{aligned}$$

From this, the multiplier can be calculated using the following formula:

$$K = \frac{1}{1 - \frac{\Delta C}{\Delta Y}}$$

In an open economy, it is, however, important to take the applicable leakages into account. This includes saving, imports, and taxes.

The formula should therefore be rewritten as follows:

$$K = \frac{1}{1 - (\Delta Y - (\Delta S + \Delta M + \Delta T)) / \Delta Y}$$

where Y= total disposable income
 S = total savings
 M= total spending on imported goods and services
 T = total taxes which are not spent in the region.

4.3 Criticism against the theory of multipliers.

Three major criticisms against this theory exist:

- the assumption of given and constant “marginal propensities” which determine the value of the multiplier.
- the neglect of the time needed for adjustment of the income flow to the changing rate of disbursements
- The neglect of a number of repercussions which the additional disbursements are liable to bring forth in the economy, (government expenditure, private investment and foreign trade).

These and other objections may indeed discredit the theory in as far as its application to specific situations is concerned, but its value for demonstrating possible relationships remains unimpaired.

Where, however, it is possible to qualify and reformulate varying propensities, time lags, and probable repercussions sufficiently, its predictive usefulness may be much enhanced.

Example of the relative bias of the multiplier effect in project evaluation³

The following example illustrates how the multiplier effect can influence the result of a project evaluation.

A developer may argue that the indirect benefits arising from the project are re-spent. Take, for example, where a port investment would give rise to employment. If the aggregate payroll for labour in the area would increase by \$10 million due to the investment, then the developer might argue that not implementing the project will deprive the area of \$10 million in workers' benefits plus benefits generated by the multiplier effect. The multiplier effect referred to is the sequence of re-spending as the workers use their newly acquired income to buy food, materials and other goods and services. The proponent of the port investment project might claim that the local businessmen will have increased sales and they in turn re-spend their profits, and so on. Thus, the initial \$10 million in workers' wages will be 'multiplied' as it is passed along the chain of re-spending by 3, 4 or even 5 times as the income is re-spent.

First, it should be pointed out that the \$10 million in additional wages is not necessarily a net benefit to the workers unless there is such rampant unemployment that the opportunity cost of labour is zero, i.e. these workers were previously idle and produced nothing. In so far there is not widespread unemployment; the opportunity cost of labour is not zero. Some workers may be diverted from other jobs, typically from the agricultural sector, where they might be under-employed. Say, for instance, the actual price of labour is 25 per cent more than the opportunity cost of labour. This means that the net increase (benefit) to the workers of the region associated with the project is not \$10 million but only \$2 million, since they were previously capable of producing \$8 million without the project. Now assume that this net benefit of \$2 million accruing to the workers is spent on food and clothing. The local retail industry will experience an increase of

³ "Appraisal of Port Investments, report by the UNCTAD Secretariat"

\$2 million in its gross revenues, but this does not mean a net increase in the regional income of that amount. The retail industry incurs expenses for labour, capital and materials, all of which could have been employed in other alternative uses, that is to say those resources also have opportunity cost associated with them.

Depending again on what the situation is like in the re-spending market, the net increase in income is some percentage of the first round of re-spending. If, for the sake of argument, goods in all markets are priced 25 per cent more than the opportunity cost of their input, then the second round of re-spending of the \$2 million would be $(0.25 \times 2 =)$ \$0.5 million; the third round of spending would be $(0.25 \times 0.5 =)$ \$0.125 million; the fourth would be $(0.25 \times 0.125 =)$ \$0.03125 million and so on. It is obvious that after a few more rounds the re-spending tapers off. Even taking the re-spending to be infinite, it can be shown that the sum of this stream of re-spending is only \$2.667 million, which is only 26,67 per cent of the original \$10 million and far from the multipliers of 3, 4 or even 5, as suggested by developers and proponents of a project.

4.4 Calculation of the Multiplier effect in the Port of Cape Town

4.4.1 Assumptions

The calculation of the multiplier effect of increased cargo handled through the Port of Cape Town has been based on the following assumptions:

1. Disposable income consists of :
 - profits made by Portnet
 - labour costs paid
2. The propensity to save is estimated at 4% of income (Source: ABSA Quarterly South African Economic Monitor, Second quarter 1999 (www.absa.co.za/monitor))

3. A percentage of 10% of expenditure occurs outside the boundaries of the Western Cape
4. No company tax is paid.
5. Average personal tax is estimated on 30%
6. The average tariff increase for 1998 was 6.8%
7. Inflation for 1997 was estimated at 9,7% (Source: Western Cape Economic Monitor)

4.4.2 Calculation

In the calculation of the multiplier effect of the Port of Cape Town as an independent entity, it was necessary to exclude the port's profits from the calculation as all profits are allocated to a centralised pool in Transnet from where distribution occurs.

The calculation is based on the 1997/98 financial year.

