CHAPTER THREE

GOVERNMENT STAKEHOLDING AND INTERVENTION IN THE DEVELOPMENT OF SOUTH AFRICAN MARITIME SUPPLY CHAINS

3.1 Introduction

According to conventional economic theory, trade liberalisation enables producers to exploit their comparative cost advantages in global markets and so raise the efficiency of the world economy, which eventually becomes manifest in higher living standards. Whether poor countries actually benefit from trade liberalisation in accordance with the theory is still a matter for debate, especially when trade barriers are only selectively raised by developed countries. Furthermore, the theory applies only when the comparative cost advantages stem from the intrinsic cost of resources and are not brought about by government subsidies or assistance tantamount to subvention (Kaale, 1994:A2-1; Stopford, 1997:Chapter 7).

In any event, producers in countries that benefit from trade liberalisation, whatever the outcome in practice, must create or participate in the global supply chains that enable the expansion of international trade. In order to do so, not only must their products be globally competitive when produced, but also when delivered. That requires the costs of moving products along the supply chains to sustain the comparative cost advantages of the products, i.e. the supply chains themselves must be competitive. However, state subsidisation of physical supply chain functions, in one form or another, also occurs and is less evident or easy to detect than the subsidisation of production costs, especially when the subsidisation takes place through the subvention of shipbuilding or is obscured in the accounting of state transport enterprises or is manifested in the non-enforcement of standards or requirements that relate to safety, security, employment and the environment (Committee of Inquiry into a National Maritime Policy for the Republic of South

Africa, 1993:22). In principle, maritime supply chains or at least their elements are required in terms of international conventions as well as national legislation and regulation to operate in a manner that limits the risk of harm to persons and private and public property (including international property) and does not involve the abuse of human rights, but transgressions are common in practice (Stopford, 1997:422).

The exploitation of labour and the disregard for personal safety with which multi-national companies operate in undeveloped countries according to often repeated accusations (Cahill, 1998), is not a topic that falls within the scope of this thesis. However, if that occurs, it without doubt also occurs in the operation of supply chains in those countries. Nevertheless, the presumption in this thesis is that the managers of overland links in international supply chains, wherever, observe the laws that apply in the countries traversed or have responsibly received exemption, i.e. that the overland links in the international supply chains are operating legally within the laws of the countries in which they operate. The presumption is unavoidable because it is not within the scope of this study to prove otherwise.

National legislation and industry policies in South Africa are discussed in this chapter insofar as they constitute a particular difference in the business circumstances in which South African maritime supply chains compete with rival supply chains in international trade. It is obviously outside the scope of this thesis to deal with all the differences or with any difference in detail insofar as it affects specific chains of supply. The discussion on this topic is thus limited to legislation and policies that are unique to South Africa. One difficulty in dealing adequately with the topic is that South Africa has imposed laws and regulations affecting supply chains in conformity with those extant in the developed countries with which it trades in order to facilitate such trade, but also trades and competes with developing countries which do not impose or enforce similar restrictions consistently or constantly.

A unique issue confronting South African firms in the maritime supply chain business is that stemming from the Maritime Transport and Services Industry

Black Economic Empowerment Charter. As the charter seems to have no parallel in other countries with which South Africa competes, it is necessary to explain the background and motivate the charter in order to consider its potential effect on the development of economically efficient supply chains. That discussion is pursued in section 3.4. Before proceeding to that section, the actual stakeholding of the Government in South African supply chains needs to be critically examined.

3.2 Present role of Transnet

Brief history of Transnet Ltd

In terms of the Legal Succession to the South African Transport Services Act, 1989 (Act 9 of 1989) and the legislation that it incorporates by succession, South African ports and railways are owned and operated by a company, namely Transnet Ltd (Transnet), in which the equity belongs entirely to the State. In consequence, Transnet functions as a state enterprise in which the Minister of Public Enterprises on behalf of the Government, as shareholder, intervenes in important decision-making. Furthermore, in terms of section 17 of the Act, the Minister of Public Enterprises may direct Transnet to discontinue any activity which runs contrary to the strategic or economic interests of the country. The Government, through Transnet as the sole supplier of port and rail services in South Africa, is consequently a major stakeholder in many of the country's maritime supply chains.

Transnet is the eventual successor to the South African Railways and Harbours Administration (SAR&H Administration) that was established in 1910 with the advent of the Union of South Africa (Franzsen, Smith, Tomlinson, Reynders, De Loor, Williers, De Kock & Lombard, 1960:160), but came into existence formally in 1916 (Goosen, 1997:Chapter 2). The Union comprised the littoral provinces of the Cape of Good Hope and Natal, formerly British colonies, and the two landlocked provinces of the Transvaal and Orange Free

State, formerly independent republics. In order to meet the concerns of the latter provinces about their lack of access to the sea, article 127 of “Die Zuid-Afrika Wet” containing the constitution of the Union (Franzsen, *et al.* 1960:160), stipulated that the railways should be administered on business principles and promote the development of an agricultural and industrial population in the interior of the country by means of cheap transport, (i.e. cheap transport between the ports and the landlocked provinces, because the rail network was so constructed.) “Business principles” meant, in terms of the legislation, that the income of the Administration should be sufficient to cover only the costs of exploitation, maintenance, betterment, depreciation and running expenses. As a department of government, the SAR&H Administration monopolised the market for transport services in the country at that time. Road motor transport was still in its infancy, but in any event was considered only as a complementary mode to rail transport (Floor, 1985). When it eventually developed as a competitive mode of transport to railways, regulation was imposed on the supply (Motor Carrier Transportation Act, 1930 (Act 39 of 1930).

