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Administered Prices Study on Economic Inputs

Ports Sector

08 August 2007

FINAL REPORT

Abbreviations

20’	20 foot/ 6meter container
40’	40 foot/ 12meter container
CPIX	Consumer Price Index excluding interest rates on mortgage bonds
DCT	Durban Container Terminal
FOB	Free on Board
FRIDGE	Fund for Research into Industrial Development, Growth and Equity
GT	Gross tonnage
HS	Harmonised System of trade classification
ISPS	International Standards for Port Security
LSCI	Liner Shipping Connectivity Index
MSA	Moving South Africa
NEDLAC	National Economic Development and Labour Council
NFLS	National Freight Logistics Strategy
NPA	National Port Authority
SAMSA	South African Maritime Safety Association
SAPO	South African Port Operations
SARS	South African Revenue Services
SOE	State Owned Enterprise
t/ph	Tons per hour
TEU	Twenty foot Equivalent Unit, the unit for container volumes
THC	Terminal Handling Charge
UNCTAD	United Nations Conference on Trade and Development
VTS	Vessel Traffic Services

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Executive Summary

Improvements to the competitiveness of commercial transport systems in South Africa will significantly boost economic and employment growth, (see Davies and van Seventer, 2006). The performance of the transport sector directly feeds through to the rest of the economy due to the high concentration of economic activity on the inland plateau, the freight cost sensitivity of foreign trade and the distance to market of South Africa's major trading partners. Transport is a sector that is shaped to a considerable extent by government with respect to both policy and in those operations performed by State Owned Enterprises. This report examines administered prices in the ports sector. It benchmarks the competitiveness of the ports and reviews the approach to setting prices to assess their the alignment to achieving the socio-economic goals as laid out in Asgisa. In the study of ports the focus is on the port infrastructure and services services provided by the National Ports Authority and port operations provided by South African Port Operations, both divisions of Transnet (Pty) Ltd.

A port is the interface between sea and land transport systems that forms an essential link in the services chain between producer and final user. Total logistics costs in South Africa are high, representing some 15.2% of GDP. Port costs make up some 13% of transport costs along the value chain. Port services are a small but important part of costs of moving freight. Crucially the performance of ports regarding prices, reliability and speed of cargo handling can be materially influenced to improve their cost effectiveness. This underpins the rationale for this study, that is to examine factors that can assist in lowering the costs of doing business.

The scope of the study involves an examination of the National Port Authority light dues, vessel traffic service, pilotage, marine services, port charges (port dues and berth dues) and cargo dues. Port operations rendered by SAPO in container, bulk, break-bulk and car terminals have been studied. Attention was given to container services, car terminals and bulk cargo.

Data gathering was frustrated by the refusal by Transnet to cooperate as the enterprise was preparing for imminent regulation in the ports and pipeline sectors. Consequently the methodology was adapted and information was gathered from users where possible, however the study was limited as a result. First, collection of quantitative pricing and performance indicators for South African ports services and operations has been constrained. Secondly, company officers were not consulted on pricing methods and mandates informing their practices. Thirdly comprehensive benchmarking of services and performance levels was not possible. Fourthly, company officers were neither consulted nor able to alert the consultants to erroneous conclusions drawn in the absence of evidence from the Transnet group.

In principle pricing for port calls and services within ports should be proportional to the costs of a ship making the call that covers the four principle cost items, namely time spent in port, general marine and land infrastructure (not attributable to a single user) use of a berth (attributable to a user) and the costs of handling the goods. Price setting should be based on long run marginal costs. Practice in South Africa violates this principle. This report shows that pricing practices in South Africa are strategic with their defining characteristic being the inclusion of non-port financing objectives in the setting of port pricing.

South African port prices are affected by the nature of the country's marine trade with limited scale economies and multiple port calls which serve to increase port costs.

Port pricing is influenced by the history of ports development over time. In South Africa port pricing is profoundly affected by the institutional arrangement that grouped ports and rail into a single administrative entity. The pricing power South Africa port authorities have on inelastic demand for port services established the practice of raising wharfage charges on cargo to fund non-port activities. This practice has continued into the current era in the form of Cargo dues. Cargo dues constitute some 70% of the income to the port authority.

The body of the report examines in detail the pricing levels for marine services, port and marine infrastructure, container operations, break bulk and bulk operations. It finds that over the period of 2000 to 2007 the following main changes in the level and rates of increase in prices occurred:

1. Tariff reform reduced the level of charges collected via wharfage when converted to cargo dues.
2. Marine services prices were increased significantly to make the more cost reflective.
3. Cargo handling charges from SAPO increased significantly during the 2001 to 2003 period to raise margins on that category of port charges that historically had been kept low.
4. Transnet has followed a price adjustment programme set by compact with the Government. Price increases have since 2005 been set at rates which converge with the CPIX.

Port users summing up the aggregate changes in South African port costs over a decade believe that South Africa has moved up the cost curve from the second quartile into the third quartile from the bottom in terms of total costs.

Performance measurements show South African port operations are operating at levels below those achieved on equivalent facilities elsewhere. The conclusions drawn from the performance assessment of container terminal crane moves, albeit not a full benchmarking study, suggest that productivity is not constrained by equipment shortages. Instead workflow is uneven (possibly due to deficiencies in on-quay transport) and there are defects in operations planning. These results, however, do suggest there are grounds for optimism since these deficiencies can be overcome by business improvement strategies. Transnet is engaged in a turn-around strategy.

Comparison made with Australia, Brazil and European ports indicates that South African administered prices for port services and operations places South Africa in the middle of a range of comparator countries with respect to port call costs for vessels and terminal handling charges on cargo. Including the dues paid on cargo to give the total waterfront costs places South Africa first as the most costly port on a per TEU basis in the pool of comparator ports.

South African port authorities practice a form of pricing determined by factors external to the operating costs and financing requirements of ports. The pricing principles underlying the largest component of port charges are revenue targets set by the holding entity Transnet. Data gathered in this study confirms earlier studies that arrived at these conclusions. The pricing principles are classified as strategic pricing. Strategic port pricing is opaque, distortionary, harmful to trade, contrary to the stated objectives of broader transport and specifically ports policy. It is recommended that strategic port pricing should be phased out completely.

This study indicates how the institutional framework of the state owned transport system that determines port prices is almost impervious to change in spite of explicit

tariff reform between 2001 and 2003 designed to balance over and under recovery on the pricing of a range of port services.

Waterfront performance plays a small role in national welfare, however, administered prices in ports and performance are subject to influence. The establishment of a port regulator will be a significant step in the institutional arrangements for South African ports Port users are understandably expectant that the port regulator will improve pricing efficiency within South African ports. However, the basic structure of the market will remain unaltered. Moreover the control of the port authority and a substantial share of the port operations activity by Transnet, a freight transport company, implacably negates the market structure principles of a landlord port architecture.

Ports that are leaders in pricing and performance measures around the world are located in regions characterised by a high degree of port competition. The implications for administered pricing in South African ports is the critical requirement for practical intra and inter port competition to be encouraged.

Limited access to information was a major problem for this study. The response of industry participants to divulging information are symptoms of low trust and frustration between the players in the port system. Such conditions create major challenges for the Ports Regulator and for the success of efficiency improvement efforts by any stakeholders. It is recommended that price and performance indicators be collected and made public by the Department of Transport for the purposes of establishing an information basis for monitoring the South African waterfront.

1. Introduction

Administered prices are defined as prices set for goods and services provided by entities owned by the Government of South Africa. Given the dominant role played by Sate Owned Enterprises in the provision of power, transport and telecommunications services as inputs into final goods for domestic or export consumption, attention has been directed to administered prices in at least two respects. First, administered prices have been scrutinized for consistency with government economic policy and inflation targeting in particular. Secondly, administered prices have identified in a normative sense with the objective of "lowering the cost of business" in respect of which the President has said "...the government will also lead the process of ensuring that administered prices do not unnecessarily add to the general costs of production and the inflationary pressures in our economy" (Mbeki, 2004).

This report examines administered prices in port services and port operations. The scope of the services discussed is elaborated upon in section 1.3. A companion report examines administered prices in the freight rail sector.

Transport services matter in South Africa given the high concentration of economic activity on the inland plateau, the freight cost sensitivity of foreign trade and the distance to market of South Africa's major trading partners. Succinctly put, South Africa contributes less than 0.5% of global GDP, carries 0.5% of global logistics cost and requires 4.4 times the ton kilometres for each value unit of production moved compared to the rest of the world (CSIR, 2005:9). Transport service pricing and performance is worthy of intense scrutiny due to the commanding position of SOE Transnet (Pty) Ltd holding divisions providing rail (Spoornet), pipelines (Petronet), port services (National Ports Authority) and port operations (South African Port Operations). Transport services, or more broadly the cost, efficiency and capacity of the national logistics system (ASGISA, 2006), are identified as one of the binding constraints to growth in government's economic development programme. This report will show South Africa is disadvantaged by waterfront costs and relative performance with comparator countries.

1.1. Significance of port costs for the national economy

A port is the interface between sea and land transport systems that forms an essential link in the services chain between producer and final user. Delivery and title to goods may pass as goods move across the quay; nevertheless, the essential character of a port is that it acts as a gateway through which goods and passengers are transferred between shore and ship.

Ports form part of a chain thus stripping out their costs is a device to examine a component of South African logistics, however, it is the cost and efficiency of the whole logistics chain that is relevant for measuring and assessing competitiveness. Ports on their own make up one seventh of the average costs across the entire logistics chain.

Measures for South African port costs alone do not exist, fortunately the storage and ports component of total logistics costs have been estimated in CSIR, 2005. Production and imports for 2004 required the movement of 830 million tones, (segmented as mining 49%, manufacturing 45% and agriculture 6%). Storage and

ports contributed R34.3bn (16.4%), inventory and carrying costs R2.5 (1.2%), management administration and profit R42.3bn (20.2) and transport R130bn (62.2%) giving a combined total logistics cost of R209bn representing 15.2% of GDP (CSIR, 2005:14-16). The share of port and storage costs in total logistics costs for primary and secondary industry are markedly dissimilar, three times greater for the primary sector high volume low unit value cargo.

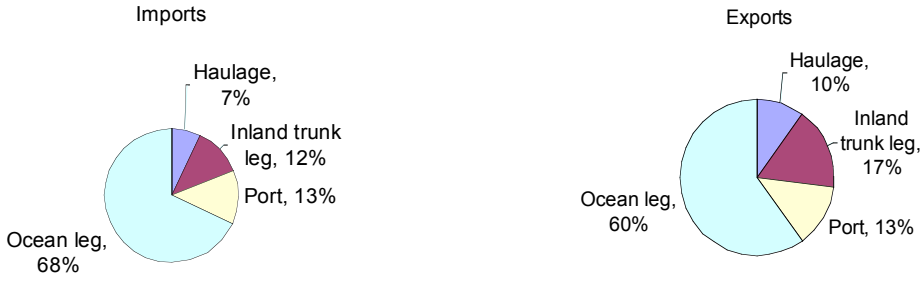
Table 1 – South African logistics cost elements: primary and secondary sectors 2004 (R billion)

	Primary sector	Secondary sector	Total logistics 2004
Storage and ports % element	30.5	11.9	16.4
Transport % element	47.7	66.7	62.2
Logistics cost (Rbn)	36.7	172.4	209
Logistics % of GDP	2.7	12.5	15.2

Source (CSIR, 2005:14-16)

Earlier analysis of the distribution of transport costs along the value chain undertaken by the Moving South Africa project, 1998 estimated port costs to 13% for both imports and exports.

Figure 1 – Distribution of transport costs along the value chain, 1998



Source: MSA, 1999:101

Directly comparable figures are not available. A breakdown of total transport costs for imported containerised cargo for 1997, which matches the MSA method, calculated waterfront charges to 13%, land-side charges 21% and the ocean leg 66%.

Australian waterfront charges excluding storage costs as a share of export prices for 1994-1995 amounted to 4.3% for primary exports and 3.8% for manufactured exports (Productivity Commission, 1988:14-15).

The evidence presented above paints a picture of ports costs comprising a significant share of transport costs. While this fails to provide a single composite measure of South African port costs it does provide a good indication of ports making a material contribution to transport costs.

1.2. Past assessment of South African port costs

South African transport costs have been scrutinised in a number of studies of trade performance including the Reynders Commission, 1972, Pretorius 1997, Naudé 1999

which have identified the major role played by transport system efficiency in affecting trade competitiveness. These studies have variously identified high transport costs and the ports component thereof as retarding the development of South Africa's trade performance.

Moving South Africa used a combination of user surveys and analysis to assess ports. It recorded user dissatisfaction with port costs and service quality (MSA, 1999).

Several studies have attempted to assess port and transport pricing by means of constructing logistics costs models. Botes, 2005 found that South Africa did not exhibit an international price gap on ocean bulk but found a 21% price wedge in the case of ocean container transport and concluded "Port policy… impacts directly on prices due to high tariffs and long turnaround time of vessels…" (Botes, 2005:14). Modelling of putative cost reductions realised through a port and rail reform scenario generated a 0.2% to 0.36% addition to GDP per annum (Venter, and Goode, 2004). Other recent work to investigated the economy wide impacts of price reducing reforms in infrastructure have produced less conclusive results. Davies and Van Seventer, 2006 identify problems due the current lack of information and "concur with the view of Van Seventer *et al* (2005) that mark-ups in rail transport and ports remain unclear" (Davies and Van Seventer, 2006:5).

In September 2005 the National Freight Logistics Strategy was released by the Department of Transport. The strategy examined specific modes and inter-modal issues. In the ports sector for the period 2004 and 2005 it drew attention to poor productivity observing that the Durban container terminal achieved 17 crane moves per hour against an international norm of 35 per hour. It noted poor service were mainly due to high port congestion arising from problems creating a classic vicious circle of congestion exacerbating poor productivity120. Referring to problems in the freight logistics system it noted "the main caused of inefficiency and poor service reliability are an aged asset base, low accountability for operational efficiency and a poor service culture, which are again strongly evident in ports and rail" (NFLS, 2005:12). The strategy states that the overarching issue facing the port sector relates to industry structure and regulatory framework. "The lack of an appropriate regulatory framework for the ports sector has allowed significant value to be stripped out of the sector to fund non-performing entities in other elements of the transport sector… (T)he lack of appropriate institutional arrangements to regulate and mange the system has resulted in low levels of efficiency and high pricing" (NFLS, 2005:24).

1.3. Scope of study

The scope of this study is confined to port service activities within South Africa's eight commercial ports administered by the NPA, namely Richards Bay, Durban, East London, Ngqura, Port Elizabeth, Mossel Bay, Cape Town and Saldanha Bay. Port Nolloth has been omitted, as it does not handle freight. Inland container terminals operated by Transnet's Spoornet division qualify as dry ports in respect of shipping, clearing and forwarding of containers, however, these do not form part of they study.

Prices that have been examined are those of the National Port Authority light dues, vessel traffic service, pilotage, marine services, port charges (port dues and berth dues) and cargo dues. In order to keep the focus on charges related to shipping and landing freight, NPA conservancy charges for small craft, passengers and their baggage, fire, water, and refuse removal has been omitted. Use of port authority ship repair facilities are not included, nor is the hire of equipment that may be used for cargo handling. Coastwise cargo makes up a very small share of South African maritime traffic and for this reason coastwise port charges (which are lower than deep sea rates) are not included in this study. It is noted that water and refuse removal has been indirectly

covered in the aggregate port call costs collected from industry consultations. All prices are obtained from the port tariffs schedule issued by the NPA.

Port operations rendered by SAPO in container, bulk, break-bulk and car terminals have been studied. Attention was given to container services, car terminals and bulk cargo.

1.4. Data collection and study limitations

Access to information on administered prices was formally requested by Nedlac to enable the consultants to conduct the study. In recognition of commercial interests of the NPA, SAPO, freight handling companies, shipping lines and other parties involved in the port services and operations market the consultants undertook to keep confidential the identity of parties consulted and aggregate or index price data collected that was deemed to be commercially confidential.

Several rounds of formal engagement with Transnet by Nedlac and by Government representatives on the Trade and Industry Chamber were held to secure cooperation of the holding company and access to its marine division. Transnet declined to co-operate on the grounds that the company was preparing for imminent regulation in the ports and pipeline sectors.

In consequence of the denial of access to Transnet, NPA and SAPO for this study of administered prices modifications were made to the methods employed. The consultants were reliant on pricing information in the public domain which mainly pertained to the NPA. Information was gathered from users where possible, however the study was limited in four material respects.

1. The gathering and presentation of quantitative pricing and performance indicators for South African ports services and operations has been constrained. Systematic data gathering is the responsibility of the NPA and SAPO and point data gathered from users is necessarily limited.
2. Company officers were not consulted on pricing methods and mandates informing their practices for arriving at list prices or contract prices with their customers. Therefore the conclusions arrived at are based on consultations with customers and deductions made there from.
3. Comprehensive benchmarking of services and performance levels was not possible. Typically benchmarking is conducted on a reciprocal basis between participants. Further, benchmarking requires at least some design and definitional clarification to standardise practices and measurement across different ports.
4. Company officers were neither consulted nor able to alert the consultants to errors or incorrect conclusions drawn on the basis of the available and limited data.

Prices for services have been obtained from the published port tariffs of Portnet and its successors NPA and SAPO. The findings presented in this report are based on the published tariffs that have been supplemented with price information gathered through industry consultations.

Reliance on published tariffs is a poor second to analysis of the actual prices charged and increases the possibility of arriving at erroneous conclusions. The analysis has been as rigorous as possible with the data limitations and interpretive errors corrected where possible. In practice this remains unsatisfactory on several grounds. First, annual price adjustments that are published in the tariff book are not applied to all customers which is evidently what occurred with the 1 April 2007 tariff adjustments

which are discussed in section 8.3.1. Secondly, rate adjustments to suit a cargo type or circumstances at a port cannot be captured with this method.

Information sources are referenced throughout this report, however, the identity of industry sources consulted during the course of this study has been withheld from the list of sources by the express request of those involved.