For simplification, the following formula, was used:

$$\frac{1}{1 - (\text{MPC} - \text{MPI})}$$

Where: MPC = Marginal propensity to consume
 MPI = marginal propensity to import

1. Marginal propensity to consume

To calculate this figure it was necessary to determine the percentage of an employee's salary or wage, which was not spent. To obtain than percentage, the rate of domestic savings as published was taken into account as well as the average personal tax rate, as published.

Therefore, MPC can be calculated as follows:

$$100 - ((\text{Personal savings} + \text{personal taxes paid}) \div \text{total labour cost}) \times 100))$$

$$\rightarrow \text{Personal savings} = \text{labour cost} \times 4\%$$

$$\rightarrow 176\,610\,893 \times 4\%$$

$$= 7\,064\,435.72$$

$$\rightarrow \text{Personal taxes} = \text{labour cost} \times 30\%$$

$$\rightarrow 176\,610\,893 \times 30\%$$

$$= 60\,047\,703.62$$

$$\rightarrow 100 - ((7\,064\,435.72 + 60\,047\,703.62) \div 176\,610\,893) \times 100))$$

$$= 100 - 34$$

$$= 66\%$$

Thus MPC = 66% i.e. 66% of income earned in the Port is spent

2. Marginal propensity to import

This figure represents the percentage of spending in the Western Cape, which is transferred outside its boundaries.

That percentage is estimated at 10%

Therefore, the MPI = 10%

3. Calculation of Multiplier effect

$$\frac{1}{1 - (\text{MPC} - \text{MPI})}$$

$$\rightarrow \frac{1}{1 - (0.66 - 0.1)}$$

$$\rightarrow \underline{\underline{2.27}}$$

4.5 Closing Remarks

In the application of the income multiplier to the Port of Cape Town as case study, it can be concluded that the income earned through profits made and the creation of employment in the Port significantly benefits the economy of the Western Cape.

Even if the profits earned are excluded from the equation, the benefit of the creation of employment can be illustrated through this simplified example. For every increase of R 1 million in the total labour cost of the Port, the effect on the consumer spending in the region will be R 2,27 million.

It should, however, be considered that this increase in labour cost should be justified by an equivalent increase in port activity and hence port investment. Therefore it can furthermore be concluded that increased spending by port users, and in particular the spending of foreign ship owners will benefit the economy substantially.

This increased spending in the port highlights the effect of the re-allocation of profit to a centralised pool of revenue in Transnet, which is not necessarily redistributed to the applicable regions. The multiplier effect of port revenue will increase from 2.27 to 3.9 should this occur. (See Annexure B)

This multiplier will be applied to other sectors of port activity in Chapter 8

Chapter 5

5. Employment associated with the Port of Cape Town

5.1 Introduction

This chapter deals with the creation of employment within the boundaries of the Port of Cape Town.

The degree of dependence of different activities in and around the Port varies considerably. In the Economic Impact Study of the Port of Southampton (Pieda, 1994), several categories of port employment are discussed. For the purpose of analyzing the Port of Cape Town, four of these categories of employment linked to the Port and the creation of employment therein are identified.

5.2 Employment categories in the Port of Cape Town

Operational employment

Activities directly related to the operation of the Port itself.

Port linked

Activities that are wholly dependent on the Port, but which are ancillary to its operation.

Port based

Activities of firms that are based close to or within port boundaries and are in one or more ways dependent on the Port. These companies may include:

- marine businesses that need access to waterfront facilities
- firms providing services to other port dependent firms, or in the marine sector

Port-located:

Activities of businesses, which lease land from the Port Authority, but are not dependent on the port for their business and would not suffer loss should the port be closed. This is only included for completeness sake.

Table 5.1 summarises the categories used for the analysis of employment and shows how the different businesses have been assigned to each category. The analysis was based on the areas of land leased in the port and the number of people employed by each lessee on the specific land.

In practice, there is a degree of overlap between categories. Many firms are engaged in a variety of business activities. For the purpose of analysis, companies have been categorized by reference to their primary activity.

Table 5.1 Employment categories for analysis of port-related employment.

	Operational	Port Linked	Port Based	Port Located
NATURE OF BUSINESS	Port Authority Pilots Towage Mooring Stevedoring Bunkering	Ship repair Container terminals Bulk operators Clearing & forwarding Agencies Hauliers	Marine related firms including engineers etc.	Firms located within the Port but with no direct association
M²	27 477.5	2 095 862	46 877.7	10 953.2
EMPLOYMENT	941	4 035	298	31

This survey shows that a total of 5 305 direct job opportunities are created in the Port of Cape Town. Of those job occupants, 2 382 are directly employed by Portnet. (This figure represents only permanent staff)

The survey does not include job creation in other industries, which are dependent on the port, but outside port boundaries. Such industries may include shipping agents and other import/export related activities, cargo owners, cruise operators, road hauliers, oil refineries etc.