Although the name of the administration was changed to South African Transport Services (SATS) in 1981 (South African Transport Services Act, 1981 (Act 65 of 1981)), it continued to function in much the same form until 1989, when it was constituted as a company with the state as the sole shareholder (which required special dispensation as a minimum of two shareholders is required in terms of the Companies Act, 1973 (Act 61 of 1973), as amended). During the period 1916 to 1989, the Administration and then SATS expanded into a huge monolithic organisation providing secure employment with many social benefits to a staff that eventually exceeded some 275 000 persons (Die Suid-Afrikaanse Vervoerdienste Jaarverslag, 1981/82). Although the Administration prepared and presented capital and operating budgets to Parliament separately from the national budget in terms of its enabling legislation, macro-economic policy was sometimes taken into account in the spending on capital projects while political considerations were invariably of concern in the expenditure on salaries and wages (Du Plessis, 1951). For many years, the criterion for investment was mainly the need for

more capacity based on engineering decisions, rather than the business rationale for providing that capacity, notwithstanding the legal requirement that the Administration should be conducted according to business principles. Spending was also incurred with due consideration to provincial equity, for political reasons, as the neglect of any region in the development of the ports and railways was sure to cause political repercussions[1)]. In consequence, the SAR&H Administration (and SATS) eventually developed an infrastructure and staff complement that was unsustainable, largely because of the excessive costs of the organisation and its social obligations, while traffic was being lost to road hauliers[2)]. Although the Administration was for many years able to maintain much of its monopoly of commercial transport through the regulation of the supply of road freight transport (Road Transportation Act, 1977 (Act 74 of 1977) and the preceding act of 1930), lack of enforcement and illegal carriage of goods by road (by so-called grey carriers) eventually obliged the Government to deregulate the trade (Deregulation of Transport Act, 1988 (Act 80 of 1988) implemented in 1993).

With the reconstitution of SATS as Transnet Ltd in 1989, the intention was to commercialise and corporatise the undertaking and relieve it of its social obligations which had become a massive financial burden[3)], but that was a forlorn hope in the political environment at the time, some five years before the negotiation of a new national constitution in 1994[4)] and the change in the political dispensation that followed. In the meantime, no significant capital investments were made and development stagnated. When the new (post-apartheid) Government came into power, Transnet became a major target for political transformation, which resulted in a ten-year period of ongoing managerial changes, accompanied by much indecision and uncertainty about the restructuring of the company's assets and the direction of its development. One outcome was the continued neglect of investment in infrastructure and equipment as well as the loss of experienced staff.

Problems experienced by Transnet and proposed solutions

The effect of the history of Transnet is to render its future role in the development of South Africa's maritime supply chains open to question. Several of its senior officials are pessimistic. For example Ravi Nair (Lourens, 2003:4) stated in August 2003, "one of the main problems that cannot be solved easily is that of ageing rolling stock. Locomotives and wagons are 40 years old on average, and Spoornet has allocated about R15 billion over the next 15 years to upgrade its fleet. But we will only have the first new locomotives in three to four years". He added that the problem had developed owing to lack of investment over the past two to three decades. In another comment, the question is asked whether the Government's resolve to commit some R50 billion towards improving core ports and railroad facilities over five years is not "too little too late"(Smuts, 2005a:8). Certainly South African Port Operation's Mervin Chetty views it essentially as "small sticking plaster", stating that "the investment is nothing but a band-aid, basically to stop the bleeding we have because the country has experienced an investment backlog (in) what should have been committed five or ten years ago."(Smuts, 2005a:8). The Group Chief Executive of Transnet, commenting on the financial statements for the year ended March 2005, states "I must say that we still have a long way to go" (that is, to recovery) (Faniso, 2005a:19).