2. Port pricing

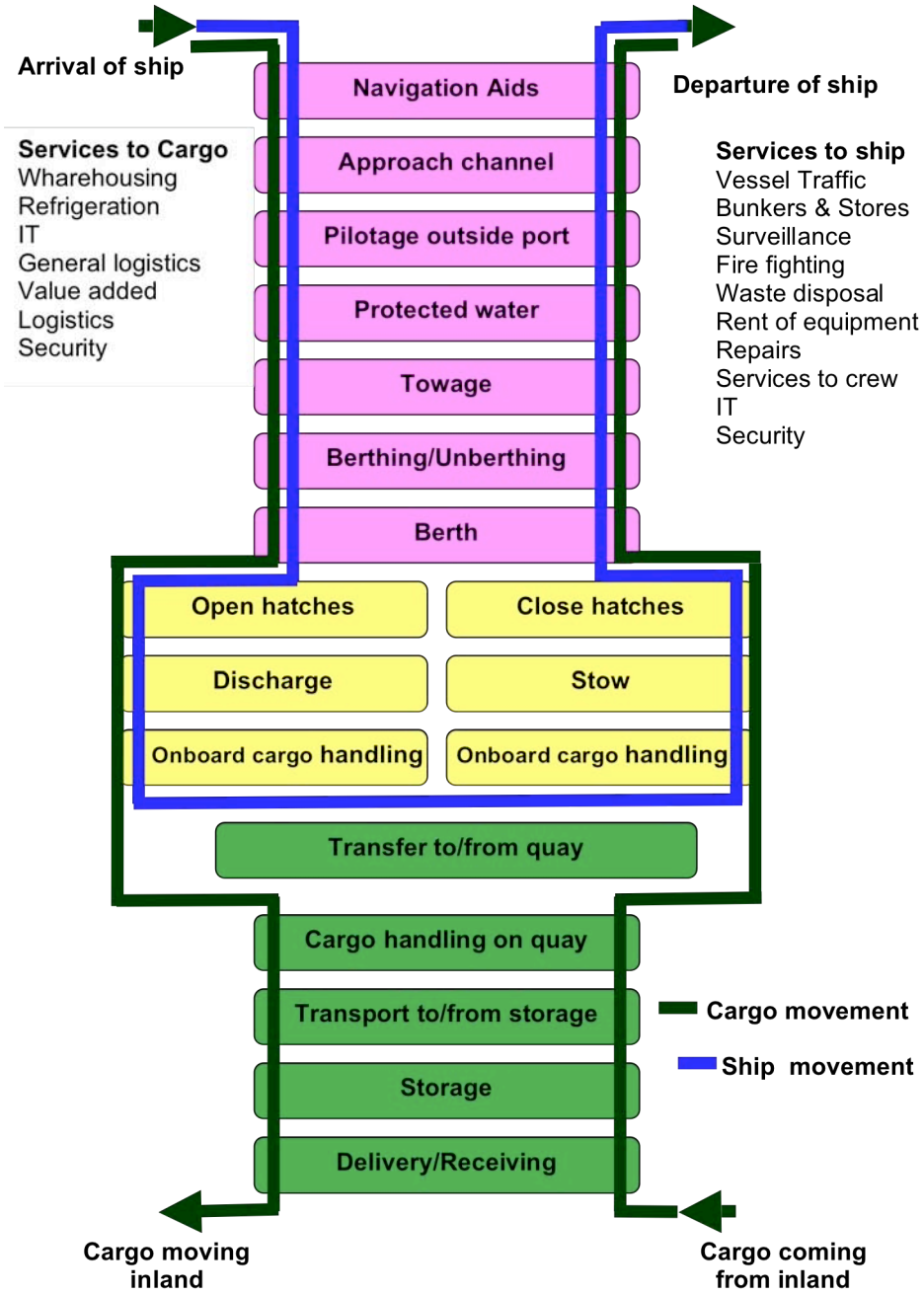
In principle pricing for port calls and services within ports should be proportional to the costs of a ship making the call that covers the four principle cost items, namely time spent in port, general marine and land infrastructure (not attributable to a single user) use of a berth (attributable to a user) and the costs of handling the goods. Price setting should be based on long run marginal costs. Practice in South Africa violates this principle. This report shows that pricing practices in South Africa are strategic with their defining characteristic being the inclusion of non-port financing objectives in the setting of port dues, elaborated upon in section 3.7.

2.1. What is a port?

Ports serving as gateways for goods is an intuitive and fair but limited definition of the port product. The movement of ships and cargo through a port consists of inter-related processes captured in Figure 2. Over time these processes have changed due to technology, scale and speed of handling. In particular port management practices have changed, competition between ports and the role that ports play as links in global supply chains has laid stress on port efficiency first and foremost and pricing secondly. The capital intensity of ports has risen along with the rising capital intensity of the world shipping fleet with an emphasis, most pronounced in the container trades of rapid and predicable ship turn around times.

Competition between ports has increased which has encouraged port management to invest in capacity and performance improvements, particularly of superstructures and improve work practices. In practice it is not ports that compete as much as the goods they handle in competing logistics chains. In this light greater attention is being paid to the interface between the port and its hinterland transport modes. Overall ports are physical market places that bring together a wide range of different market players whose interests coincide and conflict. The different interests of users spill over into contending views of the objectives and form of port prices.

Figure 2 – Schematic representation of the processes and services to ships and cargo moving through a port



Source: UNCTAD 1975 with modifications

2.2. Port pricing

In recognition of the heterogeneous character of interested and affected parties in the port system it is possible to list a number of objectives for the principle players and see that these objectives diverge on points. Price setting is the prerogative of the port authority, service providers and government but these differences do set the terrain for conflict.

Table 2 – Possible pricing objective of key port interest groups

Port player	Possible objectives
Government	Efficient management of assets
Economists	Minimising the welfare losses
Port authorities	Maximising throughput Maximising value add Maximising employment
Terminal operators	Return on assets
Users	Transparency of charges Prices should reflect the costs of the services

Source: adapted from Meersman et al., 2002

Academic enquiry into port pricing has developed a small body of literature that tries to make sense of these differences using methods to identify and properly allocate costs and critiques deviations from these principles. Useful to this study of administered prices is the classification by Petteren-Strandenes and Marlow (2000, p. 4), who divides the pricing principles applied in the port literature into five categories:

1. Cost-based pricing;
2. Methods for cost recovery;
3. Congestion pricing;
4. Strategic port pricing; and
5. Commercial port pricing practices in privatised ports.

Greater scrutiny of restrictions on competition in ports, captive markets, overt or covert subsidies and public funding of ports has prompted productivity and competition authorities to look at port pricing issues; however, the results seem to indicate that practices followed by different ports are not consistent, the effects of competition notwithstanding. Such observations lead Meersman et al. to conclude "Ports, i.e. port authorities and port-based concerns (goods handlers, agents, etc), often go it alone when it comes to pricing" (Meersman et al. 2002:16).

A criticism of port pricing theory and the search for universal principles is helpful in bringing attention back to different market characteristics of each port, its hinterland, traffic density, competitive situation and types of cargo. Pricing is influenced by pragmatic market factors such as:

1. The contributory capacity of the ship or the cargo (i.e. what the ship or the cargo can bear);
2. The 'market rate' for services (i.e. the rate that shipping lines pay in other ports of a same port range, or the rate that they consider for a particular port market as realistic), and
3. The need for port authorities to use pricing as a tool to improve the utilisation of their resources. (De Monie, 2007:2)

South African port pricing confirms to principles of cost base pricing for services. Yet a unique and historically specific variant to strategic pricing is practiced by South African port authorities through wharfage which was changed into cargo dues from 2001 onwards. This pricing practice is elaborated upon in section 3.7.

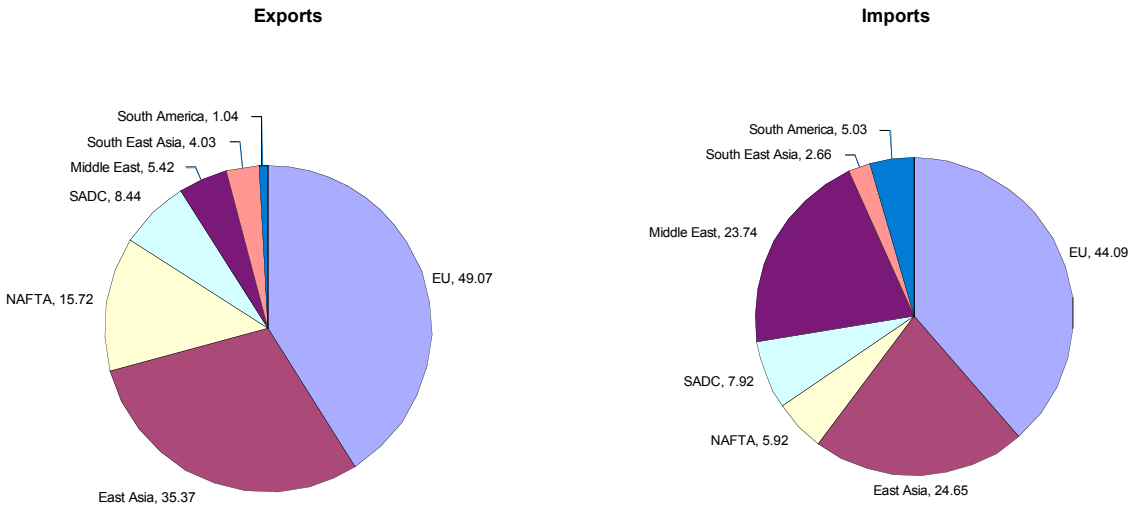
3. South African ports sector

3.1. South African foreign trade

Cargo conveyed through South African ports is measured in tons, which permits accurate comparisons with other ports to assess port performance in the main, however, not all ports measure throughput using identical units. Details of cargo value ceased to be recorded by port authorities after the removal of ad valorem wharfage in 2002, discussed in section 3.7 below. Trade data has been used to establish the origin and destination of goods entering and leaving South Africa. After removing platinum, gold and diamonds a good picture emerges of the categories and values of goods traded. The top ten import and export categories are shown in appendix 2.

Of interest to this study is the direction of trade. Decomposing trade into seven regional trade blocs for imports and exports a picture of the origin and destination of goods shipped through SA ports emerges. More usefully this reveals the North-South and East –West trades on which such goods are moved.

Figure 3 – South African exports to and imports from trading blocks 2005 (Rbn)



Source: TIPS 2007: HS level 4

3.2. South African seaborne trade

South African ports handled a total cargo volume of 179.9-million tons in 2006, approximately 98% of the country's merchandise trade. In international terms traffic through SA ports represented some 2.5% of international seaborne trade for 2005 and some 5% of world bulk commodity traffic (UNCTAD, 2006). The country maritime prominence rises, and importance of port performance for the national economy, when freight ton-miles are taken into account due to the length of the sea leg for SA cargo. South Africa's maritime freight activity has been estimated to contribute 6% to global activity (Jones, 2002). It is also relevant to note that South African ports serve a Southern African hinterland, thus their performance impacts on the competitiveness and economic development of the broader region.

Table 3 – Cargo handled through South African ports, 2006 (metric tons)

Total cargo handled	Landed	Shipped	Landed	Shipped
Imports	46,475,200		25.8%	
Coastwise	3,025,322		1.7%	
Total landed	49,500,522		27.5%	
Exports		121,946,219		67.8%
Coastwise		3,599,181		2.0%
Total shipped		125,545,400		69.8%
Transshipped	4,937,672		2.7%	
Total handled	179,983,594		100.0%	

Source: NPA port statistics 2006

Cargo through South African ports shown in Table 3 reveals the following characteristics:

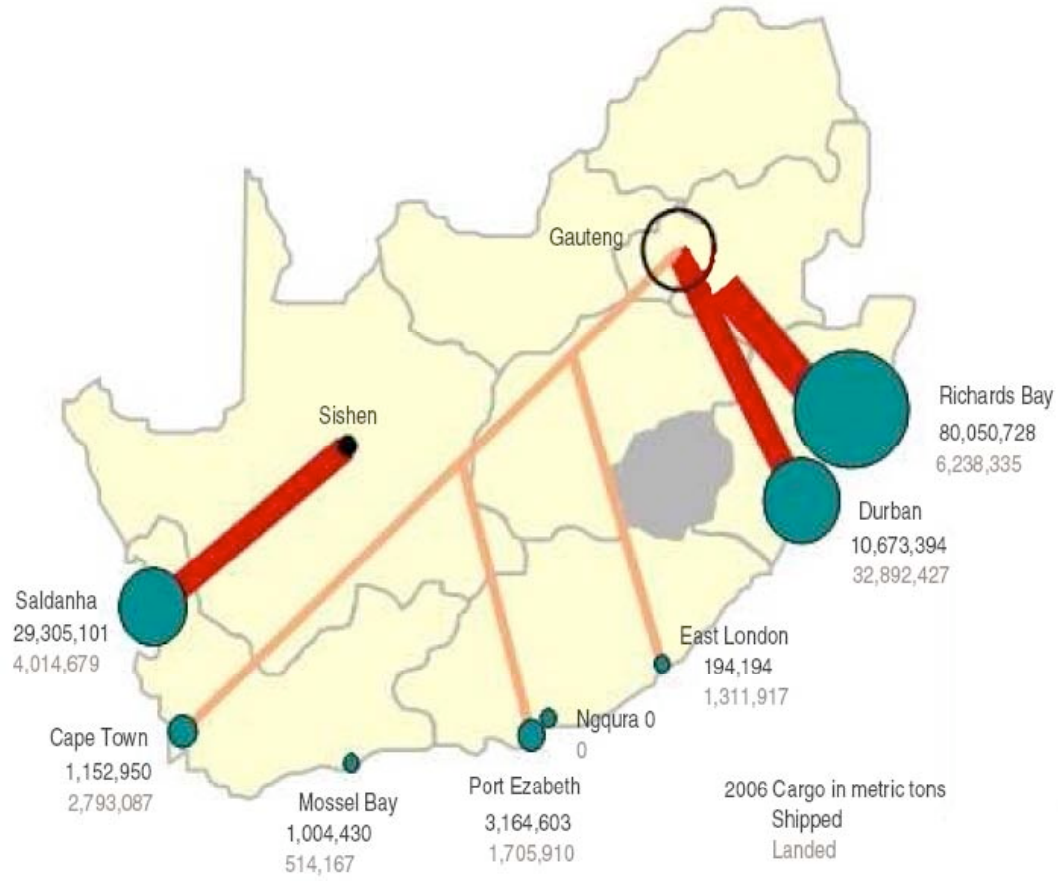
1. Exports volumes are 2.6 times import volumes due to the high share of primary commodities in South Africa's export trade basket.
2. Coastal shipping is negligible given the geographical distribution of production in South Africa. Coastal transport is not a real modal alternative to land transport.
3. Transshipment traffic is low due to the poorly developed markets on the Eastern and Western coasts of Southern Africa.

The above characteristics show South African ports face inelastic demand for services on cargo dominated by domestic consumption of imports. On the export side bulk commodity are highly sensitive to port costs (see Table 1).

3.3. South African ports

Seven commercial ports administered by the NPA with cargo flows for 2006 are shown in Figure 4. The new Port of Ngqura, built 25 km east of Port Elizabeth, has not yet been commissioned. Each port has a certain degree of specialisation with respect to cargos handled and the nature of transport infrastructure connecting it to hinterland markets. Cape Town, Port Elizabeth and Durban are multi-purpose ports with container terminals. Port of Durban handles over 60% by value of South African cargo. Ports of Saldanha and Richards Bay built to export iron or and coal respectively handle 66% of the volume of cargo. Details of port facilities and main cargos handled per port are set out in appendix 1.

Figure 4 – Cargo shipped and landed through South African ports, 2006 (metric tons)



Source: Based on MSA 1999 map. NPA port statistics 2006

3.4. Characteristics of South Africa's maritime trade

Port performance and pricing in South Africa is affected by being on the secondary trade routes and consequently experiencing lower liner connectivity, lower cargo throughput and more variability in service. South Africa had a Liner Shipping Connectivity Index of 29 for 2004; Egypt on the primary Asia-Europe trade routes had a LSCI of 47 (UNCTAD, 2006:118). The implications are as follows:

1. *Limited scale economies*. Economies of scale are restricted by lower level of output limiting a reduction in average costs as output increases. In the capital intensive port industry economies of density are lost when fluctuating demand requires the provision of minimum fixed levels of service, such as tugs, that are unevenly deployed.

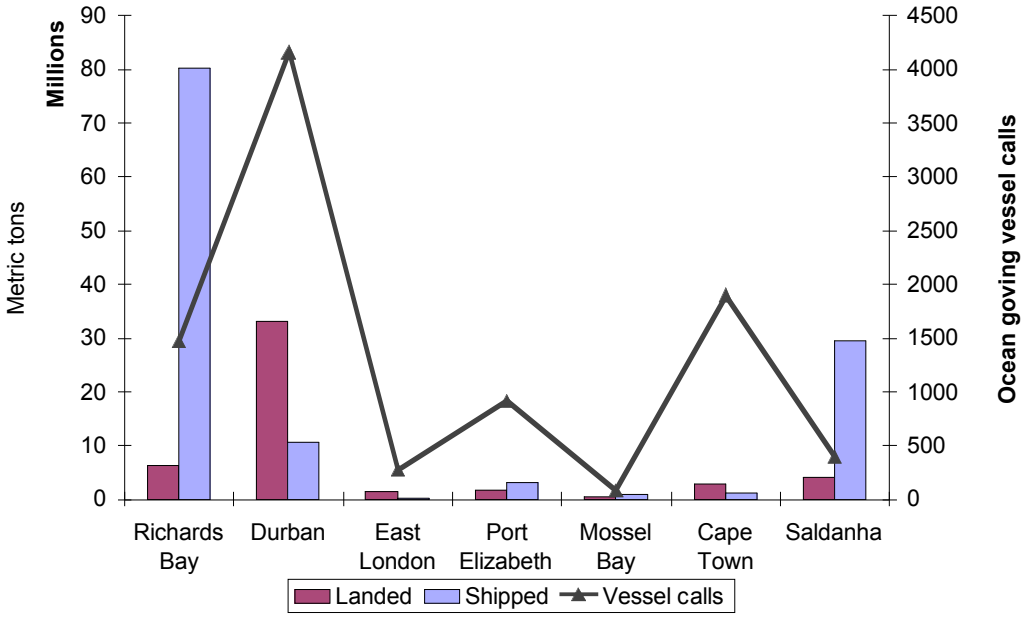
2. Container vessels deployed on South African services are small to mid-sized, up to 4500 TEU and do not approach the economies of scale of the large container ships in service at 7500 up the largest vessel currently in service of 11000 TEU. (Note that South African ports do not have the draft to handle such vessels.)