The significance of the various importing and exporting industries on the creation of employment are dealt with in Chapter 3.

3. Closing remarks

The port's role as major creator of employment in a city or region should not be underestimated. Of the 1 156 000 formally employed citizens in the Western Cape 0,5% are employed within the Port. Should the rest of the job opportunities created as a result of the existence of a port be included, this figure would be substantially higher. Furthermore, it should be noted that because of the seasonality of the shipping industry, temporary employment should also be taken into account.

Chapter 6

6. Cargo handling in the Port of Cape Town

6.1 Introduction

As a comprehensive port authority, Portnet is responsible for most of the cargo handling in the Port of Cape Town.

Generally, cargo handling can be regarded as the “core” business of most full service ports. It is also in this context that ports make the most vital contribution to the economy of its region.

To evaluate the contribution of cargo handling to the economy, it may be of value to consider the transfer of cargo in a port as a vital link in the distribution network.

According to the International Association of Ports and Harbours, the port may be regarded as a transfer node in a transport network. The role of the port is to enable the efficient transfer of goods from one means of transport to another while enabling each to operate independently.

Roads, railroads and seaways physically meet at the port. As these infrastructural links do not by themselves have the ability to transport cargo, various types of vehicles and vessels are used to effect the movements. Those means of transportation are designed and operated to ensure efficient use. Because of differences in the flow of cargo and the characteristics of the various modes of transport, the vehicles and vessels have different capacities and types of operations.

Hence, to transfer goods between different means of transport, the port must not only provide connectivity and utility in terms of appropriate handling equipment

but also bridge the gap between the means of transport in terms of frequency, capacity and time. This requires the port to have the necessary infrastructure, equipment and storage facilities

To ensure efficient handling of cargo, a port should take into account the following:

- relative importance of different modes of transport
- characteristics of the vehicles and vessels using the port
- their capacity and their operating schemes including frequency
- type of cargo-carrying equipment used
- trade patterns
- distribution systems
- consignment size.

6.2 Types of cargo

The conditions for the transfer of cargo depend on whether the cargo is unitized or not. Unitization has a direct impact on terminal operations since cargo-carrying equipment, e.g. containers, facilitates handling and protects the cargo.

The Portnet Tariff Book describes the following types of cargo handled in the Port:

1. Containerized cargo, where a container is defined as “an article of transport conforming to ISO standard 668 latest edition for 1A, 1AA, 1C and 1CC containers,
2. Bulk cargo is defined as “ a homogeneous commodity in solid or liquid form, discharged/shipped by means of grabs, filled buckets, filled baskets and by any other mechanical means, onto/from vehicles, open spaces or other storage

areas in respect of solids and by means of connecting pipes direct into/from movable tankers for liquids.

3. Perishable cargo is described as “cargo subject to rapid deterioration e.g. fish, fruit, vegetables, plants, meat, dairy products, eggs and other cargo requiring refrigeration.”
4. Unitized/ palletized cargo, which is defined as follows:
“Cargo landed/shipped on pallets, in paraweb slings, in containers other than ISO containers, in cages, slip sheeted cargo and tote/bulk bags, (tote/bulk bags each in excess of 500 kg) as well as CKD traffic and cargo strapped to platforms”

6.3 Statistics : Port Activity

Table 6.1 Total tonnage handled

	1995	1996	1997
Containerised	3 721 493	2 967 998	3 227 104
Bulk	209 448	457 985	416 331
Breakbulk	3 250 665	2 822 086	3 391 449
Petroleum	3 875 981	2 828 056	5 593 980
Transshipment	587 804	533 949	435 225
TOTAL	11 644 491	9 610 074	13 064 090

Source: Portnet Statistics

Table 6.2 TEU' s Handled

	1995	1996	1997
Landed	153 560	160 427	158 509
Shipped	154 128	156 873	157 874
TOTAL	307 688	317 300	316 383

Source: Portnet Statistics

6.4 Value of cargo

Table 6.3 The value of cargo imported and exported through the Port of Cape Town

	1997
Containerized Imports	R 10,430,346,004
General cargo imports	R 14,975,418,722
Containerized exports	R 5,186,776,654
General cargo exports	R 1,668,876,935
TOTAL	R 32,261,418,315

Source: Portnet Statistics

6.5 Revenue earned by port community through the handling of cargo

Portnet cargo handling revenue

That revenue comprises the following:

- Terminal handling revenue, which includes income from normal cargo handling , crane hire, labour and storage
- Ad valorem wharfage income based on the value of cargo
- Cartage of cargo

Table 6.4 Cargo handling revenue earned by Portnet

1997	Rm
TOTAL	547.9

Revenue for the accommodation of cargo vessels

Generally known as marine charges, such revenue accounts for the following:

- Port and berth dues
- Pilotage
- Craft assistance
- Other sundry services

Table 6.5 Revenue for the accommodation of cargo vessels

1997	Rm
TOTAL	6.8

Note: This figure excludes all revenue associated with ancillary services as discussed in chapter 6

Revenue earned by privately owned terminals in the Port

That revenue comprises the income earned by the following terminals:

- Fruit terminal
- Bulk liquids facilities
- Facilities for the handling of fish

Table 6.6 Revenue earned by privately owned terminals in the port

1997	Rm
TOTAL	77.4

Revenue earned by stevedores

In South African ports, the handling of cargo on board a vessel is the responsibility of private stevedores. This includes lashing and unlashng of containers, opening of hatches and movement of cargo on board a vessel.