In recent years, many other commentators have emphasised the lack of investment by Transnet in the past and the difficulty in catching up in the near future (Peat, 2005a:4; Faniso, 2005b; Smith, 2005:16; Ueckermann, 2005; Chalmers, 2004; Bridge, 2004; Neill, 2002:6; Fraser, 2004a). There have also been numerous statements by officials and politicians about the huge amounts Transnet intends to invest in order to raise its efficiency. For example, the Business Report of July 5, 2005, mentions an amount of R40,8bn (Ntingi, 2005:19), but no assurance has yet been given that Transnet has the capacity to spend that amount in order to achieve its purpose and, furthermore, no explanation has been given of how spending that amount on infrastructure and equipment will raise efficiency, bearing in mind the difficulties experienced throughout the country with the delivery of public services, despite the

allocation of the requisite funds (Loxton, 2005). The adage that inefficiency cannot be overcome through capital investment should also not be overlooked. While the intention to spend large amounts on infrastructure and equipment does not actually resolve the problem of Transnet's current inability to meet the needs of maritime supply chain users, the solution required is really one that obviates similar problems in the future rather than one that holds a somewhat uncertain promise of an improvement. In the following sub-section, some of the current problems experienced by Transnet are summarised in the words of senior officials of the company's management, from which it is evident that internal solutions are unlikely to be realised in the short term.

Function in the future development of maritime supply chains

In Chapter Four, several of the major South African maritime supply chains in which Transnet has a stakeholding are described and complaints by chain users about the company's lack of performance and the business which those users have consequently lost are mentioned. The purpose in doing so is not merely to criticise Transnet, but to raise the question dealt with in Chapter Seven, namely whether as a state enterprise its role is conducive to leadership in the development of the modern maritime supply chains needed in South Africa. There seems to be general agreement that private participation in Transnet's new ventures is essential (Erwin, 2005), which is also an acknowledgement that on its own Transnet cannot comply with the demands of the market. The questions to which this leads are: What role is required of Transnet in the future development of South Africa's maritime supply chains? Whether that development should not be entrusted to the private sector? At stake is really the issue of whether the constant upgrading of the supply chains needed to maintain the competitiveness of South Africa's exports in foreign markets can remain subject to the ongoing ailments of a state enterprise.

Supply chain efficiency also requires management arrangements between inland carriers and sea carriers, and many liner companies operate road transport undertakings often through subsidiaries. For example, Safmarine owns Road Wing (Allison, 2005a), MSC owns MSC Logistics (Degens, 2005a) and P&O Nedlloyd owns 60% of Cross Country Containers. In countries in which the distance of haul favours rail transport over road transport because of economies of scale, integration of rail links into supply chains usually enables their efficiency to be improved. Several examples of such chains exist, overseas and in South Africa. The South African examples comprise OREX and “Coal line” (see Chapter Four), but it should be noted that the integration of the rail links in these instances, in fact, depends upon agreements between the cargo-owners and Transnet and does not constitute integrated ownership or management. That the existing arrangements are not always successful is evident from published complaints by the cargo-owners (Faniso, 2004:3; Bridge, 2004).

The need for new supply chains in South Africa to integrate rail transport is becoming increasingly evident. Examples are the need for an efficient rail service to haul containers between the new Port of Ngqura (at Coega) and Gauteng over a distance of 1082 kilometres (Merit, 2002a) and between East London and Gauteng (Britz) to haul motor vehicles and their components (Ramos, 2005). The prospects for the success of upgraded rail services or links in the latter supply chains would undoubtedly justify the investment of private capital, but as links in supply chains operated by Spoornet, the schemes would have unnecessarily high operating costs (Ramos, 2005), which is likely to ruin their viability.

According to the State of Logistics Survey for South Africa issued by the Council for Scientific and Industrial Research (CSIR) in February 2005, “structural shortcomings have caused an unhealthy situation (in which) three quarters of long haul tonnage is being transported by road” instead of by rail, for which a “normal” macro-economic model would provide. Obviously the normal model would allocate traffic according to comparative costs, which, for technological reasons, are lower for rail than road over long distances.

Transnet is unable to achieve that advantage in practice because of the high costs of operating its rail services (Singh, 2005:18-20).

The predicament in which Transnet finds itself is reflected in performance statistics and financial statements stretching over a long period and which would require several volumes to reproduce and explain. There is, however, no need to do so as the predicament has been adequately acknowledged by the management of the company. In a statement dated 15 June 2004 by the then Chief Executive of Spoornet (Mrs D Mokgatle) at a stakeholder briefing to Business Unity South Africa, the current performance of the company (Transnet, Ltd) was acknowledged as a reflection of the years of neglect, primarily in the area of investment, with the consequences, as she stated:

- "Many of you perceive us as unpunctual, inflexible and costly
- We are unable to fund capital investment
- Our assets are ageing rapidly and are thus costly to maintain
- Our financial performance has deteriorated
- We have insufficient critical skills
- Employee morale is at rock bottom and there is a poor work ethic
- Finally, there are labour agreements, which need to reflect the new environment and future business aspirations."

Although the statement was made under the title "Spoornet is being reborn" with an outline of the measures to be taken to overcome the deficiencies, the problems described are formidable and obviously can not be resolved in the short term.