3. *Multiple port calls*. Shipping lines are required to make multiple calls at Durban, Port Elizabeth and Cape Town to handle the small parcel sizes. Multiple port calls is a consequence of both the diseconomies of scale referred to above and of the high cost of inland transport, and the underdeveloped coastal shipping trade (also

a function of high port costs) that precludes feedering from secondary ports to a hub port. These factors add to costs both through the direct costs of each port call as well as the high risk of schedule disruption from delays in one port having a knock on effect on other ports. Shipping lines have to lower planned utilisation rates by adding slack to schedules or sail at excessive speed to clear disruptions.

Cargo handled against vessel calls shown in Figure 5 depicts the traffic density of ports. Richards Bay and Saldanha handling bulk commodities on larger vessels with Durban and to a lesser extent Cape Town as multi purpose ports handling high traffic of smaller vessels conveying high value cargo. What is also apparent from the same figure is the minor role that East London plays as a commercial port with little vessel traffic and significance of Durban compared to Cape Town and Port Elizabeth with respect to the connection density of vessel traffic and cargo handled.

Figure 5 – Vessel calls at South African ports compared to cargo handled, 2006



Source: NPA Port Statistics

Mean gross tonnage for the major vessel categories calling at main South African freight ports is shown in Table 4 below. The largest vessels on the South African trades call at Saldanha Bay. The volume of coal exports from Richards Bay on Cape sized vessels explains the much larger size of dry bulk carriers calling at that port compared to Durban. Vessel arrivals at South African ports for 2006 is shown in appendix 3.

Table 4 – Mean gross tonnage for major vessel categories per port, 2006

Vessel category	Richards Bay	Durban	Port Elizabeth	Cape Town	Saldanha Bay	Average tonnage
General cargo	21,757	13,331	16,736	13,277	19,854	15,114
Bulk dry	47,022	20,886	23,588	27,128	64,990	37,936
Container cellular		26,380	34,394	31,136		28,892
Containers reefer		8,149	8,799	8,122		8,255
Tanker - Oil	31,053	49,929		33,930	120,159	45,358
Tanker - Chemical	15,990	17,650	19,010	18,191		18,050
Tanker - LPG		20,114				22,174
Car/ vehicle carriers		38,994	44,574	45,796	-	42,050
Roll on Roll off		22,738			-	21,945

Source: Calculated from NPA Port Statistics

Note: Only categories making up a significant share of vessel traffic to each port included

3.5. Market structure

Economic agents in the port sector are numerous but may be grouped for convenience into port authority, shippers, shipping services, marine services, cargo handling companies (stevedores), land-side service providers and government agencies. For the purposes of this study of administered prices the focus is restricted to the industry participants that are state owned.

The roles performed by each link in the maritime logistics chain depend on the delivery terms agreed between buyer and seller for the shipper is not necessarily responsible for arranging carriage. Assuming for simplification shippers who are the cargo owners are selling goods delivered ex ship via container, they contract with a shipping line or through transport operators, brokers and freight forwarders for the carriage of their goods. Shipper's contractual arrangements generally do not stipulate the conditions of carriage, that is left to the shipping line who have contracts with terminal operators for the loading and unloading of goods. Fees charged by the port authority, and charges for marine services and terminal operations are recovered from shippers in freight rates. Cargo handling is charged directly customs duties and clearing fees would in this case be born by the shipper. Actual payment of the various fees may be made directly by shippers handling cargo on their own account or via the consolidated bill from brokers or forwarders itemizing the fees and freight charges due. Bulk cargo is handled quite differently since it is not carried on scheduled liner services. Bulk shipping is by charter where the charterer will engage stevedores to handle the cargo and will bare the cost for the cargo handling.

The NPA is the sole provider of marine services within South African ports. In the four cargo-handling market segments in which SAPO operates, it has a monopoly in car handling and is dominant in container handling and in break-bulk cargo handling. The private sector's share of bulk cargo handling exceeds that of SAPO due to the large volumes handled through petroleum and coal terminals. Private sector bulk and break-bulk terminals are found in Cape Town and Durban handling fruit, refrigerated cargo, sugar, edible oils, steel and mixed cargo.

SAPO operates three dedicated deep sea container terminals yet it does not have a complete monopoly on the container trades as private sector stevedoring companies handle a small volume of containers at private multi-purpose berths.

Table 5 – Public and private sector market share for service categories

Service	National Port Authority	South African Port Operations	Private sector
Marine services	100%		
Bulk cargo handling		37%	63%
Break-bulk cargo handling		78%	22%
Container handling		84%	16%
Car handling		100%	

Source: Author's estimates

3.6. Port charges

Port charges vary with respect to how they are allocated to users depending on the type of trades served, the principle categories being bulk, break-bulk and container. The principle waterfront charges are the following

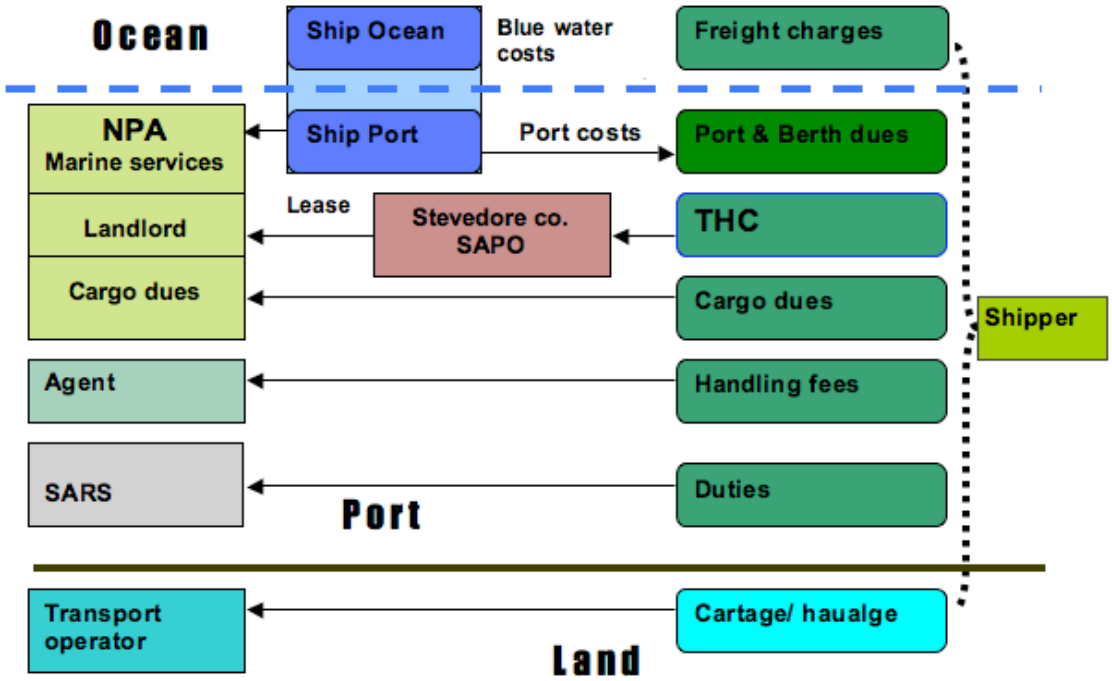
- *Ship-based charges*: pilotage, towage, berthing, for safety, port authority dues on vessels for marine infrastructure and for berth infrastructure, predominantly levied on the basis of the gross tonnage of the vessel.
- *Cargo-based charges*: for the provision of port general infrastructure for handling cargo on the landside.
- *Stevedoring charges*: handling charges for loading or unloading cargo and its handling from receipt to dispatch. Stevedoring, previously the term reserved for loading and unloading of cargo on board ship as distinct from handling on the quay side now includes handling cargo on the quay in terminals. Consequently cargo handling is predominantly referred to as port operations and the charge a Terminal Handling Charge (THC)
- *Landside charges*: including customs duties, fees to brokers, freight forwarders and other transport operators. These charges are not examined in this study.

Container operations are charged on a Terminal Handling Charge basis for which handling costs are aggregated to obtain a standard equalised THC for each type of container (normal, dry, hazardous, reefer, out of gauge) for the standard 20'/6m and 40'/12m or 45'/13.7m container sizes.

Charges for break-bulk and bulk shipping vary depending on the delivery terms chosen by the shipper.

Waterfront charges are detailed and analysed in sections 5 and 6 of this report. The NPA derives revenue from marine services, landlord services and cargo dues. Stevedore companies own or high cargo handling equipment and hire labour to work ships. This study is exclusively concerned with Transnet's SAPO division which derives its revenue from stevedoring services at terminals where it has beneficial use of the terminal equipment. In addition to freight charges to the shipping company for carriage, the shipper is required to pay cargo dues and handling fees, as well customs duties, these charges are depicted in figure 6. The actual responsibility of the parties for paying for different services in maritime trade is governed by the commercial terms agreed between them and standardised into international commercial (INCO) terms. Numerous trade term permutations exist beyond free on board or cost, insurance and freight contracts.

Figure 6 – Principle South African port charges



Source: Author

3.7. The burden of history in port pricing

Four separate institutional forms of port administration have evolved in South Africa, each with distinct pricing policy. Meersman et al. argue emphatically that, "Pricing by ports and operators within ports is historically determined. It is often quite a complex and untransparent matter, and as such is sometimes perceived as archaic" (Meersman et. al. 2002:2). Pricing in South African ports unequivocally fits this pattern and arguably remains archaic.

Prior to the establishment of the Union of South Africa in 1910 the commercial ports of the Cape and Natal colony were administered under the control of each colony. The harbours were financially autonomous administered its own tariffs and all revenue and expenditure accrued to the harbour administration of the colony. Inter port competition was strong and promoted competitive tariffs, as each port authority tried to secure as large a traffic base of the primary traffic destined for the reef as it could as well as agricultural exports from its hinterland.

The nearest port access for the Witwatersrand was Lourenço Marques, now Maputo in what was then Portuguese East Africa. Under a treaty agreement involving, inter alia, access to labour from the colony for the gold mines, payment to colonial administration in gold at a fixed exchange and guaranteed port and rail traffic, the port at Maputo and rail link carried the bulk of the reef's cargo until Mozambique's independence in 1975.

The Union of South Africa, 1910, ushered in the second phase of port administration. Union involved unification of both the harbour and railway authorities into the South African Railways and Harbours (SAR&H, 1909-1981). To block conflicts amongst the various colonies and inter-port competition a uniform tariff structure was introduced.

Pricing under SAR&H was aimed at running the ports on sound business lines and to be financial self-sufficient, however ports and rail were required to offer preferentially cheap transport for the agricultural and industrial sectors. Under this institutional form there was a large degree of cross-subsidisation from the surplus profits generated by harbour activities to cover the losses incurred by the railways (Jones, 1988b, quoted in Chasomeris, n.d.).

In the third period the harbours and railway administration was transformed into a state owned commercial enterprise, South African Transport Services in 1981. Principles in the enabling legislation required ports to be run sound business lines and dropped the agriculture and industry preferences for serving the transport needs of the country as a whole. Such objectives were incompatible with uniform tariffs SATS adhered to, leading Chasomeris to conclude "Although the new system reduced inter-modal cross-subsidisation that placed harbour profits in better perspective, there was still some surviving inter-modal and considerable intra-port cross subsidisation" (Chasomeris, n.d:6).

In 1989 the Nationalist Party Government instituted the corporatisation of SATS which required the incorporation of a new private company, Transnet (Pty) Ltd, a holding company in which the unincorporated divisions of ports (Portnet), rail (Spoornet), commuter rail (metro rail), pipelines (Petronet), airways (South African Airways) and several other enterprises were housed. Transnet is a wholly state owned enterprise. It is a private limited liability company with a single shareholder, the Minister of Public Enterprise and is required to submit it's annual financial statements to parliament. The Transnet period of port administration has witnessed a major revision to the institutional form of port administration and established a de facto port authority. In 2001 Transnet's Portnet division was sub-divided into the National Ports Authority in which were housed the port administration, infrastructure and marine services functions. Terminal operations were allocated to the South African Ports Operation division. Both divisions provide narrative reporting for their operations yet the segment reporting for Transnet's annual financial statements belie the division and provide a maritime segment as an accounting reality. The maritime sector provides the largest profit contribution to Transnet. As with its predecessors the ports have and remain the most profitable division of Transnet.

The changes were pursuant to the adoption of a landlord port architecture for South Africa and predated the publication of government policy in the National Commercial Ports Policy white paper of August 2002 or the National Ports Act no. 12 of 2005. Changes to the architecture of South African ports administration contemplated in the policy and legislation have not been carried through to completion. Some details of the intended changes which are expected to impact on port operations and port services in future are noted in section 4 below. The Transnet period has laid the basis for laid basis for more transparency in the pricing of port services in next stage however the fundamental structural form that persists with beneficial ownership of ports lying with Transnet makes South Africa port management unique and unenviable, as government has recognised:

> *"Having a national ports authority function as part of a transport company has resulted historically in the formation of several undesirable conditions that have detracted from the primary purpose of ports, skewing prices, misallocating port revenues and creating suspicion in the maritime and transport industries about the impartiality of the port entity within a transport company." (RSA, 2002: § 3.1)*

3.7.1. Wharfage

Wharfage is a category of general tariffs levied by port authorities which is typically charged on a unit basis (tons, cubic meters, TEU) may be value based corresponding to the value of the cargo, and serves to "produce revenues to pay for wharves and land-side infrastructure, equipment and administration" (UNCTAD, 1995:16). Where authorities apply a value based approach rather than a unit basis port pricing may impact on trade performance and lower efficiency. Wharfage is currently levied on container ships by all the ports in Australia. The port authorities of Nagoya and Hamburg do not levy wharfage on container cargo. Wharfage is included in container handling charges at the ports of Singapore, Port Klang, Philadelphia and Tilbury. What marked South Africa apart was the manner in which wharfage functioned as the key revenue contributor and central financing instrument for the state rail and port system. Wharfage was introduced in 1925 and has profoundly shaped the country's transport system. It is a legacy that has been carried through into the current era of port pricing via cargo dues. Briefly the key characteristics of wharfage as applied in South African ports have been the following:

1. Wharfage was applied on an ad valorem basis levied at a fixed rate (later the cargo value was capped) on the value of the cargo as declared by the manifest;
2. Ad valorem wharfage made revenue subject to exchange rate fluctuations and prices changes yet the overall price trend (and currency movement) served to raise revenue to the ports without requiring ports authorities to increase the wharfage rate;
3. Ad valorem wharfage collection raised more revenue from high value cargo proportionally to low value cargo regardless of their use of infrastructure and port services;
4. Ad valorem wharfage supported import substitution policies by charging a higher rate for imports and lower rates for exports of identical cargo.

South African shippers objected to the ad valorem wharfage, arguing that it was a tax on trade in view of the shipping and cargo handling charges that were applied. They were, however, unsuccessful in legal challenges against the port authorities. Without alternatives, with inter-port competition prohibited, shippers were compelled to pay wharfage which authorities justified as being used to finance rail access and general cargo infrastructure.

Ad valorem wharfage reinforced tariff barriers, discouraged imports, particularly of high value cargo, raised the cost of exports and made South African ports expensive links in the logistics chain. For port authorities, the administrative advantages of revenue raising through ad valorem wharfage was irresistible and it made up the main source of port revenue with a gross margin of 300% to 400% (Jones, 2002b in Chasomeris, n.d.). Under recoveries in marine services were eliminated by wharfage revenue. South African ports were, as a result, profitable entities, with aggregate port charges that were high at the prevailing productivity rates. Port pricing as a consequence was artificially cheap for vessels and artificially expensive for cargo on the basis for a tariff system that made sense for neither (Jones, 2002). Port service

and operations prices up to the sub-divisionalisation of Portnet in 2001 were highly skewed, e120stimated values for the tariff categories in the table below.

Table 6 – Price distortions in port tariff categories prior to 2001

Function	Tariff	Price/cost skewness	% of total revenue
Marine infrastructure	Port, berth dues	Prices well below average costs	3
Marine services	User charges	Priced below average cost	6
Cargo working infrastructure	Ad valorem wharfage	Price substantially exceeds average cost	55
Cargo services	User charges	Price equal average costs	30
Miscellaneous (lights, etc.)	-	-	6

Source: Chasomeris, n.d. 7 adapted from Jones (1988b: 5)

Through the pricing system applied in the ports wharfage made up the bulk of revenue for Portnet and the major profit contributor to Transnet. Port users burdened with high port costs were aggrieved but impotent to challenge the diversion of revenue raised ostensibly for infrastructure that was not channelled into port infrastructure. Instead the profits from the ports were diverted elsewhere within Transnet and its predecessors to cross-subsidise less profitable or loss making operations in rail and road transport services as well as cover pension liabilities.

The institutional arrangements of the publicly owned port and rail services made the use of wharfage a rational and effective instrument for the financing of port infrastructure and superstructure. Government and the fiscus, by allowing the port authorities to follow a pricing practice based on "what the cargo could bare" was relieved of the full burden of financing port development directly and as such, completely condoned the practice.

3.7.2. Tariff reform 2001-2002

South Africa liberalised its trade tariff regime at the in the early 1990s. The process of reorienting the country's trade policy from import substitution to export led growth started before the transition to democracy with an offer to GATT in 1990. High waterfront charges contradicted government's macro-economic stance in practice and the fact that port pricing remained unchanged until 2001 is an indication weight of the structural rigidities in the economy and it's slowness to adjust to policy changes.

Wharfage imposed at the rate of 1.8% on imports and 0.9% on exports was reduced by 0.02% and 0.01% respectively in 1991 to offset the introduction of Value Added Tax at 14% in place of what had been a general sales tax. The effect of reduction was negligible, port costs continued to rise on the twin effects of a strong expansion in post-sanctions merchandise trade, particularly of manufactures and a weakening currency. Driven by the aforementioned factors and completely contrary to trade and emerging transport policy "by 2001 rand denominated wharfage costs to both importer and exporters were at their highest" (Chasomeris, n.d:9).

High logistics costs and the burden of transport costs on the competitiveness of South African exports was forcefully articulated in the Moving South Africa report of 1995 and the Transport White Paper of 1996. Government policy towards SOEs was directed at effecting restructuring to improve their international competitiveness and encourage private participation in financing and operating facilities.