There are a number of stevedoring firms present in the port of Cape Town, of which four firms have permanent premises within the boundaries of the port. These firms contribute 807 employment opportunities to the total labour force within the Port of Cape Town. It is therefor important to evaluate their contribution to the income earned through the handling of cargo in the port.

Table 6.7 Revenue earned by stevedores

1997	Rm
Containerized cargo	3.9
Bulk cargo	2.1
General cargo	61.1
TOTAL	67.1

See Annexure C for calculation of revenue

Revenue earned by clearing and forwarding agents

Clearing and forwarding agents earn about 5% of the total disbursement for cargo handled. According to SAAFF (South African Association of freight Forwarders) the value of that business can be estimated at R 86.5 million.

Revenue earned by ships' agents

Table 6.8 Revenue earned by ship agents

1997	Rm
Containerized cargo	68.7
Liquid bulk	0.2
Petroleum	1.0
Bulk	0.4
General cargo	6.1
TOTAL	76.4

See Annexure C for calculation of revenue

6.6 Closing remarks

Table 6.9 Summarises the total income generated in the Port of Cape Town through the handling of cargo

Table 6.9 Revenue generated through the handling of cargo

1997	Rm
Portnet cargo handling revenue	547.9
Accommodation of vessels	6.8
Private terminals	77.4
Stevedores	67.1
Clearing & forwarding	86.5
Ships agents	76.4
TOTAL	862.1

From this it is evident that a significant amount of money is circulated in the regional economy as a direct result of the activities of the port.

Furthermore, the value of the cargo moving through the Port of Cape Town is a clear illustration of the importance of the existence of ports in the facilitation of international trade. However, the imbalance in trade as illustrated in the difference between the value of imports and exports and its impact on the balance of payments cannot be ignored as this represents a major outflow of foreign currency from the region.

Chapter 7

7. Port related industries

7.1 Introduction

There are a few industries, which co-exist with ports in most of the world. These industries fulfill an important and specific role in the economic viability of the port and the services they provide to port users ensure the smooth flow of international trade.

In the previous chapters, the importance of the efficient handling of cargo was emphasized. However, that will not be possible if vessels do not receive ancillary services on their visits to the Port.

7.2 The bunker industry

Bunkers are a by-product of the refining of crude oil. In the Port of Cape Town, bunkers are supplied by Joint Bunkering Services (JBS), a joint venture between the four oil majors in South Africa (Caltex Oil, Engen, BP, Shell).

Before 1973, each of these companies provided its own bunkering services. However, that proved to be inefficient because of the duplication of facilities, which increased the cost to the shipping lines and added to the transport cost of imported and exported goods. Since the co-operation agreement in the form of JBS, users enjoy the benefits of a more streamlined and cost-effective service.

In addition, South African ports are known for the provision of some of the world's cheapest bunkers and Cape Town supplies approximately 2% of the world's bunkers. Only Singapore, Rotterdam and Houston are able to compete significantly with South African bunker prices. This may be ascribed mainly to the

respective ports' proximity to petroleum refineries. The result of that fact, as well as the strategic location of South African ports, is that many ships call at these ports for bunkers only, without loading or discharging cargo. Table 7.1 illustrates the number of vessels calling for bunkers only.

Table 7.1 Bunkers only calls: Port of Cape Town

Year	Number of vessels	Port revenue (R)
1994	748	7 660 512
1995	628	7 836 262
1996	672	8 744 459
1997	843	13 753 467

Source: Portnet Statistics

Note: The reason that only vessels calling for the sole purpose of bunkering is included in this calculation, is to avoid the double counting of revenue as the revenue for other vessels is included in their respective sections.

Ships calling for the sole purpose of bunkering do not contribute to the economy in terms of loading or discharging cargo. The contribution of their business is limited to the purchase of bunker fuel only. Furthermore, these vessels usually stay in port for less than 18 hours and neither their crew nor the ship owner spend any monies in the city.