In March 2005, at the Ninth National Maritime Conference, the Group Chief Executive of Transnet (Ms M Ramos), drew attention to some of the major problems with which the company is confronted, including:

- the average age of 27 years of the fleet of 2 360 locomotives and 84 633 wagons as against a lifespan of those assets of between 20 and 30 years;
- the current availability of the fleet of approximately 64%;

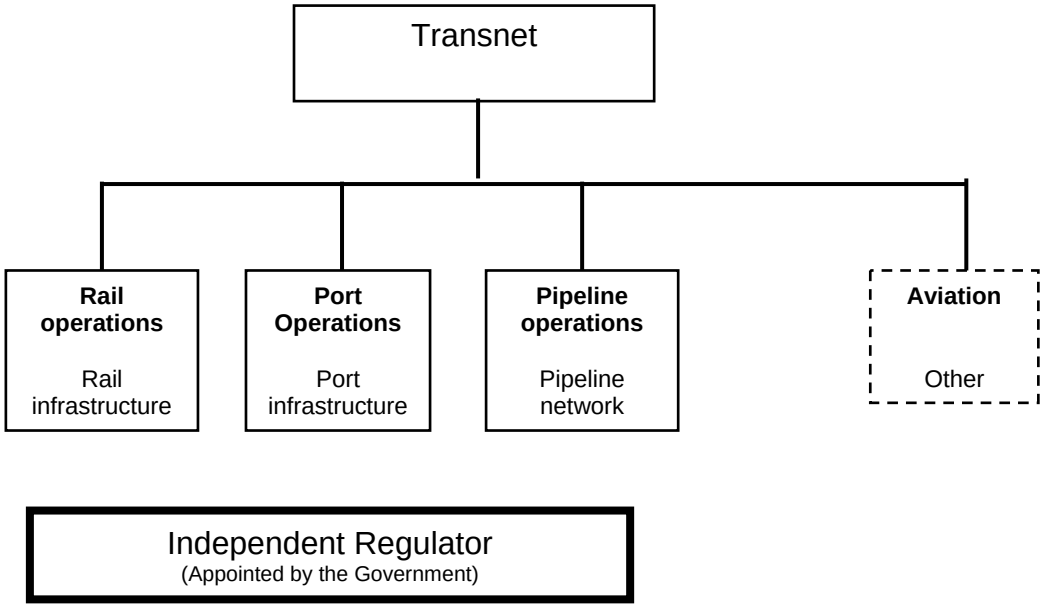
- constraints on OREX of 27,6 mtpa, on the Coal line of 69,3 mtpa and on general bulk freight of 80 mtpa (which are all below the demand);
- ageing key staff – train drivers, engineers, crane drivers at ports, harbour masters and harbour pilots are on average older than 50 years;
- port infrastructure is inadequate considering the existing demand – neither the Ports of Durban or Cape Town can receive the new large containerships (with capacities of between 6 000 and 7 000 containers), while the container terminal at Cape Town operates at full capacity and that at Durban will run out of capacity by 2006; and
- rail traffic excluding exports of coal and ore has declined substantially during the past ten years while that by road has increased.

Ramos added that "there are significant shifts in the SA economy that warrant a closer examination of the supply chains necessary to support the economy" and emphasised that "SA needs to reduce logistics costs by one third to sustain our competitiveness".

Although Ramos outlined a comprehensive programme of measures and projects intended to streamline Transnet and ensure that it "provides efficient transport services to the bulk and manufacturing sectors" and "an efficient transport platform that facilitates trade growth in SA" it is obvious, as she has stated, that the process has a long way to go.

No mention was made in the key address by Ramos about involving the private sector in the measures and projects, apart from promising that Transnet would collaborate "with customers to jointly design services and invest in areas that improve the performance of all parties", but at the same event, the Minister of Public Enterprises (Mr A Erwin) elaborated on the public-private partnership schemes that the Government believed would provide the scope for improvement of South Africa's logistic performances. The new company structure shown in Figure 3.1, shows that Transnet will continue to be responsible for port and rail infrastructure as well as port and rail operations overseen by independent regulators.

Figure 3.1: Transnet's company structure



Source: Ramos, 2005

Although several statements have been made on behalf of Transnet over the past two years to the effect that some railway lines are available for concessioning or lease to private operators (Merit, 2002a) and a few minor lines have actually been leased, there does not seem to be any prospect as yet for the operation of trains by private undertakings on the main lines. More progress, in principle, has been made with the concessioning of the operation of the public (common user) terminals in the ports to private enterprise. The progress consists of many investigations undertaken during the past five years and confirmation from time to time that the container terminals will be available for concessioning, but so far that has not happened (Peat, 2005b:13). Among the reasons for not proceeding, have apparently been the need to satisfy creditors that the foreign debt of the company will not be at risk (Report of the Committee of Inquiry into a National Maritime Policy for the Republic of South Africa, 1993), the difficulty in ensuring that the public terminals, which presently function as monopolies, would encounter effective competition as private undertakings, and the implacable opposition of the labour unions of Transnet employees to any form of privatisation (Orlek, 2005:1). The political repercussions of militancy by the unions have undoubtedly been the overriding concern of the Government and the intended concessioning of the terminals is

in abeyance, although some form of private participation is still under investigation (Erwin, 2004; Michaels, Babalo & Smetherham 2005:1).