In face of inefficiency and costly port congestion pressure for a tariff reform mounted. At a policy level it resulted in the adoption of the National Commercial Ports Policy.

> *"South Africa has also adopted a new Ports Policy in terms of which landlord functions have been separated from port operations. Landlord functions are being performed by the National Ports Authority of South Africa. Operations will see greater participation by the private sector to enable our ports to cope with the needs of the economy and the increasing business in our ports.*
> *"...the strategic goals of this national policy on ports will reflect not only the transport perspective, but also the industrial (trade and manufacturing) and the market (consumers and suppliers), and the national political system. The purpose of this policy is to ensure affordable, internationally competitive, efficient and safe port services based on the application of commercial rules in a transparent and competitive environment applied consistently across the transport system" (RSA, 2002:4).*

The policy appeared to target both the absolute level of port costs, distortions in port pricing between infrastructure and handling costs and the diversion funds raised on port users out of the ports sector.

Tariff reform consisted of a 4.49% reduction in ad valorem wharfage in 2001 lowering the rate from 1.78% to 1.7% for imports and 0.89% to 0.85% for exports. (NPA Port Tariffs 1 April 2001). The following year wharfage was eliminated and a new charge of Cargo dues was introduced. "Cargo dues on all commodities, articles, things or containers (full or empty) is levied at all ports belonging to or controlled and managed by Transnet (NPA Port Tariffs 1 April 2002)" echoing the description of wharfage in previous years. The given definition reads, "Cargo dues are charged to recover the cargo contribution towards port infrastructure" (NPA Port Tariffs 1 April 2006:7.1). Cargo dues were levied in unit form per ton or TEU.

Table 7 – Cargo dues levied in 2002, R per ton/per container

	Bulk	Break-bulk	20' containers	40' containers
Imports	40	85	1,480	2,960
Exports	30	70	735	1,470

Source: NPA Port Tariffs 1 April 2002

The replacement of ad valorem wharfage with cargo dues resulted in a dramatic hike in the rates paid by the low value cargo that had been advantaged by the previous system. More importantly it resulted in a reduction in the costs born by high value cargo. Chasomeris estimated the effects on high and low value container cargo due to the change as a 67% decease in cost for high value cargo and a 24% increase for low value cargo (Chasomeris, n.d:17).

The full impact of the price adjustment on port users is not known as data on cargo values ceased to be collected with the change to cargo dues, however the NPA estimated that the total effect of the tariff reform between 1 April 2001 to 1 April 2003 was estimated at R791m. (NPA Tariff adjustment schedule 2006.)

3.8. Strategic port pricing

Cargo dues continue to provide the bulk (70%) of the Port Authorities income, tariff reform notwithstanding. High cargo dues levels show that strategic port pricing is

practiced in South Africa as pricing is based on meeting objectives outside of the financing and operation of port infrastructure and services. Moreover, the cargo due pricing structure discriminates between imports and exports, the former being 50% higher than equivalent export dues. In this respect the Port Authority impacts on trade policy whilst it is outside of government's suit of instruments to influence trade such as customs duties. Cargo dues are even collected on empty containers (see section 5.2.3) which give the lie to the justification that cargoes should contribute to the payment of port land and cargo handling infrastructure, but does help to increase Port Authority revenue.

4. Institutional and regulatory frameworks

Port management comprises a set of core activities that all ports have in common with one or more organisation carrying out the following roles:

- Landlord for private entities offering a variety of services;
- Regulator of economic activity and operations;
- Planning for future operations and capital investments;
- Operator of nautical services and facilities;
- Marketer and promoter of port services and economic development;
- Cargo-handler and storer; and
- Provider of ancillary activities. (World Bank, 2001)

South African ports management and institutional structures combine the features of a tool port in which the port authority owns, develops and maintains the port infrastructure as well as super structures and cargo handling equipment and such equipment is operated by port authority staff together with features of a landlord port in which the authority acts as a landlord and regulator and port tenants, usually private sector companies, perform operations. Under Transnet the sub-divisionalising of Portnet into NPA and SAPO has moved port management closer to a de facto landlord management system.

Pertinent aspects of South African ports management are as follows:

1. Ports are owned by the SOE Transnet which is wholly owned by RSA Government governed by a board of directors appointed by the Minister of Public Enterprises;
2. Ports combine the tool port and landlord model by providing marine services and lease cargo handling facilities the private sector as well as a division of the same company;
3. Port governance is indirect, with control and direction of ports exercised through point 1 above. Legislation controlling maritime safety requires such matters to be reported directly to the Ministry of Transport. Until such time as the National Ports Act no 12 of 2005 is brought into effect port objectives and governance is not specifically provided for in legislation.
4. Port finance is subject to government direction of Transnet on capital raising, investments and payment of dividends. Transnet is a major public entity listed in Schedule 2 of the Public Finance Management Act no. 1 of 1999. Ports do not directly or indirectly via Transnet receive government financial support.
5. Ports indirectly pay taxes and dividends through Transnet. Profits from ports services and operations are commingled in Transnet income and losses.
6. Regulation of port activities is housed within the National Port Authority division and will remain there until the National Ports Act is brought into effect.
7. Price and competition regulation is not exercised over port services or pricing.
8. Investment approval for port expansion requires exceeding a rate of return hurdle set by the Transnet board. It is not know whether investment approval for port of Ngqura was subject to the same financial criteria.
9. Port facilities and fleet craft are valued using the modern equivalent asset method. Port operations are valued on a fair market value and depreciated replacement cost.

10. Leasing arrangements are made on commercial basis subject to optimal use considerations for scarce port land. The NPA has migrated leases with some historical anomalies onto commercial terms.
11. Procurement by ports is on a competitive basis subject to a) Black Economic Empowerment policies of Transnet, b) Industrial Participation programme for SOEs and c) applicable supply chain management practices of the PFMA.
12. Pricing practices are directed at the recovery of the full cost of supplying services and generating economic returns to Transnet from port services and port operations.
13. Price discrimination may occur in the pricing of port services and operations however the extent of this practice cannot be conclusively determined as such information is commercially sensitive. The NPA publishes tariff book. SAPO ceased to publish tariffs in 2004. The application of price discrimination is inferred from the conduct of SAPO and NPA tariff adjustment practices.

For each of the preceding points listed custom, practice and policy followed by ports around the world differs with significant influences on the comparability of port pricing. Pricing practices provide a pertinent example. In jurisdictions where harbour dues are determined by the budgetary needs of the tier of government that own the ports price setting outcomes will differ from South Africa. Nevertheless before benchmarking is completely abandoned it is well to remember that the competitiveness of logistics costs is a crucial factor in a country's trade success and exerts pressure on ports to contain costs and raise productivity.

Transnet is at the centre of the regulatory environment exerting a policy function, economic regulation over port landlord, pricing and infrastructure, the active infrastructure function for ports and rail and sharing port operations with the private sector (DOT, 2005). Unsurprisingly, regulation is judged to be fragmented, with inconsistent and overlapping roles and responsibilities without effective regulatory government oversight. Moreover, "there is direct conflict with de facto economic regulation undertaken over entities within the control of the same organisation" (DOT, 2005:10) with direct reference to ports. The conclusion drawn from this situation is that "policy is often driven by the state of the balance sheet of the SOEs and is not always aligned to the national interest" (DOT, 2005:11).

The problems referred to above are intended to be overcome by the National Ports Act (no. 12 of 2005: §2):

> *"2 The objects of this Act are to –*
> *(a) promote the development of an effective and productive South African ports industry that is capable of contributing to the economic growth and development of our country;*
> *(b) establish appropriate institutional arrangements to support the governance of ports;*
> *(c) promote and improve efficiency and performance in the management and operation of ports;*
> *(d) enhance transparency in the management of ports;..."*

A premature assessment of Act may be made by subjecting the powers it confers on the regulator to a legal critique. Judged thus the Act gives limited powers the regulator and fails to provide it with effective sanctions. The real test of course will only come when port users and government have been able to judge its effectiveness in practice.

Port users are understandably expectant that the port regulator will improve pricing efficiency within South African ports. The establishment of a port regulator will be a

significant step in the institutional arrangements for South African ports. However, the basic structure of the market will remain unaltered. Moreover the control of the port authority and a substantial share of the port operations activity by Transnet implacably negates the market structure principles of a landlord port architecture.

Regulatory bodies have not been a central contributor to ports pricing and efficiency globally. Ports that are leaders in pricing and performance measures around the world are in countries where there is no regulatory body, or if it does exist it has exercised minimal intervention. These ports are located in regions characterised by a high degree of port competition. The implications for administered pricing in South Africa ports from this body of world experience that directly addresses the characteristic's of maritime trade to our shores is the critical requirement for government to accept the practical necessity for intra and inter port competition and carry it through into the institutional structure implied by the objects of the National Ports Act.

5. Port Authority

Income to the NPA is earned from thee major sources: lease income, marine services and cargo dues. Each source's relative contribution is estimated to be as follows:

Table 8 – Principal NPA revenue sources

Income stream	Estimated share of total revenue
Lease income	13%
Marine services (Pilotage, towage, berthing, safety services, repair facility hire and miscellaneous charges)	17%
Infrastructure charges (Lights dues, port dues, berth dues)	
Cargo dues	70%

Source: Interview[a]

Cargo dues continue to provide the overwhelming bulk of port authority income. Comparison with charges prior the tariff reform exercise suggests that after stripping out cargo handling, wharfage charges shown in Table 6 relative contribution to the authorities income has declined only from 79% to 70% despite the stated intention of tariff reform to reducing the over recovery on wharfage and making marine services more reflective of actual costs. In light of the significant price hike via a once-off adjustment in 2001-2002 examined below it would be reasonable to assume that marine services are now fairly priced.

Information was not made available on the division between marine services and marine infrastructure. Marine infrastructure charges were adjusted through a once-off substantial hike in 2002 yet the share that marine infrastructure charges make up in the port authorities basket of dues is small. Port and berth dues constitute a major part of port authority revenue in virtually every other port in the world, yet in the case of the NPA they are a minor revenue stream owing to the substantial income derived from cargo dues.

Trends in port tariff rates from the official tariff book will be briefly discussed. Small craft, fishing vessels and police and navy vessels are treated differently or exempt and will not be discussed in this report.

5.1. Marine services

Marine services, comprising pilotage, towage and mooring, provide assistance to ships to safely enter and leave ports and to move around within a harbour. In South Africa, the port authority has historically provided these services, although private providers could render such services, as is the case in some ports.

Pricing for marine services is based on a basic minimum unit charge for the service plus an additional amount for the vessel size based on the ships gross tonnage. Additional charges are levied for delays or cancellation of services.

5.1.1. Pilotage

Pilots control a vessel in the approaches and manoeuvring within a port to ensure safe passage. Pilots are certified for competency by the port authority. Exemption certificates are provided for small ships, police and naval vessels. South African ports are compulsory pilotage ports.

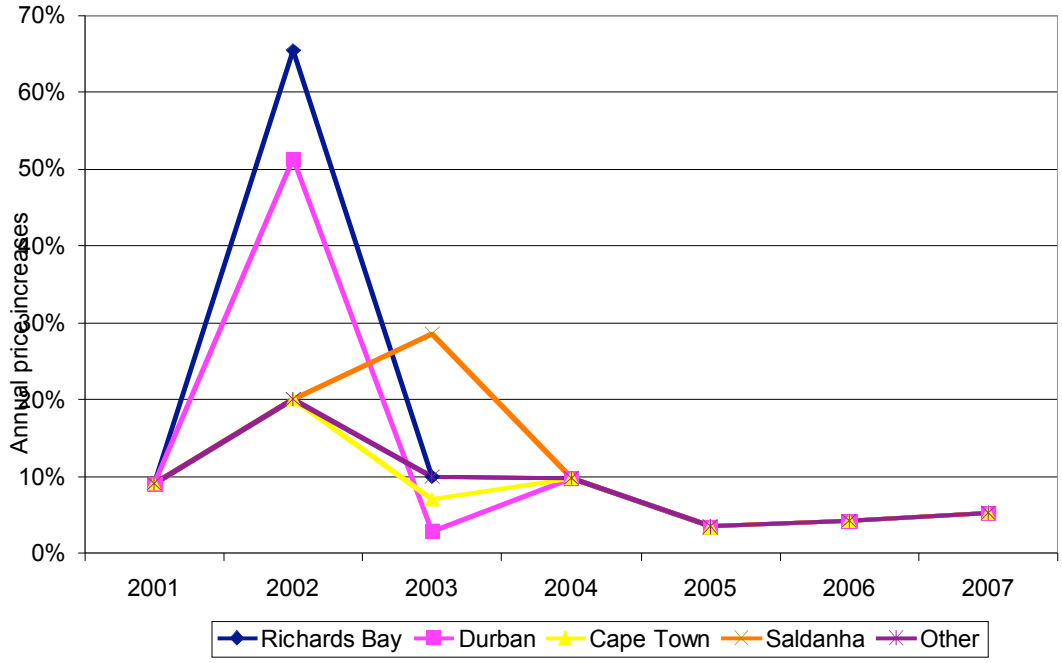
Pricing is based on the size of the vessel in gross tones. Costs would vary with the distance of the pilotage service and the degree of navigation hazards found in each port and its approach. Port users, however, could not identify significant cost factors that would explain the variation in pilotage charges between the main cargo ports (interviews[l n]).

Table 9 – Basic pilotage charge per service per port, 2000-2007 (Rands)

Port	2000	2001	2002	2003	2004	2005	2006	2007
Richards Bay	2,770	3,047	8,800	9,768	10,833	11,223	11,728	12,384
Durban	2,520	2,772	5,700	5,871	6,511	6,745	7,049	7,444
Cape Town	1,354	1,489	1,861	2,001	2,219	2,299	2,402	2,537
Saldanha	1,585	1,744	2,180	3,052	3,385	3,507	3,664	3,870
Other	1,354	1,489	1,861	2,066	2,291	2,373	2,480	2,619

Source: NPA tariff books, various years

Figure 7 – Pilot charges annual increase, 2001-2007



Source: NPA tariff books, various years

A significant upward adjustment to pilotage charges occurred in 2002 as the NPA when through its tariff reform exercise. From 2005 onwards, pilot charges have increased in line with CPIX. Over the period reviewed basic pilot charges for Richards Bay have risen 78% and for Durban 66%. Pilot call rates are unknown but it would be reasonable to conclude that ports with low ratios of vessel calls would have a higher unit cost with costs fixed at the level required to provide the required level of pilot service.

5.1.2. Towage

Harbour towage involves tug/ craft assistance and or attendance to enable ships to enter and leave ports, to berth and to manoeuvre through navigation channels and turn in turning basins en route for berthing or sailing. Safety of vessels and port facilities taking account of the size and steering characteristics of the vessel as well as variable conditions such as weather are factors that will determine which tugs are used. NPA rules stipulate that the port will decide the type and number of craft allocated for a service. Basic charges for the largest vessel category of 28,300 gross tones are shown the table below. Similar to pilotage factors affecting towage costs would be navigational hazards, distance, vessel calls and harbour conditions. NPA cost factors are unknown, yet it is interesting to observe the difference between Durban and Cape Town, with the latter experiencing far greater weather disruptions to shipping and hazards from high wind and seas and the former having a higher vessel call rate and more clement weather, yet being more expensive.

Table 10 – Basic towage rates for vessels 28300 tons per port, 2000-2007 (Rands)

Port	2000	2001	2002	2003	2004	2005	2006	2007
Richards Bay	12,812	14,093	17,616	19,554	21,685	22,466	23,477	24,792
Durban	11,372	12,509	15,636	17,981	19,941	20,659	21,588	22,797
Cape Town	9,134	10,047	12,559	13,501	14,973	15,512	16,210	17,117
Saldanha	11,372	12,509	15,636	21,890	24,276	25,355	26,282	27,753

Source: NPA tariff books, various years

Prices have increased between 47% and 59% from 2000 to 2007. In 2002 all prices were increased 20% and averaged 10% per annum to 2005 when annual increases tracked CPIX.

5.1.3. Berthing and running of ships lines

The port authority provides services for berthing and unberthing a vessel entering and leaving a port, shifting berths and related services for vessels undergoing repairs, remooring, engine trials and the like. The port authority also provides linesmen for tying up and letting go ships. Berthing services are charged as a basic charge plus additional for tonnage. Larger vessels require more linesmen and use heavier lines, which require more labour to handle, consistent with the larger ships calling at Saldanha Bay. Tariff increases for both services per port suggest than efforts were made between 2002 and 2004 to make these charges more cost reflective and reduce inter-port cross-subsidisation. However, as the rates of increase off a uniform charge are the same, this suggests that price adjustments have been made using a percentage increase factor, without reference to true costs. Saldanha Bay shows the same 28.6% increase was applied to all marine services in the port in 2003.

Table 11 – Berthing and running of ships lines

Berthing services	2000	2001	2002	2003	2004	2005	2006	2007
Richards Bay	656	722	903	1,002	1,111	1,151	1,203	1,270
Cape Town	579	637	796	963	1,068	1,106	1,156	1,221
Saldanha	656	722	903	1,264	1,408	1,452	1,518	1,603
Other	579	637	796	884	980	1,016	1,061	1,121
Running of ships lines								
Cape Town	684	752	940	1,044	1,158	1,199	1,253	1,324
Saldanha	684	752	940	1,316	1,459	1,512	1,580	1,669
Other	684	752	940	1,044	1,158	1,199	1,253	1,324

Source: NPA tariff books, various years

5.2. Port and marine infrastructure

Charges are raised for navigational aids, pollution control, port and marine infrastructure. The pricing principles used are based on the vessels size in tons. In South Africa conservancy charges are levied for small craft to use ports. Elsewhere in the world the conservancy charges are used to cover the costs of providing navigational aids outside of port precincts.

International comparability of port and marine infrastructure charges requires clarifying the institutional structure governing the port and its relationship with various tiers of government since financing or subsidisation of port infrastructure may be undertaken by a government structure that is not apparent from the tariffs for different ports. For example, maintenance of approach channels at USA ports is undertaken by the U.S. Army Corps of Engineers.

5.2.1. Light dues and vessel traffic services

Light dues on ocean going vessels are charged on a tonnage basis. The charge is levied at the first port of call and remains valid for all ports on the ships voyage while it does not proceed beyond the borders of the South African coastline. This pricing approach favours shipping lines making multiple port calls. Light dues are a small share of port cost. Tariff increases since 2001 suggest prices were historically substantially below costs. In 2002 a 70.1% increase was applied to light dues. Thereafter price increases have followed the minimum annual increases applied by the NPA.