However, the value and volume of bunkers sold in the Port of Cape Town is of significant importance to the economy as illustrated in Table 7.2

Table 7.2 Bunkers provided in the Port of Cape Town

Year	Volume	Value (R)
1994	804 615 154	421 369 194
1995	834 327 792	467 480 090
1996	823 235 606	590 682 274
1997	1 037 232 518	774 443 162

Source: Joint Bunkering Services

Assumptions:

- 1). \$1 = R4, 61 (1997) (Source: ABSA Quarterly South African Economic Monitor, Second quarter 1999 (www.absa.co.za/monitor))
- 2) Bunker volumes: 55% Fuel oil 45% gas oil
- 3) Annexure D for calculation

Consequently the revenue earned in the Western Cape for the provision of bunkers comprises the revenue earned by the port for accommodating the ships and the value of bunkers sold by oil companies. That amounted to R 788 196 629 in 1997.

7.3 The Shiprepair Industry

The Port of Cape Town is strategically located to serve vessels in need of repairs. Portnet owns the infrastructure and numerous contractors and ship repairers do repairs, which contributes to the region's economy. Approximately 70% of the industry's earnings comprise foreign exchange.

The shiprepair industry contributes approximately 953 jobs to the creation of employment in the Port.

Table 7.3 Shiprepair activity in the Port of Cape Town

Year	Number of vessels	Vessel Sizes (GRT days)	Port revenue
1995	514	9 059 906	7 816 232
1996	460	5 661 732	9 333 133
1997	479	11 826 185	12 262 267

Source: Portnet Statistics

Other than direct spending on repairs, the shiprepair industry has more benefits to the regional economy. Not only is money spent on repairs but the following spending should be taken into account as well:

- crew spending while in port
- procurement of ships' stores
- spending by ship repair companies

1. Crew spending

In calculating the spending by crewmembers the following assumption must be made: (Source: Safmarine)

- average crew size per vessel: 22
- average wage bill per ship: R180 000 per month
- crew members spend approximately 10% of their wages away from home
- days in port: (1997)

Table 7.4 Calculation of the weighted average days in port

Repair facility	Number of ships	Average days in port	Weighted average
Sturrock dock	56	23.5	2.75
Robinson dock	73	10.7	1.63
Syncrolift	350	5.5	4.0
	479		8.38

Source: Portnet Statistics

Calculation:

Formula: = number of ships x average spending per day x 365 days per annum

Spending per day:

$$\begin{aligned}
 &= (10\% \times \text{average wage bill}) \times \text{days in port} \div 31 \text{ days per month} \\
 &= (10\% \times 180\,000) \times 8,38 \div 31 \\
 &= \text{R } 4\,866 \text{ per day}
 \end{aligned}$$

Therefore: 480 ships x 8.38 days
 = 4022.4 ship days per annum

= R 19 572 220 per annum

2. Procurement of ships' stores

According to shiprepair companies interviewed the average amount spent on ships stores amounts to R 1 million per ship. (Source: Globe Engineering). If 480 ships call for repairs, it can thus be estimated that the annual spending will amount to R 480 000 000

3. Spending by shiprepair companies

During the aforementioned interviews it was said that the average expenditure on services and other costs for shiprepair companies amounts to R 500 000 000 per annum. (Source: Globe Engineering)

If all the amounts mentioned above are summed, the total flow of money in the shiprepair industry can be summarised as follows:

Table 7.5 Contribution of the shiprepair industry to the economy.

1997	R
Portnet revenue	12 262 267
Repairers' revenue ⁽¹⁾	200 000 000
Crew spending	19 572 220
Procurement of ships stores	480 000 000
Spending by ship repair companies	500 000 000
TOTAL	1 221 834 487

(1) Source: Globe Engineering; Dorbyl Marine;

7.4 **Fishing industry**

As a direct result of the abovementioned port-related industries and the infrastructure provided, the Port of Cape Town has become the most important commercial fishing centre in South Africa. Furthermore, the port serves as an all-year logistical base for the Japanese, Chinese, Taiwanese and Russian fishing fleets operating in the southern Indian and Atlantic oceans.

The industry impact on the local economy is significant as it provides employment, million of Rands in export earnings and attracts thousand of visitors, including the crew of vessels, to the City centre.

Employment created by the fishing industry within the boundaries of the commercial port amounts to 501 jobs.

South African fishing fleets

Local fishing fleets are accommodated in the Victoria & Alfred Waterfront. As the scope of this study focussed on the commercial port only, the activities of these fleets will not be included.

However, Portnet, as the port authority of the commercial port receives some revenue from the accommodation of these fleets. That money includes licenses, conservancy charges and light dues for the use of entrance channels and navigational aids. It amounts to about R 388 701 per annum.

The number of fishing vessels which have called at the Port of Cape Town in 1995 to 1997 are shown in Table 7.6

Table 7.6 South African fishing vessels calling at the Port of Cape Town

	Number of vessels
1995	357
1996	311
1997	256

Source: Portnet Statistics

Foreign fishing fleets

The foreign fishing fleets, however, are accommodated in the commercial port. Table 7.7 lists the number of foreign fishing vessels calling at the Port

Table 7.7 Foreign fishing vessels calling at the Port of Cape Town

	Number of vessels
1995	822
1996	953
1997	942

Source: Portnet Statistics

To evaluate the contribution of that business to the economy, the following elements need to be considered.