Most of the bulk exports through South African ports are loaded at private terminals, which constitute links integrated to some extent into supply chains (Merit, 2000:19), but almost all the public terminals at which imports and exports in containers are handled are operated by South African Port Operations[5)]. Therefore the transfer of cargo from ship to inland carriers and *vice versa* usually involves three separately-managed links in maritime supply chains, i.e. the marine link, transshipment at the ports and inland transport. Slowness in the transshipment of cargo is a particular cause of delays. According to the National Freight Logistics Strategy (Department of Transport, 2005:12), productivity at South Africa's port container terminals measured in lifts per hour is only 17 TEUs against the international benchmark of 35 TEUs per hour. Furthermore, disruption in cargo movement at the interfaces of these links is common (Hendricks, 2005a). A few examples of the consequences are given in Table 3.1. Shippers and shipowners are generally of the view that by integrating container handling at the port terminal with the operation of ships, delays can be avoided because the planning of capacity and its utilisation can then be properly co-ordinated at the interface.

Table 3.1: Examples of results of delays at link interfaces in ports

Port	Result of delays
All ports	Surcharge (South African Port Additional[1)]) applied by shipping lines from May 2003 (to April 2005) because of ongoing congestion and disruption to services[2)] (New, n.d.)
All ports	SAECS employed seven ships on 49 day round voyage schedules instead of six at an additional cost of US$14 million per annum in each service during period of congestion (New, n.d.)
Cape Town Container Terminal	Higher costs to truckers because of offload/load time of three hours instead of one hour (Smuts, 2005c:1)

Source: Compiled by the author for the purpose of the study.

Notes:

1) South African Port Additional is the name of the surcharge imposed by the liner shipping companies.

2) If berthing delays of less than 16 hours over a two month period are sustained, the surcharge is suspended.

The surcharge mentioned in Table 3.1, which was uplifted in April 2005, because delays to ships declined to less than 16 hours from 60 hours, amounted to US$100 (approximately R650) per container or R3.25 million for a ship calling to offload and load 2 500 containers. In July 2005, delays for ships to berth at the Durban Container Terminal rose again to between 30 to 40 hours with some ships being delayed as long as two to three days. The liner companies have refrained from re-imposing the surcharge pending the implementation of improvements in container handling promised by South African Port Operations (Enslin, 2005a).

The prospects of private enterprises being entrusted with the operation of public terminals in the ports is advanced by the National Ports Authority Act, 2005 (Act 12 of 2005), accepted by Parliament on 22 June 2005. The Act has a long history and several drafts were prepared and amended before its acceptance. Its main provisions for the purpose of this thesis are the establishment of the National Ports Authority (Pty) Ltd which may eventually be incorporated as a public company and is intended to become an independent body reporting directly to Parliament, and the South African Port

Operations (SAPO) which will continue to provide cargo services as a division of Transnet. Because Transnet relied largely on the revenue of the former National Ports Authority (which was a division within Transnet and not incorporated as a company) for its income, the new company will remain a division of Transnet for the foreseeable future in order to enable that arrangement to continue. The intention is that the National Ports Authority (Pty) Ltd will function mainly as a landlord and licence operators of port services or grant concessions or leases to enable those services to be delivered. The legislation also provides for a Ports Regulator to be appointed, with many regulatory functions, including regulation to ensure fair competition among service providers. As yet the Regulator has not been appointed and without doubt some time will elapse before regulation is imposed as there is no immediate need to do so. The ports have been operated by Transnet and its predecessors as a monopoly for some ninety years without external regulation and will continue to be so operated for the time being. If and when the operation of the port terminals and the supply of other public services in the ports are entrusted to private enterprises, regulation will be necessary to preclude monopoly pricing wherever that is feasible. However, the charges of the National Ports Authority (Pty) Ltd itself are excluded from filing with the Regulator in terms of section 30(3)(h) of the Act, which in effect means that the charges imposed by the Authority will not be subject to appeals by users[6)]. The National Ports Authority still needs to be incorporated as a private company before the Act can be implemented.

The arguments contained in this section are not intended to afford insight into the problems experienced by Transnet in managing the ports and railways as efficient business enterprises or to advance the cause of privatisation of, or private participation in, those enterprises. All that it is intended to explain is that the ownership and operation of the ports and railways in South Africa by a state enterprise presently seem to constitute an impediment to the ongoing development of the supply chains needed to promote the competitiveness of the country's maritime trade as explained in Chapter Seven. Without examining the underlying reasons, the unsuccessful experience by liner companies to improve South African supply chain efficiency through the

integration of the operation of port terminals and railway services is itself sufficient to establish the grounds for a re-assessment of the role of Transnet in the future development of maritime supply chains (Bailey, 2003:2-3).

In subsequent chapters, Transnet is mentioned frequently in explanations and comments that add to the discussion in this section. That is unavoidable because of its stakeholding in virtually all of South Africa's maritime supply chains.