In 2002 the NPA introduced a new charge for Vessel Traffic Services in the interests of safe navigation, pollution and conservancy of the ports based on the gross tonnage of a vessel. VTS charges are paid on a per-port call basis.

5.2.2. Port dues and berth dues

Port dues are charged by the port authority for mooring, protected water, channels and berths. The pricing principle is a charge for the time the vessel is in the port precincts. Port and berth dues are uniform across all ports irrespective of infrastructure or maintenance expenditure at particular ports. The charges are levied on a per tonnage basis for ships entering the port from the time of passing the entrance inwards until the time of passing the entrance outwards. Charges are on a basic charge plus an addition per 24 hours basis. Port dues are levied on ships entering the port plus vessels taking on bunkers at designated anchorages or waiting at offshore moorings. Port and berth dues are charged to the vessel owner.

Berth dues are paid by vessels at repair quays or not working cargo in addition to port dues.

Table 12 – Port dues and berth dues scale of charges, 2000-2007 (Rand)

Item	2000	2001	2002	2003	2004	2005	2006	2007
Port dues: basic charge per 100t	15.33	16.71	61.48	65.48	67.44	69.87	73.01	77.10
Port dues: addition per 24hr	4.60	5.01	18.43	19.63	20.22	20.95	21.89	23.12
Berth dues: up to 17,700 tons per 24hr	4.02	4.38	16.12	17.17	17.69	18.33	19.15	20.22
Port dues on 28,800t container ships 24 hrs	5,740	6,255	23,014	24,512	25,246	26,156	27,331	28,863

Source: NPA tariff books, various years

In 2002, a 78.2.1% increase across the board was applied to port and berth due rates. Thereafter price increases have followed the minimum annual increases applied by the NPA.

5.2.3. Cargo dues

Cargo dues are charges levied on cargo owners to recover a portion of costs of providing port infrastructure. They are collected by the port authority from ship operators or their agents who have been contracted by cargo owners for carriage. The history of wharfage and cargo dues has been extensively discussed in section 3.7.

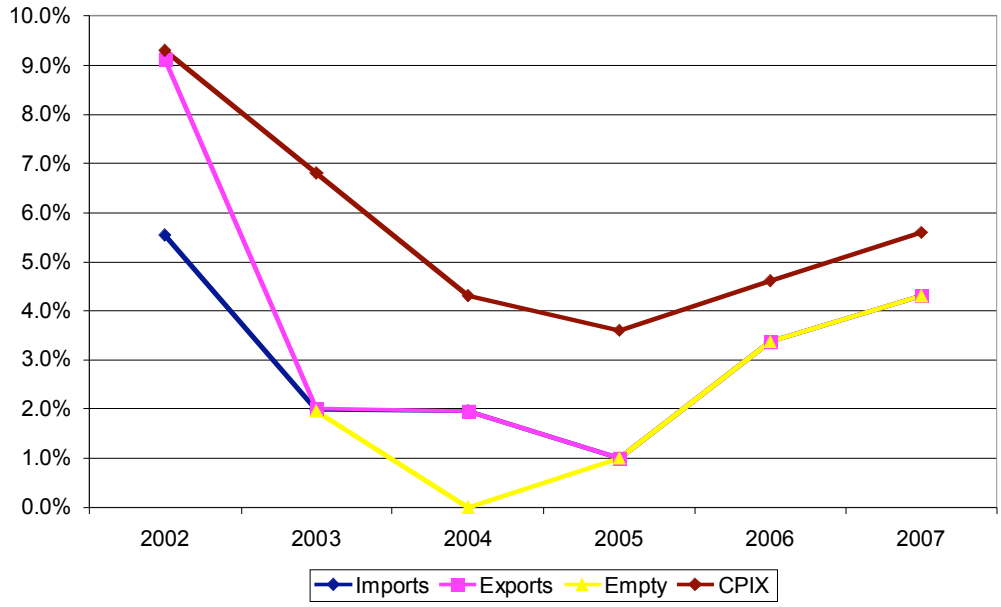
Table 13 – Cargo dues per container, 2001-2007 (Rand)

Size	2001	2002	2003	2004	2005	2006	2007
20' imports	1,398.00	1,480.00	1,510.00	1,540.20	1,555.60	1,610.05	1,682.50
40' imports	2,796.00	2,960.00	3,020.00	3,080.40	3,111.20	3,220.09	3,364.99
20' exports	668.00	735.00	750.00	765.00	772.65	799.69	835.68
40' exports	1,336.00	1,470.00	1,500.00	1,530.00	1,545.30	1,599.39	1,671.36
Empty		50.00	51.00	51.00	51.51	53.31	55.71

Source: NPA tariff books, various years

Cargo dues are the principle source of NPA revenue, providing 70% of its income. Their absolute level and rate of change is the single most important price component of South African ports. In 1992, the anniversary of their introduction import rates rose by 5.1% and export rates 9.1%. Annual increases since 2003 have been kept well below CPIX but have started to rise since 2005.

Figure 8 – Cargo dues on containers annual percentage increase, 2002-2007



Source: NPA tariff books, various years

In 2003, the second year after the introduction of Cargo dues, the NPA introduced 110 specific commodity rates across break-bulk, dry bulk and liquid bulk. To date the commodity schedule has risen to 124. Commodity specific charges enabled the port authority to accomplish the following:

1. Differentially levy charges on commodities in relation to their value and demand elasticity;
2. Price cargo dues in on the basis of the value of the cargo with a weak link to its 'consumption' of port infrastructure required for its handling. For example, dues on exports of paper and paper products, which require very careful handling and are susceptible to damage, are similar to dues on malt exports.
3. Impose a import barrier through charging more on imports than exports, ranging from 20%, 33% and 100% for non specified break-bulk, bulk and motor vehicles on own wheels respectively;
4. Act an instrument of trade policy by changing the ratio between import and export dues and eliminating the differential on some commodities, for example agricultural products and steel.

Table 14 – Cargo dues annual percentage increase, 2003-2007

	2003	2004	2005	2006	2007
Cargo dues	2.0%	2.0%	1.0%	3.4%	4.3%
CPIX	6.8%	4.3%	3.6%	4.6%	5.6%

Source: NPA tariff books, various years

Increases in cargo dues have been kept well below the rate of change in CPIX in line with the tariff reform objective of rebalancing the share of revenue contribution from marine services and infrastructure charges.

5.3. Landlord services

Landlord services are an import part of the port authority role to make optimum use of port land and plan for facilities required by port users. No pricing information has been obtained from the NPA. Consequently comments addressed to pricing of landlord services are confined to those made in section 4 on Institutional and Regulatory Frameworks and in Table 8.

6. Port operations

South African Port Operations provide cargo handling services on board ship and land services at 15 terminals in all commercial ports except Mossel Bay and Ngqura. SAPO operates in four markets, dry bulk, break-bulk, containers and cars. It has a dominant share of these markets except for dry bulk, as shown in Table 5, thus the performance of SAPO has a material impact on the costs and performance of the South African waterfront.

Historically, cargo handling by Portnet was priced equal to average costs argued Jones (1998), (see Table 6) due to intra-service cross-subsidisation. In comparison with other developing and developed countries MSA 1998 found terminal charges in South Africa to be low. At the point of sub-divisionalisation in 2001 SAPO was established as a low priced terminal operator with significantly depreciated assets. No information is available on SAPO's own pricing methodology however prices for services were increased by large amounts during 2001-2003 while the NPA undertook its tariff reform. SAPO's reported losses in the first year of its operations and took two years with large top line growth to move into profit. Some SAPO customers (interview[l]) are of the opinion that during the tariff reform period, SAPO took the opportunity to raise its margins and to put port operations into a better position to attract private sector operators, as was government's intention prior to 2003.

Prices for terminal operations provided by SAPO are offered on quotation to customers and confirmed by contract. Prior to 2003 list prices were published.

6.1. Container operations

Containers carry medium and high value cargo. Containerisation of seaborne cargo formally in break-bulk form has driven the rate of growth in container traffic at twice the rate of growth in trade. Thus because of the ubiquitousness of containers, importance for world merchandise trade and their comparability across ports, container operations are closely monitored.

Container terminals are generally purpose build terminals with sufficient draft at the berth for large vessels and large open areas for storing containers waiting for loading or having been discharged awaiting collection or onward dispatch on a different vessel (transshipment). Container ships are purpose built to carry containers in rows. Ship to shore gantry cranes with sufficient reach across the ships beam handle the loading and discharge of the containers. Container operations also involves the organisation, storage and movement of boxes in the container yard, receipt from shippers' transport operator, delivery to transport operators for onward movement by rail and truck and information systems to track the movement of boxes and optimise their loading sequence on a container ship.

6.1.1. Container terminal handling charges

Container handling charges are set per move per class of container (minor variations for dry, non-hazardous, hazardous, out of gauge and reefer boxes) and are the same for imports and exports.

Rates for the three deep-sea container terminals are identical.

SAPO charges different, lower, rates for handling of container at multi-purpose terminals and differentiates between ports. Prices charged to different customers in the form of the major lines may vary as a result of different contractual arrangements, however a survey of prices quoted by lines indicated SAPO charges a standard box rate across the board.

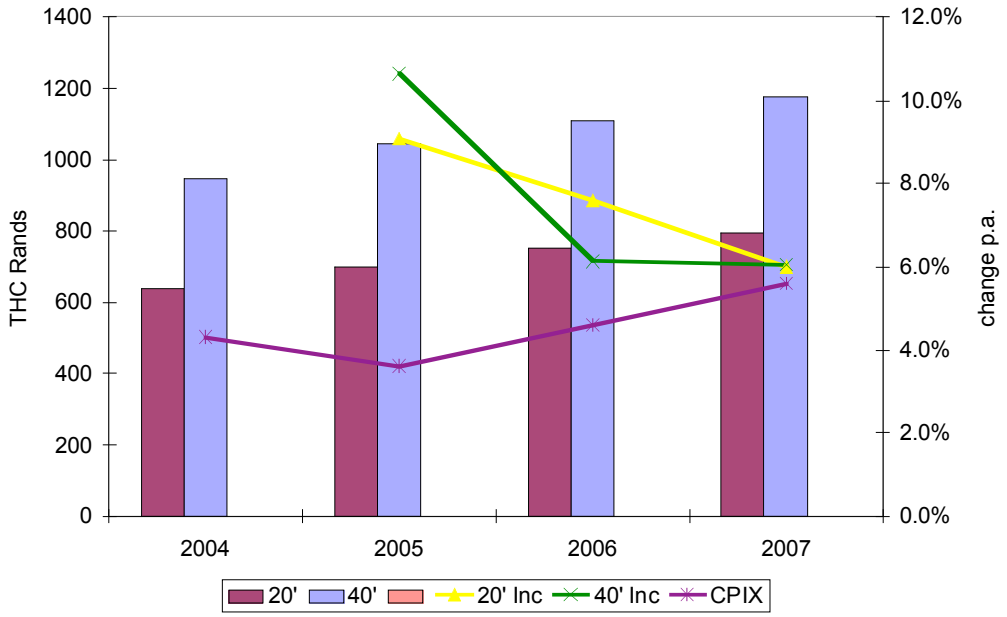
Table 15 – THC for non-hazardous container 2004-2006 (Rands)

Size	2004	2005	2006	2007
B20'	639	697	750	795
40'	944.5	1,045	1,109	1,176

Source: Freight industry interviews

In 2000 the THC for 20' and 40' containers at deep-sea terminals was R410 and R615 respectively. Between 2000 and 2003, SAPO increased container THC at a compound annual growth rate of 16% These aggressive price increases were made possible by the monopoly SAPO holds (on dedicated terminals), and most importantly, the conversion from wharfage to cargo dues undertaken by the port authority, which dropped substantially for high value cargo. Customers, one presumes, were prepared to accept the higher stevedoring charges during the tariff reform when overall port costs were declining. The rate of price increases for container THC has slowed since 2002. In 2007 the increase was 6%, probably around the full-year CPIX increase.

Figure 9 – THC for 20' and 40' boxes and annual percentage increases 2004-2007



Source: Freight industry interviews

6.1.2. Container terminal productivity

Container crane move rates are the single most monitored measure of container terminal productivity because of the comparability of container handling operations between terminals and between ports. Because all container terminals handle identical units (standard sized containers) benchmarking is superficially easy and suggests that universal comparisons can be made. Unfortunately container terminal productivity cannot be easily compared due to the large number of variables that distinguish one

port from another. Significant distinguishing features include, amongst others, the following factors:

- Type of terminal, feedering or hub;
- Trades served, lines on schedules or non-scheduled vessels
- Mix of container type, imports, exports full or partial loads, reefers, transhipments and empties;
- Yard density, IT systems for ship plans and tracking and yard transport and storage equipment choices. South African container terminals operate straddle carriers due their relatively low utilisation rates and small parcel size. Other yard control systems using rubber tired gantries and dray trucks are used in denser, larger and by comparison with South Africa, more productive ports. The redevelopment of Durban's pier 1 as a container terminal is understood to be designed to use a high density rubber tired gantry handling system.
- Crane type and condition. Container crane productivity measured by moves per hour is an accurate measure of waterfront productivity as all cranes classified by vessel size (post-panamax, super-panamax) are similar. Age differences between cranes in a well-run port should not greatly affect productivity, as current generation control and motor drive systems should be retro-fitted to older equipment to raise its productivity before it is replaced with current generation equipment.

Container moves per hour in South African container terminals is a subject of intense interest to shippers, agents, lines and the port business community. Congestion in South African ports is not attributable to poor container terminal productivity alone, for as will be shown below marine services are frequently the cause of vessel delays. Productivity measures are provided to SAPO's customers and the consultative forums with the main trades. Transnet's refusal to provide data for this study prevents a time series presentation of container crane moves and with it an assessment of productivity that takes the seasonal traffic through terminal into account. Moreover, the practice of SAPO providing monthly productivity figures to the public has been discontinued, consistent with a general obscuring of Transnet operations to public scrutiny. Spoornet last published a detailed divisional report in 2003, a practice that has been discontinued with the dissolution by Transnet of divisional boards.

An analysis of crane moves at Durban Container Terminal using point data collected for the purpose, the salient points are shown in Table 16, revealed the following indications of terminal productivity.

1. Actual performance per crane differed by 100%. The mean actual lifts achieved per hour cycle for working cranes was ten moves and twenty moves each;
2. Mean moves per hour per working crane after eliminating idle time was a more respectable 17 and 24 lifts;
3. Average moves per ship hour served by two working cranes was 30 lifts;
4. Of the average of three cranes boomed down and positioned for operation per vessel only two were in service at any time which indicates that SAPO container terminals are equipped with sufficient cranes, or more seriously, underutilise capital equipment with poor crane deployment;
5. Working cranes returned a mean lift cycle time of 106.4 seconds with a standard deviation of 16.4 seconds. The equipment showed it was capable of a lift rate of between 29 and 40 moves per hour, that is 50% to 100% better than the actual mean hourly lift rate;
6. Crane repositioning on the quay with no resultant working of container row (data not shown in Table 16).

From the above indications the following conclusions can be reached regarding terminal productivity:

1. Terminals productivity is not constrained by equipment shortages. This conclusion directly contradicts the diagnosis of low port (and rail) productivity due to a shortage of equipment as a result of inherited deferred investment to maintain, replace and expand transport infrastructure within the Transnet group as a whole.
2. Workflow is uneven, resulting in considerable crane idle time. No data was obtained regarding yard organisation therefore it is not possible to identify the causes, yet the symptoms manifest in container stevedoring suggest that the yard workflow is broken and operations are unable to pull boxes evenly from the stack and place discharged boxes efficiently in vacant slots.
3. Operations planning is defective. It is unknown whether the problems of incorrect crane repositioning are due to operator error, communication or IT system failure or some other cause, however, the result adds to idle time and reduces terminal productivity.

A comprehensive analysis of the entire terminal operations including yard operations would of course need to be conducted in order to confirm, quantify and design solutions to the problems identified.

Transnet's turn around strategy provides grounds for optimism. The problems identified in this study are amenable to correction by restructuring and process re-engineering. Transnet's turn around efforts are directed at remedying these problems. Improvements to the asset base through new capital investments will also assist to boost efficiency.

SAPO currently operates with eleven stevedore gangs on the DCT yet it has one and a half times as many cranes (interview[l]). Terminal productivity would thus appear to be constrained by three inter-related factors: low labour productivity, sub-optimal deployment of labour and poor communication and control of workflow.

Table 16 – Analysis of crane productivity Durban Container Terminal (moves per hour)

	Actual	Full utilisation	Average / ship working hour	Per crane full utilisation range minimum	Per crane full utilisation range maximum
Crane 1	10	17.1	30	29	40
Crane 2	20	23.5			
Crane 3	0				

Source: Author's measurements

6.2. Break-bulk operations

Pricing information is not available for break-bulk operations operated by SAPO for this study. Motorcar stevedoring operations have been examined, since these form an important segment of the break-bulk operations of South African ports.

Current operational performance of South African car terminals has been assessed by the Automotive Industry Development Centre (AIDC). These results are shown in Table 17 below. Benchmarking between terminals is complicated by physical factors such as terminal lay out, distance vehicles are driven, safety procedures that affect loading rates such as the number of vehicles permitted on a vessel ramp at a time that

differs between ships and their operators. Such factors affect roll-on roll-off stevedoring performance, moreover, some are not under the control of the terminal operator (interview[p]). In short the results of the AIDC need to be approached with caution. This survey show Port Elizabeth and Durban ranked 6th and 7th respectively out of 11 in terms of the loading rates they returned. Terminal performance measured by vessel turn around time, the key measure of performance for vessel operators was just under the mean for Port Elizabeth but ranked bottom for Durban. Poor performance was due to delays with Durban marine services, not due to SAPO stevedoring.