- Portnet revenue – that includes only revenue earned for the accommodation of vessels. Cargo handling revenue was included in the total cargo handling revenue of the port as discussed in chapter 6.
- Spending of crew
- Procurement of ship stores
- Procurement of bunkers, which was included under section 7.2
- Shiprepair, which was included under section 7.3

Crew spending

To calculate the spending by crew members, the following assumption was made:
(Source: Beiramar Shipping Services)

- average crew size: 30
- average monthly wage per crew member: R 6 000
- spending away from home: 10%

Table 7.8 Contribution of the foreign fishing fleets to the Port of Cape Town

1997	R
Portnet revenue ⁽¹⁾	62 940 026
Crew spending	16 956 000
Procurement of ships' stores ⁽²⁾	27 000 000
TOTAL	106 896 026

(1) Source: Portnet statistics

(2) Source: Beiramar Shipping Services

The total contribution of the fishing industry can be estimated at R 107 284 727 per annum

7.5 Cruise Tourism

Tourism is considered to be one of the major contributors to future economic growth in the Western Cape. Currently it contributes 8.4% to the labour force of

the region and 8,95% to the gross regional product. (Wesgro, 1997) According to Captour, the value of tourism in the region is estimated at R2, 9 billion per annum. (Port of Cape Town handbook & Directory 1997/98)

The Western Cape attracts more than half of the country's foreign visitors of which 7058 enter the country via the Port of Cape Town.

This analysis of the contribution of the port to the regional economy will thus not be complete without considering the impact of this important market segment.

Table 7.9 List the number of cruise vessels and passengers which have entered the Port of Cape Town during 1996 and 1997.

Table 7.9 Cruise vessel activity in the Port of Cape Town

Year	Number of calls	Number of passengers
1996	17	3 971
1997	18	7 058

Cruise tourism's contribution to the regional economy can be estimated if the following is considered:

- Portnet's revenue
- Revenue of tour operators; transport operators and taxis
- Procurement of supplies
- Spending by passengers

Table 7.10 Contribution of the cruise tourism industry to the economy.

1997	R
Portnet revenue ⁽¹⁾	490 266
Tour Operators' revenue ⁽²⁾	2 842 500
Passenger spending ⁽³⁾	10 587 000
Procurement of ships stores ⁽⁴⁾	1 000 000
TOTAL	14 919 766

(1) Source: Portnet Statistics

(2) Annexure E

(3) Assumptions

- Passengers spend on average R1 500 per day (Janse van Rensburg, 1997)
- Average stay in port is one day

(4) Source: Abukrombe & Kent

7.6 Closing remarks

Although the abovementioned activities fall outside the so called “core” business of the port, significant value is added to the competitiveness and economic viability of the port.

Firstly, the availability of ancillary services improves a port's potential as a hub port for transshipment cargo. Furthermore, the existence of ancillary services increase shipping and trading opportunities for a regional economy.

To quantify these benefits will require further in depth analysis and sensitivity testing. For the purpose of this study, however, it is concluded that the contribution of port related industries' to the Western Cape Economy is illustrated in the 1 506 employment opportunities created and the R 2 131 million spent in the region.

Chapter 8

8. Conclusion

Ports link economies to each other through shipping. This study confirms the notion that ports are gateways to the economic development and growth of a country or, in this case, region.

The impact of the port community's activities on various sectors is evident. Within and around the port many industries are established and the efficient development of the port and its smooth operation impacts on all of these industries.

South Africa, and for the purpose of this study, the Western Cape, finds itself in a relative "open" economy. This necessitates a substantial influx of foreign exchange in the form of both export earnings and foreign investment that will not happen and employment that will not be created unless the region's ports develop in such a way that international trade is stimulated and an investment friendly environment is created

The relatively healthy economy in the Western Cape is the ideal environment for an export-orientated economy. The region's agricultural based industries have already proven that to be of great potential.

This export orientation is seen as the pre-requisite for future economic growth in line with both national and provincial governments' objectives of growth and redistribution.

Cost-effective and efficient cargo handling services contributed substantially to the international competitiveness of local export products. The development of the Western Cape's fruit industry is surely one of the best examples of this statement.

The Port of Cape Town as full service port has the potential to serve most of the needs of the Western Cape economy. The port provides a variety of facilities and services which contribute to its competitiveness as major port on the North-South sea-route. Furthermore, the port has shown a sustainable growth over the past few years and is expected to continue that trend.

It serves a geographically large hinterland and which extends over the boundaries of the Western Cape region. The result of that extended hinterland is an influx of money into the region, increasing the circulation of income.