3.3 Prospects for privatisation of assets of Transnet

Importance of overseas trends and statements of policy

In section 3.2, the function of Transnet in the development of maritime supply chains is discussed in accordance with the pronouncements of company officials, events and new legislation on ports, but as yet the private sector is uncertain of what will eventuate, notwithstanding the bottlenecks that are experienced as mentioned in that section and Chapter Four, and the need to develop new and more efficient maritime chains.

In order to reach more certain conclusions about the prospects for the privatisation of the rail and port assets and operations of Transnet, it is necessary to examine trends overseas, which undoubtedly influence government policy in South Africa[7)] and to take account of statements of policy on behalf of the Government. The trends overseas are dealt with in section 5.2 and several examples of maritime supply chains that have evolved from those trends are described in sections 5.3 - 5.5.

Motivation for privatisation of state assets

The restructuring of the assets of Transnet in order to render the enterprise more efficient has been under consideration for a long time (Erwin, 2004) and as privatisation represents the logical extension of the process (Kopicki & Thompson, n.d.:20), the prospects for that happening in the development of the major maritime supply chains serving South Africa need to be examined. Most of the argument for the privatisation of Transnet's assets is advanced through the contention that the efficiency of the enterprise or the divisions privatised will so be raised (or achieved), but a rationale for that contention in scientific literature is lacking[8)]. Kopicki, *et al.* (n.d.) point out that the overriding criterion for restructuring should be the value created within the enterprise and that the most precise arbiter for the value created in ownership rights is the market for corporate control. In accordance with this principle, state enterprises that the private sector seeks to acquire are worth less than their potential value and in that sense are inefficient. Their efficiency is thus reflected in the demand for their privatisation. The demand would fall away if their efficiency was raised to the extent of their potential value in the market as their acquisition by the private sector would then yield no gain, except if they were allowed to function as private monopolies.

Government policy towards privatisation

In section 3.2, various announcements by officials of Transnet concerning the future of the company are mentioned and in particular reference is made to the address by the Minister of Public Enterprises on 14 June 2004 in the National Assembly (Erwin, 2004). He stated that Transnet will remain a state-owned enterprise located within a system of public-private partnerships, "the purpose of which is to achieve higher levels of investment; overall system efficiency for the economy; improved technological capacity; improved management (within public and private entities) of public assets; enhanced human resource capacity; sustainable non-resource financing options and better customer service'. Within those partnerships Transnet will "play the pivotal and decisive

role", which presumably implies that Transnet will not forgo the leadership of maritime supply chain integration if such integration is achievable through public-private partnerships. The Minister also declared that a state-owned enterprise "cannot operate in order to maximise profit, it has to maximise certain economic benefits (externalities if you like)" and that it "operates in the market but within rules that are not derived from the logic of the market place alone". Another important statement by the Minister was that initial public offering of shareholdings in a state-owned enterprise would be offered only when its corporate structure and balance sheet were strong and the opportunity arose to so lower the cost of capital. That does not yet apply to Transnet and according to the Minister's statement the prospects for private participation in Transnet's business (apart from the scale of non-core assets) during the next five years will be confined to concessions, joint ventures and public-private partnerships – presumably without public shareholding. The Minister also mentioned that the Department will work closely within the National Economic Framework in order "to facilitate Black Economic Empowerment within the restructuring of state assets".

The address by the Minister to Parliament comprehensively explains the economic policy of the Government concerning state-owned enterprises and in particular spells out the conditions under which private developers could incorporate rail and port links in the integration of maritime supply chains in South Africa. As explained in Chapter Seven, micro-economic logic dictates that the leadership of supply chains constructed to export large quantities of mineral and ores should vest in mine owners and that of container supply chains in liner companies. The integration of the links of maritime supply chains through joint ventures or public-private partnerships in order to improve their competitive efficiency in world markets, might consequently be frustrated if Transnet insists on fulfilling the "pivotal and decisive role" in the provision of the rail and port links. In accordance with the economic policy explained, Transnet's role in supply chains is seen by the Government as that of a third party service provider independently responsible for decisions concerning investment in links in the chain and the productivity of those links. That role seems to preclude the prospect of integrating maritime supply chains to

compete in world markets as cost entities (see section 2.1). Integrated management might be achievable through the granting of concessions to operate rail links and port terminals (e.g. the Richards Bay Coal Terminal), but whether the unit costs of the chain so constructed would be equivalent to the unit cost of a fully-integrated chain would depend upon the financial arrangement of the concession. This topic is pursued in Chapter Seven.