Table 17 – Benchmarking of South African and international car terminal time to complete operations (hours)

Port	Pilot on board to berth	Set up	Loading rate	Ship ready wait for pilot to board	Total time
Taichung	0.75	0.58	2.50	0.83	2.17
Bremerhaven	1.30	0.50	1.67	0.75	2.55
Le Havre	1.20	0.67	1.33	0.83	2.70
Antwerp	1.20	0.75	1.67	1.00	2.95
Singapore	2.00	0.00	1.00	1.00	3.00
Port Elizabeth	1.00	1.25	1.72	1.41	3.66
Mean value	1.88	0.65	1.84	1.26	3.79
Yokohama	2.50	0.50	1.42	1.00	4.00
Chiba	3.00	0.50	2.92	1.00	4.50
Toyohashi	3.00	0.50	2.92	1.00	4.50
Nagoya	3.50	0.50	1.42	1.00	5.00
Durban	1.28	1.37	1.68	3.98	6.63

Source: AIDC, 2007

6.3. Bulk operations

Pricing of bulk materials handling contracts between shippers and SAPO are based on volumes and material characteristics and as such are commercially confidential to the parties. In order to observe the prices of an important category of bulk cargo, users were consulted. The following price and performance information refers to a mineral commodity in the top 10 export category that is classified as dry bulk.

6.3.1. Bulk operation prices

Bulk handling prices for 2007 range from R40 to R50 per ton. Contracts prices vary between shippers handling the same cargo in relation to their annual tonnages. High volume producers are able to secure prices at the bottom of the range for all their cargo handled under an annual contract (interview[o]).

6.3.2. Bulk operation performance

Bulk handling of the commodity in question, not using bulk mechanical appliances, is conducted at South African port(s) and at the port of Maputo using similar stevedoring methods, in similar parcel sizes and into the same vessel types, i.e. it is truly comparable (interviews[n o]). The materials handling rates for the equipment set up and material type is given by the norm. The target rates are set by the operator at achievable objectives for the stevedoring gang and the same is reflected in the contract with the shipper. Mean rates are the recorded actual performance. The actual performance achieved by Maputo is higher than the target. South African operations actual performance is below the norm. How is this possible? Shipper do become

directly involved in operations, have their own staff involved in operations in an effort to improve performance, received performance monitoring reports from SAPO for each of their contracts. Actual performance shows despite the presumably good intentions of SAPO, co-operation from its customers to improve performance and use of consultants from time to time to diagnose problems and propose efficiency improvements, steps required to remove bottlenecks in operations are not being taken.

Table 18 – Bulk-handling rates South African terminal compared to Maputo terminal (tons per hour)

South African terminal			Maputo terminal		
Norm	**Target**	**Mean**	**Norm**	**Target**	**Mean**
150	180	120	170	180	190

Source: Industry interviews

The same material discharged at a European port pays a rand equivalent stevedoring charge of R33 to R43 per ton. Handling methods used are not similar so the discharge rates at 400 t/ph using automated systems are not comparable. The fact remains nevertheless that the actual stevedoring rates are 14% to 18% cheaper (interview[o]).

7. South African port call costs and performance

To bring together several threads running through this study, the discussion presented in this section examines operational factors affecting port users, incentives, comparative costs of port calls and the impact of port costs on trade. Data supplied by shippers and port users has been drawn on for presentation and analysis in the section. Opinions expressed by sources are identified as such. It is appropriate to reiterate that the denial of access to NPA and SAPO means deductions made on the basis of these sources have not been subject to the "let both sides be heard" principle.

7.1. Delays

Ship operators feel port congestion most acutely, and are compelled to pass the cost of delays on to shippers in through congestion surcharges for tempory interruptions of service. In the long run such costs feed through to raise freight rates. South African ports are not alone in experiencing congestion; the good growth rates in seaborne trade have put pressure on many ports around the world. Durban is South Africa's busiest port, and experiences the higher congestion problems as a result. In the first quarter of 2007, inherent delays in Durban ran at 48 hours, rising to 72 to 92 hours on occasion. Average ship turn-around times for container trades for Durban and Cape Town for 2006 show the former averaged delays of 43 hours and the latter 20 hours over the year (interview[l]) (see Table 19). Over the same period, the port of Richards Bay averaged delays of 12 hours for vessels waiting to enter the port (interview[n]).

Table 19 – Average ship turn around time container trades Durban and Cape Town 2006 (hours)

Port	Ship working time	Port delay time	Total ship turn around time
Durban	40.7	42.8	83.5
Cape Town	23.5	20.3	43.8

Source: Industry data

Several factors cause delays to vessels. An analysis of the causes of delays affecting bulk shipping at the port of Richards Bay is provided in Table 20. The same results are graphically summarised in Figure 10.

Table 20 – Delay reasons affecting bulk shipping at Richards Bay port (days)

Delay reason	Total lost time	Avoidable	Incidence	Average lost time
No berth	34.545	Yes	22	1.57
No cargo	24.243	No	11	2.20
Weather	19.115	No	7	2.73
No cargo plan	6.891	Yes	4	1.72
Cleaning	11.246	No	3	3.74
Engine failure / other	2.807	No	2	1.40
ISPS clearance	2.258	No	2	1.12
No berthing crew	1.887	Yes	2	0.94
No gangs	0.715	Yes	1	0.71

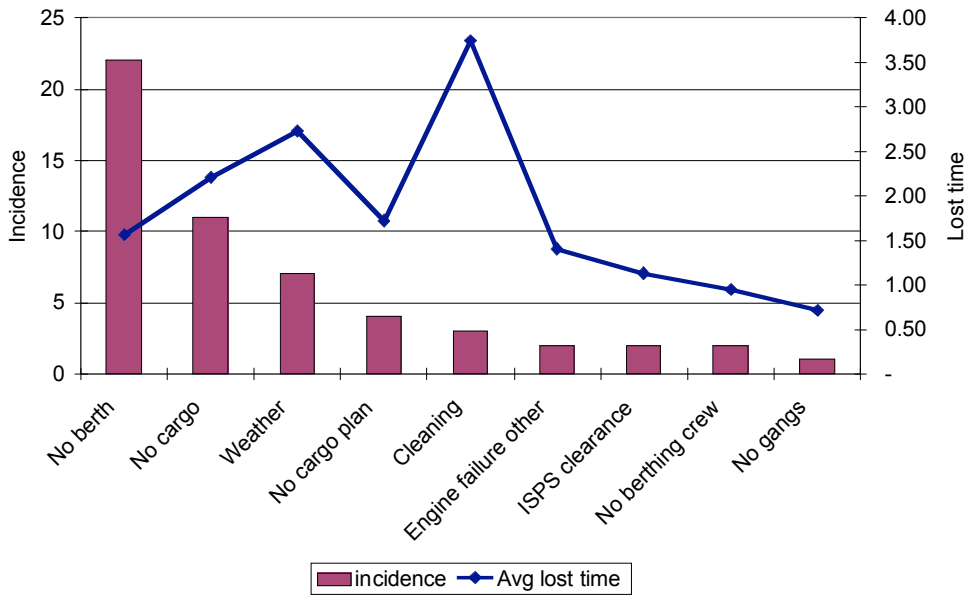
Source: Author's analysis of industry data

From the foregoing the following issues are important:

1. None availability of berths is the single most important factor, causing 40% of all delays and costing ship operators an average of 1.57 days of lost time. None availability of berths is the result of show ship turn around times, low berth productivity and the knock on effect of delays on later traffic down the line, which is predominantly a stevedoring problem.
2. None availability of cargo caused 20% of delays. Such a problem is outside of the control of NPA or SAPO.
3. Delays caused by breakdowns in NPA marine services (berthing crews) are isolated but add to the port congestion and are not to be confused with poor stevedore performance. Delays do to pilot non-availability is not infrequent problem (interviews k n).
4. Roughly 10% of delays are directly attributable to operations failure of no cargo plan or stevedore gangs.

Port users report considerable dissatisfaction with equipment breakdown and operational problems due to failures (interviews g k l n). Specific instances were cited and problems currently experienced contrasted with the previous practices, as in for example, the inability of bulk appliances to handle concurrent loading of different materials due to the risk of cross contamination. In some instances equipment that had aged was unable to conform to its original specifications and past performance. Unfortunately quantitative data on equipment performance maintained by SAPO was not made available to this study.

Figure 10 – Vessel delay factors incidence (no.) and average lost time (days)



Source: Author's analysis of industry data

7.2. Performance incentives

SAPO contracts with its clients include a premium service performance incentive for the operator to earn a 10% premium on its charges if it operates within a 5% variation around the stated norms for a premium service with a berthing window and guaranteed departure times. The value of such contractual incentives is unfortunately

nugatory. SAPO contracts do not penalise the operator for non-performance and thus, in the opinion of port users there is no value for clients to move their business onto such contract terms (interviews[l]).

Outside of the container trades shipping contracting practices have changed. In the past shipping lines typically contracted with clients as carriers with separate load terms agreed between the shipper and stevedore. Over time this practice was replaced by incorporating loading in the carrying contract between shipper and shipping lines, which was simpler to administer. Loading is conducted on a best-effort, no-penalty basis of Customary Quick Dispatch basis. This simpler system disadvantages ship owners who bare the costs of port delays on a charter and it is encouraging ship owners to revert to contracting to exclude loading terms for spot contracts to protect themselves from escalating port costs (interviews[n]).

7.3. Relative costs of port calls – South Africa and others compared

Shippers and ship operators consulted were asked to compare South African port costs with trading partner ports. These were the results:

1. A shipper selling primary products on a FOB South African port basis held the view that buys felt that South African ports were comparatively expensive when judged against others ports with a large trade such commodities. (interview[k]).
2. Data for aggregate port call costs for cargo exported from South Africa to ports in the Mediterranean indicates that the total cost of a port call has risen 40% from 25,000 USD average for a South African port call in 2004 to 35,000 to 45,000 USD in 2007. Costs for port calls where the cargo was loaded or discharged, i.e. equivalent ports ranged from 25,000 to 35,000 USD, that is 30% to 40% cheaper than South African ports (interview[n]). Total costs were being driven by higher charges and by delay/ lost time costs.
3. A port user consulted held the opinion that since 1997 South African port charges had moved from the second quartile of the cost curve for developing countries to the third quartile (interview[l]).

7.4. Impact of port costs and performance on trade

The impact of port costs on trade forms part of the rationale for the examination of administered prices that this report is examining. Port users consulted frequently cited the impact of higher port costs, both in terms of charges and in terms of the costs of delays as a factor that undermined South Africa's trade competitiveness.

The prima face case for high port costs undermining trade, particularly of South African manufactured exports is compelling. Port users and industry sources consulted stated in strongly held opinions that exports were being choked by port costs. Independently testing the relationship between port costs and trade, however, is beyond the scope of this study.

8. Pricing setting mandate and mechanism for ports

This section re-examines the legislative, institutional and governance framework for ports to analyse the price setting mandates for administered port services and operations.

8.1. Legislative lacunae

Transnet (Pty) Ltd operates without direct legislative guidance on pricing of its services in any way. Transnet operates as a major public entity listed in Schedule 2 of the Public Finance Management Act no. 1 of 1999. Its enabling legislation, the legal succession to the South African Transport Services Act (Act No. 9 of 1989), provides a price and service guides only for commuter rail services. It is silent on freight rail and port services. Legislation only puts a negative burden on Transnet – it is not to behave in a way that damages the economy. No positive burden of meeting economic goals is placed on Transnet. In particular, the strategic and economic goals of the Republic are to be furthered without derogating the provisions of section 15 (on commuter rail).

> *"17. Strategic or Economic Interests of Republic. – Without in any way derogating from the provisions of section 15, should the Company act in a manner contrary to the strategic or economic interests of the Republic of South Africa, the Minister may direct the Company, by means of a written notice or by any other means that he may deem desirable, to discontinue such activity within a reasonable period, which shall be stipulated in the notice or other means of communication employed" (RSA,1989: § 17).*

This implies that Transnet in the absence of guidance act at its own discretion, that is under the board of directors appointed by the government shareholder minister, to determine its own pricing structure. As long as its actions are at least neutral for the strategic and economic interests of the country, it is free to act. No parameters are set for pricing or service levels of commercial operations, nor is any limit set to the cross subsidization of different modes, or the application of revenue from operations to cover group pension liabilities and debt obligations.

Cargo dues and its predecessor wharfage are core revenue contributors to the port authority making up two thirds of Transnet's maritime segment operating profits. Transnet's post finance operating profit margins for the maritime sector averaged 36% between for the decade to 2006 (see appendix 4). So significant is this segment to the financial health of Transnet structural reform ring fencing port revenues or effecting a separation of the port authority from Transnet is unlikely to materialise.

8.2. Shareholder governance

Transnet's board has been given a mandate by the shareholder minister in the form of compact confirming the company's mandate and recording strategic objectives to be attained by Transnet for the given period. The first shareholder compact for 2006/07 was confirmed on 6 October 2006. Its terms endure and provide for renegotiation once per annum.

The shareholder's compact confirms that:

> *"The underlying mandate for Transnet remains as determined by the company's founding documents, by prevailing legislation and by this compact.*
> *Transnet's key role is to assist in lowering the cost of business in South Africa and enabling economic growth through providing appropriate ports, rail and pipeline infrastructure and operations in a cost effective and efficient manner and within acceptable benchmark standards." (DPE, 2006:5)*

Four strategic objectives are recorded, namely capital and financial efficiency, operational efficiency and effectiveness, infrastructure investments and development objectives. A fuller discussion of the shareholder compact is contained in the companion report on rail.

Mandates for pricing of port services and operations (for the 1 April 2006 tariff period) were set out as follows.

Table 21 – Performance indicators for Transnet total revenue increase 2006/07 (core businesses)

	Total core businesses	Spoornet	NPA	SAPO	Petronet	Transwerk
Tariff (%)	3.3	3.1	2.9	3.9	2.0	4.3
Volume / Activity (%)	11.5	10.9	3.7	8.8	6.8	28.6
Total revenue increase (%) (internal plus external)	15.2	14.3	6.7	13.0	8.9	34.1

Source: DPE 2006:10

Armed with the above pricing mandates it is possible to assess conformity by NPA and SAPO. But first it is useful to comment on the mechanism through which prices are adjusted.

8.3. Price setting mechanisms and pricing conduct

Customers experience of price adjustments must to a certain extent be discounted, therefore to screen subjective views the following comments obtained from industry consultation, capture points that were corroborated by more than one port user.

1. Ship charter rates and annual contracts are normally set to run from January to December. NPA adjusts its tariffs on 1 April so users have to accommodate prices changes after their main contracts have been settled.
2. The basis on which tariff adjustments were being made was not substantiated to users. No examples of satisfactory disclosures of investment, rates of return and productivity enhancements to back up port costs for both services and operations could be identified.
3. Details of investment plans for expansion or refurbishment against which charges were being raised were not satisfactorily communicated to users in terms of the level of detail provided and credibility. Plans, once announced had been replaced on several occasions.
4. NPA tariff setting is performed unilaterally through an announcement from the authority of rates imposed on customers.
5. SAPO contract adjustments are negotiated with clients and tended to settle on terms with minor adjustments to the offered rates.

6. Price adjustments, downwards, had been known to be made by the Port Authority when users identified an error in the tariffs.

8.3.1. Port Authority tariff increases

An examination of the pricing mandate for Transnet set out in Table 21 with the annual percentage change for cargo dues, (selected for it 70% weight in NPA tariffs) shown in Table 14 reveals indicates that NPA tariff increases exceed the limits set by the shareholder. Cargo Dues increased by 4.3% against a tariff mandate of 2.9%. The same conclusion would be arrived at with respect to the tariff increases set for SAPO for 2006 of 3.9%. Using the annual increase applied to 20' and 40' containers (significant prices in the basket of SAPO charges) of 7.6% and 6.1% respectively such increases far exceed the 3.9% tariff mandate.

NPA customers were informed of the 2007 price adjustments by customary circular letter from the NPA chief financial officer, Mr. M. Abdool on 26 February 2007 announced that adjustments to the service categories for would be set at an increase of 4.5% for cargo dues and an increase of 5.6% for all other services. The letter further stated that "the tariff adjustment for 2007/08 have been limited to a maximum of the forecast CPIX of 5.6%, and that across the entire port system, the net average tariff increase equates to just 3.5%".

In reply to a written enquiry from the author Mr. K. Kanjee from the port authority provided the following explanation for the discrepancy. Contractual agreements in place with high volume customers will impose lower increases than set out in the tariff book. The combined effect of discounting from the tariff book is such that the price increase with effect from 1 April 2007 would result in an actual increase for port users as a whole of 3.5%

Two observations can be made:

1. None of the small sample of port users consulted in this study had correctly interpreted the port authority tariff increases and in the main felt aggrieved by the unilateral increases imposed.
2. Without in any way derogating from the explanation provided by the authority one South African company, a Fortune 500 entity trading in top 10 export categories confirmed that the prices it paid for port services conformed to the rates given in the official tariff book (interview[i]).

8.4. Bargaining power of customers

Industry sources consulted indicated their bargaining power in relation to Transnet's presence in port services, operations and rail is circumscribed and this consequently profoundly shapes their behaviour. Notably:

1. Some companies have adopted a company policy to deal directly with Transnet and its divisions only through formal bilateral communication protocols. No communication or disclosures will be made to third parties or the press (interviews [m-q]).
2. On port performance issues such as port congestion, surcharges imposed on container traffic, or other matters related to services for which the press seeks industry comment company policy refuse to make any statements or provide comment (interviews [m-q]).
3. Freight operators and port users broadly confront Transnet as group owner, de facto regulator, monopoly service provider and competitor in various

permutations as they conduct their business. Port users variously conduct their business as services providers in the freight market where they are reliant on the port authority, both compete with SAPO in some markets and use it as a service provider. Port users also use Spoornet as the only service provider for rail. In short , Transnet divisions impact on most pricing and service provision aspects of their business. The subsuming of the port authority within the freight services holding company of Transnet and the absence of competition to SAPO at a container terminal level fundamentally constrains the performance of South African ports by effectively negating competition in port operations.

4. It is the opinion of port users that any company openly critical of Transnet or its divisions is victimised (interviews l m). It is noted that specific instances of victimisation were not cited.
5. The greater the degree of dependence on Transnet divisions the greater the strategic imperative for the firm to abstain from criticism.
6. Port users with a choice of either transport modes not controlled by Transnet, (road) or alternative port options (Maputo or Walvis Bay) or both appeared to have greater bargaining power and independence from Transnet (interviews h i o).