The following table summarizes the impact of the activities in the Port of Cape Town on the creation of employment and the circulation of income in the region:

Table 8.1 Summary of the impact of the activities in the Port of Cape Town on the creation of employment and the circulation of income in the Western Cape

Activity	Employment	Revenue Rmillion	Impact of multiplier effect R million ⁽¹⁾
Cargo handling	4 293	862.1	1 957.0
Bunkering	52	788.2	1 789.2
Ship Repair	953	1 221.8	2 773.5
Fishing industry	501	107.2	243.3
Cruise tourism	-	14.9	33.8
TOTAL	5799	2 994.2	6 797.0

1. Assuming that the multiplier for port labour applies

To conclude, this study serves as evidence of the significant contribution of the Port of Cape Town to the development and growth of the Western Cape economy. Indeed, **trans-port is civilization!**

Bibliography

1. Boshoff, F. *Die Vermenigvuldiger vir Butterworth en Umtata*. Pretoria. Raad vir Geesteswetenskaplike Navorsing.
2. Bown, A.H.J. *Port Economics*. Second edition. Foxlow Publications Limited. 1967.
3. Die Burger, 1998. *Investerings, groei 'lotsbepalend vir Wes-Kaap'*.
4. *General Conditions and Scale of Minimum Agency Charges Applicable at the Ports in South Africa and Namibia*. Association of Ships' Agents & Brokers of Southern Africa. 1996
5. Goldberger, A.S. *Impact Multipliers and Dynamic Properties of the Klein Goldberger Model*. North Holland Publishing Company. Amsterdam. 1959. p78-83
6. IAPH. *The Future Role of Ports in Combined Transport and Distribution Centres*. IAHP Combined Transport and Distribution Committee. Tokyo
7. Internet website: cba.ua.edu/~cber/. *UA Centre for Business and Economic Research*.
8. Internet website: moneymaker.com. *The Monetary System's 'Multiplier Effect.' Explained in Layman's Terms*.
9. Internet website: www.absa.co.za/monitor. *ABSA Quarterly South African Economic Monitor, Second quarter 1999*.
10. Janse van Rensburg, I. *The economic significance of the port of Cape Town*. Stellenbosch. 1997
11. Keynes, J.M. *The General Theory of Employment, Interest and Money*. New York. Harcourt. Brace. 1936. p155
12. Le Roux, C.A. *An Input – Output Analysis of the Manufacturing Industry in Development Planning Region 6*. Port Elizabeth. 1991.
13. Machlup, F. *International trade and the national Income Multiplier*. University of Buffalo, Philadelphia. 1942. p9.
14. North. D.C. 1961. *The economic growth of the United States 1790 – 1860*. Englewood Cliffs, New Jersey: Prentice-Hall.
15. Owen, W. 1964. *Strategy for Mobility*.
16. Pidea plc. October 1994. *The Economic Impact of the port of Southampton in the City Region*. Southampton City Council, Hampshire County Council.

17. *Portnet Tariff Book*
18. Portnet, 1993. *The Port of Cape Town Training Module*
19. Portnet, 1998. *Port of Cape Town handbook & Directory*.
20. Portnet, 1998. Unpublished data.
21. Richardson, H.W. 1973. *Elements of regional economics*. Harmondsworth, Middlesex: Penguin.
22. Takel, R.E. *Planning Land Use in Port Areas: Getting the most out of Port Infrastructure*. Unctad 1983
23. Unctad. 1977, *Appraisal of port investments, Report by the Unctad secretariat*.
24. Vermaak, J.A. *Die Vermenigvuldigereffek van Werkgeleentheidskepping vir die Inwoners van Temba*. Pretoria. 1976. p3-5.
25. Viljoen, R.P. *Aspekte van Regionale Analise en Beplanning met Spesiale Verwysing na die Suid Afrikaanse Ervaring*. Pretoria. 1977
26. Wesgro, 1998. *Annual Review*.
27. Wesgro, 1998. *The Western Cape Economic Monitor, prospect for 1998 and beyond*.
28. Wesgro, April 1998. *The Western Cape Economy on the way towards Global Competitiveness with Social Stability*.
29. Winkelmanns, W. *Ports and Nodal Points in a Global Transport System*. Antwerp. 1991.

Annexure A

List of respondents

1. Duncan Dock Cold Store
2. International Harbour Services
3. Cross Berth Cold Store
4. Beiramar Shipping Services
5. Globe Engineering
6. Cape Town Bulk Storage
7. Joint Bunkering Services

Annexure B

Calculation of multiplier with Portnet profits included

The purpose of this calculation is to show the effect of the inclusion of the profits earned by the port into the calculation of the multiplier effect.

The calculation is based on the 1997/98 financial year.