Although the declared policy of the Government to grant concessions and enter into joint ventures and public-private partnerships seems to accord with the outcome of the restructuring of the assets of railways and ports in the countries dealt with in section 5.2, with the exception that the assets will not be sold, there are fundamental differences that should not be overlooked. The Government will not allow the private sector to appropriate value for itself by "cherry picking" the most profitable opportunities in order to maximise the rate of return, avoid external costs and shorten payback periods (Erwin, 2004). Joint ventures or public-private partnerships with Transnet will be regulated through a complex "compact between two different financing and operational systems – public and private" (Erwin, 2004). Taken together with the constraint that "the (state-owned) enterprise cannot operate in order to maximise profit", it is evident that the policy of the Government will not permit Transnet to participate in schemes in which rail and port links are "cherry picked" for financial integration into maritime supply chains in order to achieve their maximum profitability in international markets. The Government's policy in the tension between the public and private sector that "inexorably impels the latter towards appropriating value for itself" (Erwin, 2004) is thus to intervene in what is really the manifestation of the free market by "increasing the public sector in strategic areas through for example, nationalisation, purchasing a shareholding in companies, establishing new corporations or joint ventures with the private sector" (Restructuring and Development Programme, 1994).

An interesting question is whether Transnet would be permitted to enter into a joint venture or partnership in the provision of the transport links of a mineral export supply chain if the effect was to ensure a greater penetration of the product in world markets with consequent local employment and welfare

benefits, notwithstanding profit-taking by the mine owners, or whether Transnet would require shareholding in the mining venture[9)]. Another question is whether Transnet would venture into the business of liner shipping in order to lead the construction of door-to-door container supply chains. The answer to these questions undoubtedly depends upon how the need for South Africa's maritime supply chains to compete aggressively in the free markets of the world can be reconciled with the social obligations imposed on Transnet, as a state-owned enterprise in terms of the policy of the Government. The fulfillment of those obligations in the interests of equity necessarily requires centralised planning and control by Transnet, in contrast to the manner of rail and port restructuring in other countries, with the exception of Sweden, as described in Table 5.5. Centralised planning and control accords in principle with the policy pursued by the Government in the administration of Transnet and its predecessors since the establishment of the undertaking in 1910 (see section 3.2), although equity was selectively applied by the governments in power. However, the contention in this thesis is that the exigencies of maritime supply chain development in the interest of national economic growth cannot be accommodated without changing the policy that has governed the public administration of railways and ports since the formation of South Africa, on the grounds that financial and managerial integration of the links for competitive success in international markets requires private initiative, as considered in Chapter Seven.

Essence of problems stemming from role of Transnet

In essence the problems that arise with the stakeholding by Transnet in South Africa's maritime supply chains are:

i. That, for whatever reason, the investment and proficiency needed to ensure that the performance of the rail and port links in keeping with the demand by users has not been forthcoming over a long period and
ii. that the role required of Transnet in accordance with the policy of the Government does not allow the integration of the supply chains under single management.

Although Transnet intends to spend some R40bn on infrastructure over the next five years in order to eliminate the backlog in investment, that will not necessarily improve delivery without an accompanying improvement in operational proficiency, nor will it enable maritime supply chains to be developed under single ownership in keeping with world best practice. Solutions to these problems could be forthcoming if some of the investment could be made through public-private partnerships empowered to control the rail and port links in bulk supply chains and if private container terminals and the private operation of trains are allowed.

3.4 Black Economic Empowerment in the maritime industry

Background

As no intermodal supply chains integrated with rail or port links are likely to be structured in South Africa in the future without the involvement of black economic empowerment in some form or another, the topic needs to be dealt with in some detail. In principle, the developers of integrated supply chains to serve the country are thus confronted with a condition not encountered in other countries, which requires explanation.

The premise on which the policy of the Government towards Black Economic Empowerment (BEE) is based is that the economy of the country is sustainable in meeting the needs of all its citizens only if the full potential of everyone is realised. Underlying that policy is the Freedom Charter formulated by the African National Congress in 1955 and refined in its Reconstruction and Development Programme when it came into power in 1994. The new Constitution then adopted the need to redress the injustices and inequalities of the policy of apartheid in the interests of equity. Broad economic strategies to transform the economy accordingly by 2014 have since been outlined by the Government. These strategies extend beyond measures to overcome racial

economic disparities and include State intervention to ensure gender and ethnic equality and access to wealth, income, skills and employment for all. Among the strategies is the Strategy for Broad-Based Black Economic Empowerment (Department of Trade and Industry, 2003:1-34).

Although that strategy is widely regarded as the process whereby the inequalities and injustices inflicted by apartheid on the black population of South Africa are redressed through the preferential advancement of blacks, the rationale of the concept, as officially defined, is economically and socially more profound and undoubtedly in the long-term interests of the entire South African community. If success is to be achieved, it is obvious that entrepreneurs will need to perceive BEE as creating opportunities to raise the net worth (or potential net worth) of their business undertakings, rather than merely being obliged to redistribute wealth and income. Cosmetic measures intended to improve the BEE-scorecard of a firm for short-term profit-making ventures are more than likely to achieve mainly black enrichment and risk the loss of the firm's credibility.