It would thus appear that port users are highly depended on the sole provision of services by the port authority, SAPO or Spoornet and importantly feel they are susceptible to victimisation or sanctions if they object publicly pricing behaviour and to poor performance. The existence of consultation forums between port authorities and port users are noted as structures that are used to cooperate to address common performance issues, however, such bodies do not deal with pricing matters. Without alternative service providers, port users appear to feel they are both without voice and channels for redress. Such conditions indicate that the Ports Regulator provided for in the National Ports Act will have a difficult task to convince port users that the regulation it proposes to oversee will improve the situation.

9. Port pricing and performance in comparator countries

Comparisons of port costs between SA and ports where SA goods are loaded or discharged have been made whenever possible in this report. What follows is a comparison of port costs in the container trades and an summary of the port pricing practices of Australia, Brazil and Western Europe.

Country comparisons provide a quick but often crude way of throwing local practices open to scrutiny and to highlight price and performance discrepancies, however the underlying causes of divergence may not be so readily apparent. Comparison countries have been selected to take into account the following:

1. Middle-income developing country status in the case of Brazil;
2. Traffic pattern similarities with Australia; and
3. Share of traffic originating and terminating in Western Europe, the substantial differences in volumes and institutional arrangements notwithstanding.

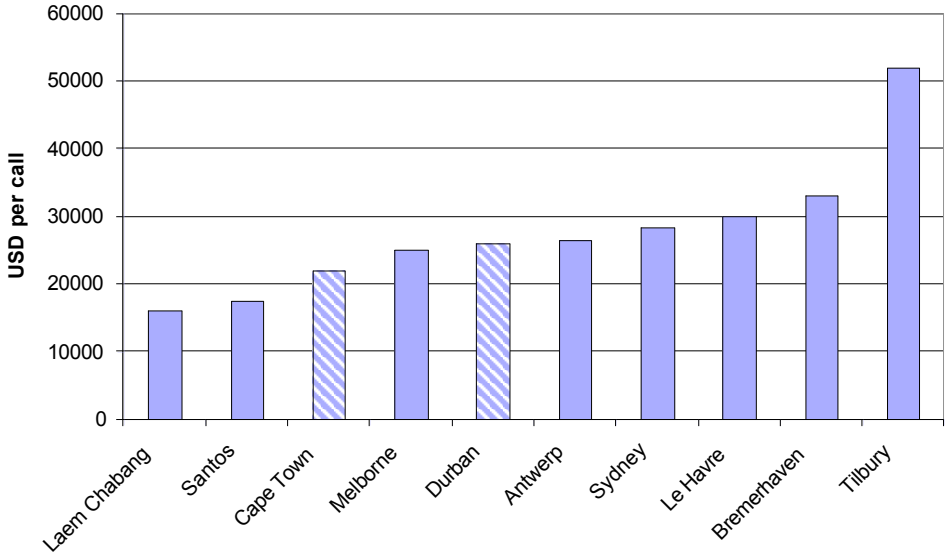
9.1. Comparisons of container handling

The intense scrutiny of container terminal performance, ease of comparability and availability of data makes container terminal performance our starting point. For this study information has been obtained (interview[p]) from a container shipping line handling trade in the ports listed.

1. Port call costs were collected to aggregate marine service charges and infrastructure charges. Port stay times or delays were not allocated an imputed value from charter rates;
2. Costs obtained were valid for late 2006 early 2007;
3. All costs were converted from US Dollars at a rand exchange rate of R7.5 per USD; and
4. Ports in North America with substantially higher costs have not been included due to the little direct trade between SA and USA and Canadian ports.

Results for the container vessel port call costs show that on a per call basis, Port of Santos in Brazil is less expensive that South African ports. European ports as a whole are all more expensive that South Africa.

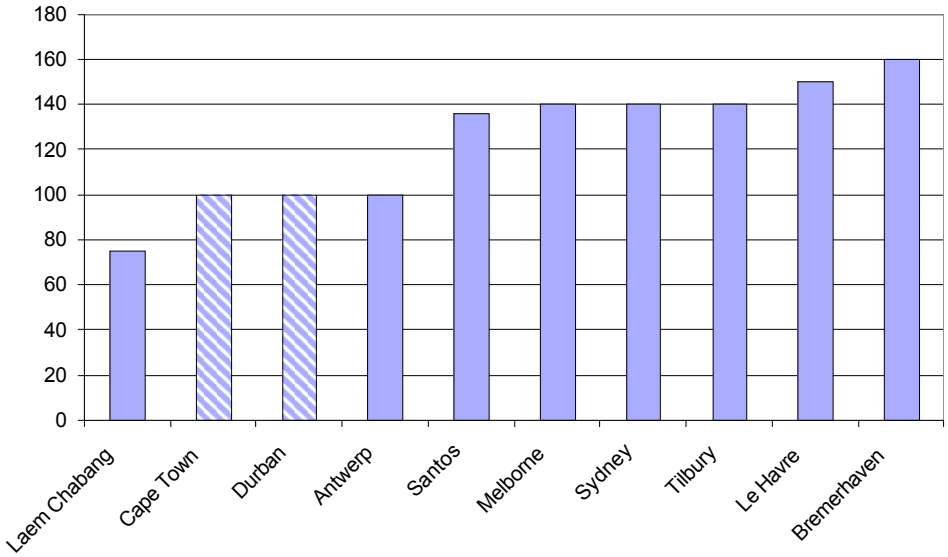
Figure 11 – Container vessel port call costs, 2007 (USD)



Source: Shipping industry data

Cargo handling costs for a 20' are shown below. Terminal handling charges form the largest part of the combined (infrastructure and handling) costs of moving cargo through a port. In this respect South African ports in the bottom quartile of the sample having higher THC than only Laem Chahang. South African ports have lower THCs than all the other Australian and Western European ports examined.

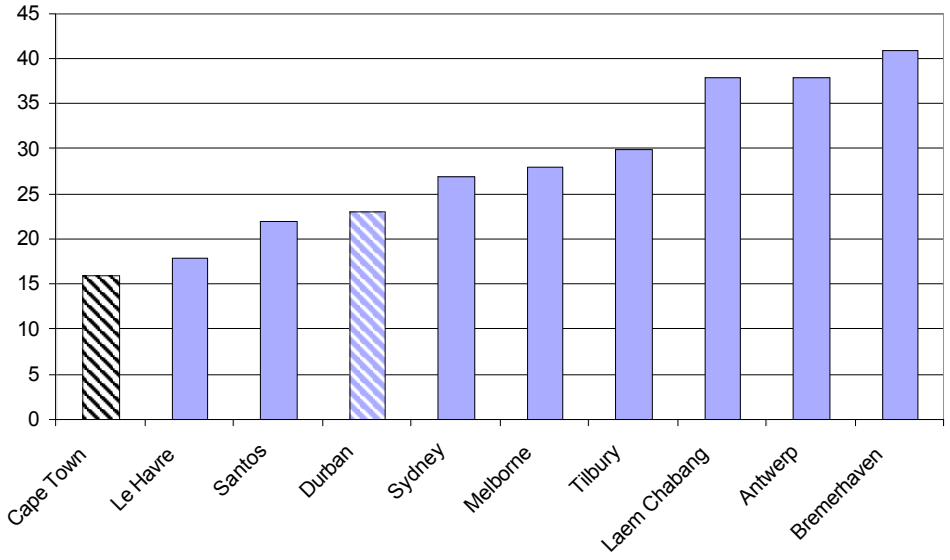
Figure 12 – Container THC per port, 2007 (USD)



Source: Shipping industry data

South African ports fall into the lower third of the rankings for gross crane productivity in moves per hour. Comparability, however, falls off in relation to the more automated systems used for ground movement of containers in Bremerhaven.

Figure 13 – Container crane productivity (moves per hour)



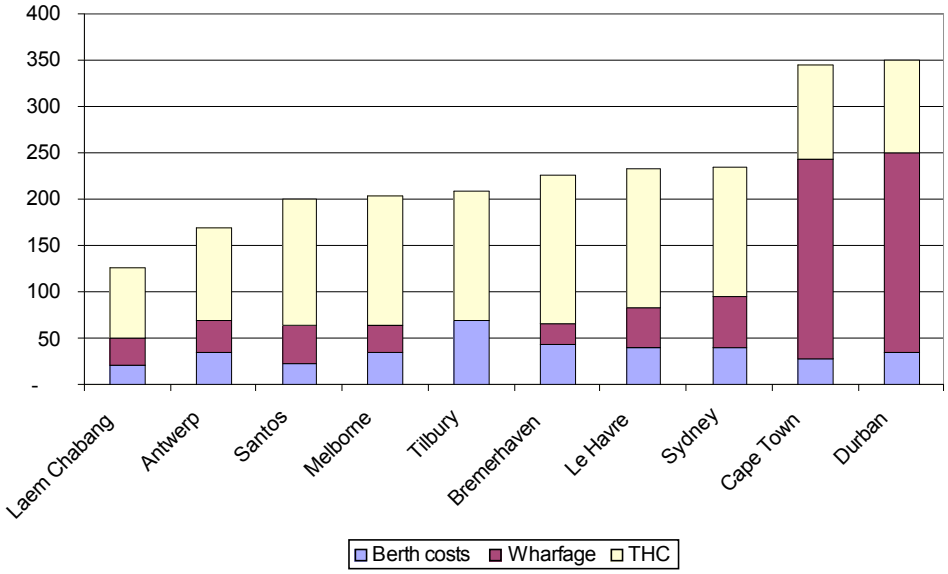
Source: Shipping industry data

Converting the given costs onto a per TEU basis reveals the anomaly in South African port – the excessive share of wharfage collected on cargo contrasted to other ports. The following must be noted:

1. All port costs have been subject to a parcel size of 700 containers. This is representative of SA port traffic but far fewer than would be handled in the larger Asian and Western European ports.
2. Pricing for wharfage varies between ports. Tilbury, a private port does not charge wharfage, there the infrastructure charge is incorporated into the THC.

South African ports practice of strategic pricing for wharfage, now cargo dues, at a rate that exceeds the ratio of wharfage in combined port prices for the ports listed below by a factor of five puts the handling costs per TEU into first place in the sample. On a container operations basis (see Figure 12) South Africa is mid-priced.

Figure 14 – Total port and handling costs per TEU (USD)



Source: Shipping industry data (SA wharfage at import rate)

9.2. Australia

Australia is a major exporter of bulk commodities and the distribution and role of ports reflect this. Minerals and bulk agricultural produce are shipped through ports located near the source of the goods. Some of these regional bulk ports are among the world's largest. Newcastle, New South Wales (coal), Haypoint, Queensland (coal), and Port Hedland, Western Australia (iron ore) are Australia's largest in terms of volumes exported, each handling around 70 million tons per year of bulk commodities, on a par with Richards Bay.

Container ports, which are small by world standards, are the countries largest ports measured in terms of the value of goods passing through. These are the East Coast ports of Melbourne, Sydney and Brisbane. Manufactured goods, containerized for transportation, are produced in the major metropolitan centers. The large city ports handle a greater variety of cargos than the regional bulk-handling ports, and the majority of imports and exports (in value terms).

Australia has 97 appointed ports, as defined under Section 15 of the Customs Act, by which the Australian Attorney General's Department may nominate ports through publication in the Government Gazette. Western Australia has 22, Queensland 20, South Australia 18, Tasmania 15, New South Wales 14, Victoria 5 and the Northern Territory 3. For the most part, Australian ports were developed before the establishment of the Australian Federation in 1901. Control was subsequently transferred to individual state governments, with the federal government retaining constitutional powers over areas of national interest. The result is a mix of public and privately- owned and managed ports. Australian governments have adopted the landlord model in the main for major, multi cargo port. The seaports of Melbourne, Sydney, Brisbane, and Sydney airport are the largest ports, each handling substantial values of both exports and imports. Other ports with significant throughput include Gladstone, Queensland, and Fremantle, Western Australia (IBR, 2003). With the exception of Freemantle which offers pilotage, private service providers provide marine and stevedoring services.

Following decades of inefficiency with highly restrictive labour practices port reform kicked off with the Webber Commission report of 1986. During the 1990s a number of industry inquiries were undertaken with the involvement of the Australian Industry Commission. Given the importance of port operations to the Australian economy, waterfront reform remained high on the microeconomic reform agenda of the 1990s. Over time, port operators have implemented most of the Industry Commission recommendations to improve efficiency, resulting in reduced charges to ship owners and shippers of cargo. As a consequence of the reform process, employment has declined at Australian ports, due mainly to changes in work practices, withdrawal by port authorities from non-core activities, outsourcing, changes in technology, and improved management which has resulted in major performance improvements (IBR, 2003).

Australian ports generally operate as corporatised statutory authorities or as commercialised statutory authorities and enabling legislation sets out a broad mandate. Key features of the environment in which pricing in Australian ports is set, drawn from the Productivity Commission (1998) are the following:

1. Port authorities are subject to the same competition principles as private businesses;
2. State governments competition authorities exercise price regulation over the major landlord ports serving the major cities, via offices of regulator or ministerial approval of port fees and charges. Queensland, New South Wales and Victoria have competition authorities that set port pricing orders;
3. Pricing practices followed by ports are to recover direct costs and overheads;
4. Adelaide, Brisbane, Fremantle and Melbourne aim to fully recover costs and generate profits according to normal commercial business principles;
5. The Sydney Ports Corporation lists competitive rates along with trade maximization and efficient port usage as factors to consider in price setting.

Price and performance monitoring of Australian ports and the dissemination of the results into the public domain is, as far as could by found by this study, unique. Over three decades of scrutiny of port performance has given rise to a comprehensive port price indexing by the Bureau of Transport and Regional Economics, a division of the Commonwealth Department of Transport and Regional Services. A significant recent development has been the introduction of a set of performance indicators for the landside of port terminals (BTRE, 2006) that deserves examination as a tool for monitoring port performance in South Africa. Australian ports are far from being models to emulate, however, as the bulk ports in particular exhibit severe congestion problems.

9.3. Brazil

Brazil initiated reforms in the transport sectors starting in 1994 to replace is role as an operator into becoming a controlling and regulating agency. The need for reform was driven by the need to attract investment to modernize the port facilities and to offset the negative trade balance. The federal government to made changes in the so-called centralized PORTOBRÁS System - Brazilian Port System. The changes came with the implementation of the Law 8.630 - the Port Modernization Law, which settled the legal issues regarding the operation of port facilities by private enterprises. The Brazilian government went from a service provider to a regulator, granting concessions, focusing on promotion and inspection of port operations.

Under the Port Modernization Law a Port Authority Council was established and a ownerships of ports transferred to state or city governments. Federal supervision has

been maintained. Restrictive labour practices were done away with. Port reform entailed decentralization. Concessioning was done on terms to encourage investment and social protections were given to port workers made redundant by the changes.

The results of the reform were impressive given the costly and inefficient starting point that prevailed prior to reform. According to the Brazilian Association of Port Terminals three years after the Law 8,630 went into effect, the average cost of handling containers, was reduced from a range of US$400 to US$500 in 1997, to US$170 to US$230 in 2000 (IBS 2003b). Results from this study estimate the per container cost at some US$200.

Brazil's ports suffer with poor hinterland connections, land side congestion and have little or no expansion options due to encroachment by the cities. Sea and river conditions mean ports require constant dredging. Reforms initiated under the Port Modernization Law notwithstanding, port users identify the need for improved port administration and regulatory agencies with mandates to run ports on commercial lines as well, encouraging investment into the ports and structuring private-public partnerships.

9.4. Europe

Port pricing in the European Union has been the subject of a protracted battle between the European Commission and established economic interests favoring the status quo. What is striking about this situation is that it has exposed precisely how far port pricing in practice departs from cost recovery. Moreover the defeat of the European Commission directive on market access to port services in 2006 shows how difficult it is to achieve reform in the ports sector.

The EC directive in the main sought to introduce increased market access to port services and bring about a greater degree of uniformity in port financing and pricing. Analysis of the directive suggested that, if implemented, it was likely to generate unintended consequences that would not foster greater competition, transparency and investment in infrastructure it sought to achieve (Farrell, 2001). Incumbent port operators and trade unions condemned the proposals as too rigid and inflexible. However, the depth of the opposition it generated according to Haralambides et. al. (2001) was the challenge it posed to the deep seated judicial and cultural traditions where pricing practices of cost recovery confronted sub-national institutional settings on pricing and financing and sub-national political decision making directing ports to achieve broader policy goals.

Events in some ways overtook the EC directive as European ports have become much more competitive and productive since 2001, especially in comparison to the high cost structure US and Japanese ports. The retention of the status quo with respect to the institutional frameworks for ports in the EU does not prove ports are different and deserve special treatment, only that reforms have to be crafted on economic and political lines that generate change in a complex and highly heterogeneous environment. For port users and European consumers in general inter-port competition is effective. Ports compete vigorously in a wide transport services market without the need for regulation due to the existence of effective inter-port competition.

10. Conclusions and recommendations

Prices for port services and operations taken in isolation or when compared to prices in other ports place South Africa in the middle of a range of comparator countries. Productivity performances for container handling and bulk loading suggest that South Africa's waterfront has room for improvement. Yet what really marks South Africa apart is the size of the share of charges on cargo. Wharfage, now cargo dues, is raised at a level far in excess of the justifiable contribution cargo makes to pay for port infrastructure.

South African port authorities practice a form of strategic pricing determined by factors external to the cost and financing requirements of ports. The pricing principles underlying the largest component of port charges are revenue targets set by the holding entity. Strategic port pricing is opaque, distortionary, harmful to trade, contrary to the stated objectives of the National Freight and Logistics Strategy and governments overall desire to lower the costs of doing business. Strategic port pricing should be phased out completely.

Data gathered in this study confirms earlier studies that arrived at these conclusions for periods prior to and during the tariff reform period of 2001 to 2003. Possibly the most significant aspect these results indicate how the institutional framework of the state owned transport system that determine port prices is impervious to change, in spite of explicit tariff reform between 2001 and 2003 and declarations in corporate mission statements to meeting the country's logistics needs. Once again as this study has shown that the historical context and institutional arrangements for ports all over the world are highly influential in determining how port authorities actually go about setting prices.

Official policy for South African ports is cognisant of these problems. It see the solution as being found in the form of a port authority that is subject to regulation by an Ports Regulator. The efficacy of regulation can only be judged after the Ports Regulator is established and has had the chance to build up some institutional presence within the port market place.