For simplification the following formula, was used:

$$\frac{1}{1 - (\text{MPC} - \text{MPI})}$$

Where: MPC = Marginal propensity to consume

MPI = marginal propensity to import

1. Marginal propensity to consume

To calculate this figure it was necessary to determine the percentage of an employee's salary or wage, which was not spent. To obtain this rate of domestic savings as published was taken into consideration as well as the average personal tax rate.

Therefor MPC can be calculated as follows:

$$100 - ((\text{Personal savings} + \text{personal taxes paid}) \div (\text{total labour cost} + \text{profits}) \times 100))$$

$$\begin{aligned} \rightarrow \quad \text{Personal savings} &= \text{labour cost} \times 4\% \\ \rightarrow \quad &176\,610\,893 \times 4\% \\ &= 7\,064\,435.72 \end{aligned}$$

$$\begin{aligned}
 &\rightarrow \text{Personal taxes} = \text{labour cost} \times 30\% \\
 &\rightarrow 176\,610\,893 \times 30\% \\
 &= 60\,047\,703.62 \\
 &\rightarrow 100 - \left(\frac{7\,064\,435.72 + 60\,047\,703.62}{176\,610\,893 + 258\,527\,580} \right) \times 100 \\
 &= 100 - 15.42 \\
 &= 84.58\%
 \end{aligned}$$

Thus MPC = 84.58% i.e. 84.58% of income earned in the Port is spent

2. Marginal propensity to import

This figure represents the percentage of spending which occur outside the boundaries of the Western Cape.

According to records this percentage is estimated at 10%

Therefore, the MPI = 10%

3. Calculation of Multiplier effect

$$\begin{aligned}
 &\frac{1}{1 - (\text{MPC} - \text{MPI})} \\
 &\rightarrow \frac{1}{1 - (0.8458 - 0.1)} \\
 &\rightarrow \underline{\underline{3.93}}
 \end{aligned}$$

Annexure C

Cargo handling revenue

1. SHIPS AGENTS

TYPE OF CARGO	PARCEL SIZE	TARIFF	VOLUME OF CARGO	NUMBER OF VESSELS	REVENUE (1996 REVENUE 1997	
	C = A/B	R	A	B	D = B x RATE	
Containers (rate/TEU)		200	316,383		63,276,600	68,718,388
Liquid bulk	3,000	7,630	60,000	20	152,600	165,724
Petroleum	57,081	9,525	5,593,980	98	933,450	1,013,727
Bulk	14,847	14,635	356,331	24	351,240	381,447
General cargo	4,966	8,205	3,391,449	683	5,604,015	6,085,960
TOTAL					70,317,905	76,365,245

Notes:

Tariffs as per General Conditions and scale of Minimum Agency Charges, ASABOSA, 1996

Inflation 1997: 8,6% (Source: www.absa.co.za/monitor)

Cargo volumes and number of vessel as per Portnet Statistics

1. STEVEDORES

TYPE OF CARGO	VOLUME	TARIFF	REVENUE
Containers (TEU's)	316,383	12.50	3,954,788
Bulk	416,331	5.00	2,081,655
General cargo	3,391,449	18.00	61,046,082
TOTAL	4,124,163		67,082,525

Annexure D

Bunker value

Year	volume (l)	Fuel oil (l)	Gas Oil (l)	Fuel oil (t)	Gas oil	\$/t	\$/t	value \$	value \$	value \$	R/\$	value (R)
		55%	45%	1000 l = 1t	850 l = 1t	Fuel Oil	Gas oil	Fuel Oil	Gas oil	Total		Total
1994	804,615,154	442,538,335	362,076,819	442,538	425,973	100	183	44,253,833	77,953,009	122,206,843	3.45	421,369,194
1995	834,327,792	458,880,286	375,447,506	458,880	441,703	98	184	44,970,268	81,273,343	126,243,611	3.70	467,480,090
1996	823,235,606	452,779,583	370,456,023	452,780	435,831	110	211	49,805,754	91,960,260	141,766,014	4.17	590,682,274
1997	1,037,232,518	570,477,885	466,754,633	570,478	549,123	101	201	57,618,266	110,373,743	167,992,009	4.61	774,443,162

Annexure E**Revenue earned by Tour Operators**

Source : Abukrombe & Kent

WORLD CRUISES (A&K)

Taxis			500
Busses	20 per ship	2500	50000
Tours	Guide		400
	Entrance	R20/ person	12600
Refreshments	R150/person		94500
Operators mark up			31500
			189500 per ship

Assumption: average 1 day stay
 full day tours
 630 passengers per vessel

Number of ships 15

Total income 2,842,500.00

Annexure F**Calculation of value of clearing & forwarding business for 1997**

	Rm
Wharfage revenue	293.5
Customs charges	767
Terminal handling	252.6
Freight	406.3
	1719.4
Marine Insurance	10.3
Total disbursement	1,729.7
Clearing & forwarding income	86.5