Port users are understandably expectant that the port regulator will improve pricing efficiency within South African ports. Given the importance that waterfront performance plays in achieving Asgisa goals, there are wider expectations of improvements flowing from the establishment of the port regulator. The establishment of a port regulator will be a significant step in the institutional arrangements for South African ports. However, the basic structure of the market will remain unaltered. Moreover the control of the port authority and a substantial share of the port operations activity by Transnet implacably negates the market structure principles of a landlord port architecture.

Ports that are leaders in pricing and performance measures around the world are in countries where there is no regulatory body, or if it does exist it has exercised minimal intervention. These ports are located in regions characterised by a high degree of port competition. The implications for administered pricing in South Africa ports from this body of world experience is the critical requirement for government to accept the practical necessity for intra and inter port competition and carry it through into the institutional structure implied by the objects of the National Ports Act.

Given the strategic importance of the ports, rapid progress is required. It is suggested that an immediate step towards better pricing of port services might be made if the diversion of revenue raised within the ports were subjected to close scrutiny. This could be achieved immediately through comprehensive segment financial reporting by Transnet. This would perhaps prompt authorities to give attention to designing a different method for financing the transport operations currently housed in Transnet and until this financing issue is confronted directly port pricing will be held captive to needs of non-port entities.

Limited access to information was a major problem for this study. The response of industry participants to divulging information are symptoms of low trust and frustration between the players in the port system. Such conditions create major challenges for the Ports Regulator. It is therefore recommended that price and performance indicators be collected and made public by the Department of Transport for the purposes of establishing an information basis for monitoring the South African waterfront.

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Interview[a] to interview[q] conducted between 24 October 2006 and 22 March 2007.

Appendix 1 – Overview of cargo handled through South African ports

An overview of the eight commercial ports administered by the National Ports Authority is provided here. The Port of Ngqura is under construction and has not been commissioned, therefore it is omitted from this overview. Terminals operated by SAPO and falling under the remit of this investigation are described where information has been made available.

Port of Richards Bay 28°48'S 32°03'E

Richards Bay, a deep-water port with a large port estate and a land surface area of 2,157 hectares, is South Africa's primary port by cargo volume. Commercial shipping is handled at five terminals on three quays: Die Duine, Umhlatuzi and Bayview. SAPO operates the bulk and multi-purpose terminals. Major private sector terminals are Richards Bay Coal Terminal, Island View Storage, Richards Bay Bunker Terminal, Fedmis (Phosphoric Acid Installation) and Strang Rennies Metal.

Table 22 – Cargo handled at port of Richards Bay, 2006 (metric tons except containers)

	Landed	Shipped
Bulk	6,137,418	75,247,420
Break bulk	130,917	130,917
Containers (TEU)	1,376	2,815
Total cargo	6,268,335	80,050,728
Total cargo handled		86,319,200

Richards Bay bulk terminal

Typical cargoes

Bulk appliances transport loose, crushed and sized, fragmented or pellitised materials such as alumina, andalusite, anthracite, chrome ore, chrome sand, clay, coking coal, copper concentrate, ferro-alloy fines, fertiliser, metallurgical coke, nickel concentrates, petroleum coke, potash, rock phosphate, rutile, salt, sulphur, titanium slag, urea, vanadium slag, vermiculite, woodchips, wood pellets, zinc concentrates, and zircon

Throughput

12 Mtpa (being upgraded to 18 Mtpa)

Richards Bay multi-purpose terminal

Typical cargoes

Aluminium, containers, ferro-alloys, forest products, general cargo, granite, loose bulk, pig iron, pitch coke, project cargo, steel and steel scrap.

Throughput

5.6 Mtpa

Port of Durban 29°52'S 31°02'E

The port of Durban is South Africa's main general cargo commercial port and handles the majority of the country's container traffic and petroleum imports. The land portion of the port estate comprises 962 hectares and is hemmed in by the city of Durban. Commercial shipping is handled at the following quays: City, Point and T-jetty, Pier 1 (converted from multi purpose to containers), Cross Berth, Pier 2, Island View, Bluff, Bay Head, Maydon Wharf. The Port of Durban has depth restrictions with a maximum depth draft on the container terminal of 11.1 metres to 12.3 meters. SAPO operates the Car terminal, Container terminal, Pier 1, City Terminals, Point Multi-purpose terminals Point and Maydon Wharf Multi-purpose. Major private sector terminals are the Sugar Terminal, Island View, SACD, Bidfreight, Bluff Mechnical Appliance and outside of the port the single buoy mooring petroleum terminal.

Table 23 – Cargo handled at port of Durban, 2006 (metric tons except containers)

	Landed	Shipped
Bulk	28,580,245	7,140,512
Break bulk	4,312,182	3,532,882
Containers (TEU)	1,095,911	1,102,689
Total cargo	32,892,427	10,673,394
Total cargo handled		43,861,241

Durban car terminal

Typical cargoes

New and used motor vehicles and smaller quantities of other rubber-tyred vehicles such as heavy trucks, agricultural machinery and earthmoving machinery

Durban container terminal

Typical cargoes

20' and 40' containers, with a small number of 45' containers

Throughput

1.5-million TEUs per year

Durban Point multi-purpose terminal

Typical cargoes

Containers
Ferro manganese
Fruit
Grain and grain products
Granite and granite products
Maize and maize products
Malt and malt products
Manganese ore
Paper and paper products
Project cargo including heavy machinery and earth-moving equipment
Rice
Steel plates, coils, billets, slabs, bars, pipes and structures
Timber and timber products
Vehicles, aircraft & boats

Maydon Wharf multi-purpose terminal

SAPO operates a joint venture with the private sector at Maydon Wharf. The bulk of the terminals on Maydon wharf are privately operated.

Typical cargoes

Bulk salt, fertiliser and other mineral products
Scrap and good steel
Small volumes of containers
Timber

Port of East London 33°1'S 26°55'E

Constructed at the mouth of the Buffalo river, the Port of East London has two quays on the East and West bank, each with six berths. The port is depth restricted to handling vessels of 8.5 to 10 meters draft. Back-of-quay land is restricted by steep cliffs which limit development.

Table 24 – Cargo handled at port of East London, 2006 (metric tons except containers)

	Landed	Shipped
Bulk	1,051,466	87,970
Break bulk	260,451	106,224
Containers (TEU)	17,110	21,198
Total cargo	1,311,917	194,194
Total cargo handled		1,506,111

East London car terminal

Typical cargoes

New import and export Daimler Chrysler vehicles

Storage

2,800 vehicle parking bays (can be increased to 7000) in a 3800m² parking garage 12,200m² open storage. Dedicated private road to the Daimler Chrysler plant.

Throughput

50,000 units per year (can be increased to 180000 vehicles per year)

East London multi-purpose terminal

Typical cargoes

Containers
Copra cake
Livestock
Maize
Motor vehicles
Rice
Scrap steel
Sunflower seed
Timber logs
Wheat

Port of Port Elizabeth 34°01'S 25°42'E

The Port of Port Elizabeth predominately serves the industrial centre of Port Elizabeth-Uitenhage, agriculture in the Eastern Cape hinterland and manganese ore exports from the Northern Cape.

Table 25 – Cargo handled at port of Port Elizabeth, 2006 (metric tons except containers)

	Landed	Shipped
Bulk	1,121,637	2,686,937
Break bulk	584,273	477,666
Containers (TEU)	220,519	172,294
Total cargo	1,705,910	3,164,603
Total cargo handled		4,870,513

Port Elizabeth multi-purpose terminal

Typical cargoes

Citrus fruit
Deciduous fruit
General cargo
Manganese ore

Motor vehicles
Wheat

Port Elizabeth container terminal

Typical cargoes

20 and 40' general-purpose and refrigerated containers

Throughput

360,000 TEUs

Port of Mossel Bay 34°08'S 22°08E

The Port of Mossel Bay is a fishing harbour with a maximum draft of 6.5meters. It has expanded to serve the off-shore oil and gas drilling industry and Gas to Liquid Mosgas refinery. Two buoy petroleum transfer terminals are operated.

Table 26 – Cargo handled at port of Mossel Bay, 2006 (metric tons)

	Landed	Shipped
Bulk	472,533	958,089
Break bulk	41,634	46,341
Total cargo	514,167	1,004,430
Total cargo handled		1,518,597

Port of Cape Town 33°54'S 18°06'E

The Port of Cape Town is a general cargo port handling containers, refrigerated agricultural products, petroleum, chemicals and a wide range of general cargo. The container terminal can accommodate vessels drawing 14meters. SAPO operates the container and multi-purpose terminal. Important private sector terminals are tanker terminals, chemical terminals, ship repair and fruit.

Table 27 – Cargo handled at port of Cape Town, 2006 (metric tons except containers)

	Landed	Shipped
Bulk	2,569,588	816,847
Break bulk	223,499	336,103
Containers (TEU)	380,979	401,889
Total cargo	2,793,087	1,152,950
Total cargo handled		4,134,740

Cape Town container terminal

Typical cargoes

20' and 40' general-purpose and refrigerated containers
Small volumes of 45' containers

Cape Town multi-purpose terminal

Typical cargoes

Aircraft
Barley
Base metals
Bentonite
Boats
Cement
Containers
Copper
Dairy products
Fertilisers
Fish
Fish products
Fruit
Glass
Glassware
Granite
Machinery
Maize
Malt
Oats
Paper
Paper products
Scrap steel
Soya
Steel
Timber
Vegetables
Vehicles
Wheat

Port of Saldanha Bay 33°02'S 17°58'E

The Port of Saldanha is a deep-water port dedicated to handling bulk minerals, petroleum (for storage) and processed metals. The iron ore jetty has a draft of 21 metres.

Table 28 – Cargo handled at port of Saldanha Bay, 2006 (metric tons except containers)

	Landed	Shipped
Bulk	4,014,437	28,233,075
Break bulk	242	1,072,026
Total cargo	4,014,679	29,305,101
Total cargo handled		37,773,192

Saldanha Bay bulk terminal

Typical cargoes

Iron ore

30.9 Mtpa (being increased to 38 Mtpa)

Saldanha Bay multi-purpose terminal

Typical cargoes

Anthracite
Chloride slag
Coking coal
Copper
Galvanised steel coils
Granite
Hot-rolled steel coils
Lead
Pig iron
Rutile
Steel pellets
Sulphate slag
Zircon

Throughput

1.2 Mt

Appendix 2 – South African trade with the world

Table 29 – South African trade with the world: top 10 exported products in 2005, Q1-Q3 2006

HS code categories	Total exports (Rbn)	Share of total exports (%)	Total exports (Rbn)	Share of total exports (%)	Total exports (Rbn)	Share of total exports (%)	Total exports (Rbn)	Share of total exports (%)
	2005		1Q2006		2Q2006		3Q2006	
Precious metals	80.2	25.0	21.0	27.6	25.9	29.3	28.7	27.7
Iron and steel	38.2	11.9	7.1	9.3	8.8	9.9	12.0	11.6
Mineral fuels & oils	31.5	9.9	7.7	10.2	6.6	7.5	7.7	7.4
Vehicles	26.8	8.4	6.3	8.3	7.3	8.2	8.6	8.3
Machinery and boilers	21.5	6.7	5.5	7.3	6.8	7.7	8.4	8.1
Ores, slag & ash	14.6	4.6	3.7	4.9	5.2	5.8	4.8	4.6
Aluminium	10.8	3.4	2.6	3.4	3.2	3.6	3.8	3.6
Fruit & nuts	8.0	2.5	1.7	2.2	2.1	2.4	3.2	3.1
Inorganic chemicals	7.6	2.4	1.9	2.5	1.6	1.8	1.7	1.7
Electrical & electronic equipment	5.7	1.8	1.2	1.6	1.7	1.9	2.6	2.5
Total	**244.99**	**76.6**	**58.6**	**77.2**	**69.2**	**78.1**	**81.6**	**78.6**

Source: TIPS 2007: Harmonised System level 2

Table 30 – South African trade with the world: top 10 imported products in 2005, Q1-Q3 2006

HS code categories	Total imports (Rbn)	Share of total imports (%)	Total imports (Rbn)	Share of total imports (%)	Total imports (Rbn)	Share of total imports (%)	Total imports (Rbn)	Share of total imports (%)
	2005		1Q2006		2Q2006		3Q2006	
Machinery and boilers	55.20	15.7	15.4	16.4	16.7	15.9	20.8	17.4
Mineral fuels and oils	49.95	14.2	15.7	16.7	20.1	19.0	14.8	12.4
Electrical and electronic equipments	36.40	10.4	8.4	8.9	11.3	10.7	12.7	10.6
Vehicles	35.90	10.2	9.7	10.3	11.0	10.4	12.1	10.1
Motor Vehicle parts	30.63	8.7	7.9	8.5	8.5	8.1	10.0	8.4
Medical & surgical equipment	11.12	3.2	3.1	3.3	3.2	3.0	3.9	3.3
Aircrafts	9.60	2.7	0.8	0.8	0.9	0.9	1.5	1.3
Plastic	8.98	2.6	2.3	2.4	2.3	2.2	3.0	2.5
Pharmaceutical products	7.44	2.1	2.1	2.3	2.0	1.9	2.6	2.1
Precious metals	7.06	2.01	1.4	1.4	1.9	1.8	2.6	2.2
Total	**252.28**	**71.9**	**66.7**	**71.1**	**77.8**	**73.8**	**83.9**	**70.3**

Source: TIPS 2007: Harmonised System level 2

Appendix 3 – Vessel arrivals at South African ports

Table 31 – Vessel arrivals at South African ports, January - December 2006

	Richards Bay		Durban		East London		Port Elizabeth		Mossel Bay		Cape Town		Saldanha Bay		Total all ports	
	No	GT	No	GT	No	GT	No	GT	No	GT	No	GT	No	GT	No	GT
General cargo																
General cargo	248	5,395,664	804	10,718,314	10	130,123	51	853,548	5	50,807	356	4,726,755	85	1,687,613	1,559	23,562,824
Total genl cargo	*249*	*5,426,431*	*811*	*10,845,000*	*10*	*130,123*	*57*	*991,959*	*5*	*50,807*	*372*	*4,998,981*	*87*	*1,749,147*	*1,591*	*24,192,448*
Bulk																
Bulk dry	1001	47,069,155	694	14,494,687	17	305,147	105	2,476,734	2	94,174	251	6,809,226	269	17,482,298	2,339	88,731,421
Bulk liquid	3	68,908	11	436,605	0	0	1	3,888	0	0	3	147,803	26	2,606,304	44	3,263,508
Total bulk	*1004*	*47,138,063*	*705*	*14,931,292*	*17*	*305,147*	*106*	*2,480,622*	*2*	*94,174*	*254*	*6,957,029*	*295*	*20,088,602*	*2,383*	*91,994,929*
Containers																
Cellular	9	188,506	1359	35,851,055	65	974,917	471	16,199,695	0	0	799	24,877,567	1	31,649	2,704	78,123,389
Reefer	1	9,274	192	1,564,585	0	0	88	774,270	0	0	216	1,754,449	0	0	497	4,102,578
Total containers	*10*	*197,780*	*1551*	*37,415,640*	*65*	*974,917*	*559*	*16,973,965*	*0*	*0*	*1015*	*26,632,016*	*1*	*31,649*	*3,201*	*82,225,967*
Tankers																
Tanker - oil	23	714,221	196	9,786,173	1	5,145	8	129,881	11	279,802	72	2,442,963	10	1,201,587	321	14,559,772
Tanker - chemical	126	2,014,759	362	6,389,300	60	966,391	51	969,513	51	1,110,741	99	1,800,879	3	321,842	752	13,573,425
Tanker - LPG	21	345,317	56	1,126,356	0	0	4	37,304	1	27,997	18	544,600	1	157,976	101	2,239,550
Total tankers	*170*	*3,074,297*	*635*	*17,324,658*	*61*	*971,536*	*63*	*1,136,698*	*63*	*1,418,540*	*190*	*4,791,563*	*14*	*1,681,405*	*1,196*	*30,398,697*
Passenger vessels	17	334,711	61	1,307,285	13	196,969	22	390,768	12	65,228	44	705,267	0	0	169	3,000,228
Car / car carriers	1	57,280	288	11,230,328	104	4,969,311	105	4,680,257	0	0	1	45,796	0	0	499	20,982,972

	Richards Bay		Durban		East London		Port Elizabeth		Mossel Bay		Cape Town		Saldanha Bay		Total all ports	
	No	**GT**	**No**	**GT**	**No**	**GT**	**No**	**GT**	**No**	**GT**	**No**	**GT**	**No**	**GT**	**No**	**GT**
Ro-ro vessels	8	165,077	68	1,545,010	1	54,332	1	15,575	1	5,825	9	149,660	0	0	88	1,935,479
Other vessels	11	416,900	42	486,725	3	5,286	2	1,576	3	28,629	12	306,383	0	0	73	1,245,499
Total ocean going	1470	56,810,539	4161	95,085,938	274	7,607,621	915	26,671,420	86	1,663,203	1897	44,586,695	397	23,550,803	9,200	255,976,219
Total coastal	40	86,474	108	1,141,231	23	514,423	30	594,872	16	419,535	73	1,277,942	10	509,327	300	4,543,804

Source: NPA Port Statistics

Note: excludes miscellaneous vessels

Appendix 4

Table 32 – Rail and maritime divisional revenue, earnings and margins 1996 to 2006 (R-million)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Rail division											
Revenue	7,704	8,336	8,875	9,100	9,140	10,300	10,900	15,660	18,176	19,563	18,105
Operating profit after finance costs	98	712	573	-135	84	605	778	182	-382	677	1,003
Operating profit margin %	1.3%	8.5%	6.5%	-1.5%	0.9%	5.9%	7.1%	1.2%	-2.1%	3.5%	5.5%
Maritime division											
Revenue	3,050	3,594	3,845	3,433	4,480	5,000	5,600	6,415	7,512	8,400	8,740
Operating profit after finance costs	1,397	1,709	1,653	1,380	1,390	1,900	2,267	1,413	2,380	3,619	3,947
Operating profit margin %	45.8%	47.6%	43.0%	40.2%	31.0%	38.0%	40.5%	22.0%	31.7%	43.1%	45.2%
Year on year revenue growth %		**15.1%**	**6.5%**	**-12.0%**	**23.4%**	**10.4%**	**10.7%**	**12.7%**	**14.6%**	**10.6%**	**3.9%**

Source: Transnet annual financial statements

Note: 1 Rail division includes commuter rail and inter-city passenger rail
2 Maritime division includes SAPO and NPA after sub-divisonalisation in 2001