Objectives of the Maritime BEE Charter

The BEE Charter in the maritime industry aims to go beyond merely creating opportunities for historically disadvantaged people (Department of Transport, 2004:4-9). It aims to enhance awareness of the existence of those opportunities, especially in view of the traditional lack of maritime awareness characteristic of South Africa's population. It also aims to ensure the acquisition of the appropriate skills needed in the industry, which to a large extent has been provided by foreigners in the past (Kaale, 1994:A2-1). Finally, the aim is to transform the ownership of companies that constitute the industry, which is presently foreign-dominated.

The charter provides for skills development and learnerships, particularly for the unemployed, as additional targets to those set out in the Skills Development Act, 1998 (Act no 97 of 1998). It is hoped not only to assist in

accelerating the skills development of workers generally in the maritime industry, but also to attract new entrants.

Equally important among the intentions of the charter is to ensure that firms in the industry assist in the development of new enterprises. Foreign firms with no local asset base are expected to place more emphasis in that direction, if it is not possible for them to offer equity to blacks and others regarded as previously disadvantaged. Most, if not all the elements of the scorecard, for which the charter provides, have specific targets for women and people living with disabilities in order to ensure transformation and empowerment “across the board”.

Procurement from black-owned or black-empowered firms specifically including small, medium and micro enterprises has also been agreed as a target insofar as it relates to services that can be procured from such enterprises.

Scorecard

The Maritime Transport and Services Industry BEE Charter provides for the use of a *balanced scorecard* to measure progress towards achieving BEE according to:

- direct empowerment through ownership and control of enterprises and assets;
- direct empowerment by meeting targets in order to achieve the required combination of employees from top management through to staff (employment equity);
- indirect empowerment through skills development of staff within organisations;
- indirect empowerment through preferential procurement and enterprise development; and

- indirect empowerment through job creation, social development and sector specific awareness campaigns (Department of Transport, 2004:4-9).

Apart from various measures to promote BEE through procurement policies, regulation, and financial and institutional support, the Government envisages (Erwin, 2004; Michaels, *et al.* 2005:1) entering into partnerships with the private sector, which may include trade unions and community-based organisations. How these partnerships will function and how they will promote BEE in a market economy or specifically in the maritime industries is by no means clear, but the notion at this stage is obviously open for innovative suggestions (Peat, 2005b:13).

In order to clear up any confusion concerning the terms *partnerships and charters*, that are often wrongly used by stakeholders in the industry, the BEE Directorate of the Department of Trade and Industry (DTI) has given the following definitions:

"A *partnership* is when Government and the private sector undertake a project together, e.g. proposed project to build an aluminium smelter at Coega.

A *charter* is a formal process where various stakeholders agree on a framework for a particular sector, develop a draft charter and present it to the Government for approval, with key indicators being challenges, a vision statement and the development of a scorecard with calculated standards and definite set time frames" (Department of Transport, 2004:4-9).

While these definitions may not be all that enlightening, they do serve to indicate that the Government regards a partnership as involving joint action and a charter as a commitment to implement BEE.

Scope for BEE in the liner industry

According to the Maritime Transport and Services Industry BEE Charter scorecard (see Annexure A), BEE ownership does not (and cannot) apply to the foreign-owned liner companies trading to South Africa. However, it applies to locally registered subsidiary companies and locally based assets of foreign companies, but whether the Government can expect these to be black-owned is doubtful as that would deter foreign investment although at least one such company has concluded a transaction that constitutes substantial BEE (Hutson, 2004:1). No doubt the Government would be content if such companies were to become black-empowered (i.e. with a 25.1% holding by black investors). The issue is obviously one to be resolved as BEE is implemented. All foreign liner companies have not, however, ensured that their status as such is properly recognised by the Government in the adjudication of tenders for contracts. They have been warned, however that if they do not comply, they stand the risk of losing Government contracts to companies that are compliant.

An emerging problem for the Government may be the attitude of foreign governments. For example, the U.S. trade representative for Africa has stated that BEE should not disadvantage U.S. companies doing business in South Africa. That may provide a lead for South Africa's trading partners to deal with BEE in their trade agreements with South Africa.

Influence of BEE on supply chains

While the "Maritime Transport and Services Industry BEE Charter" has been adopted by the industry, the effect on maritime supply chains is not yet evident. One obvious implication is that where existing supply chains and the construction of new supply chains depend on links that are owned or operated by companies in which the Government has a share, e.g. Transnet, development and innovation will have to accommodate BEE. If that cannot be achieved for whatever reason (for example, lack of expertise or mentorship,

lack of capital or reluctance by foreign investors to participate in enterprises without proven track records), maritime supply chains that are needed to sustain competitiveness in foreign markets may not come into being. On the other hand, the willingness of Government enterprises to promote BEE and the availability of funds for investment in BEE may well facilitate public-private partnerships in supply chain development that otherwise would not happen. By and large, however, any additional constraint on free enterprise such as the BEE Charter must constitute an inhibiting factor in the development of internationally competitive supply chains.

There is a serious lack of candidates with the requisite education and training for employment in the maritime industry in South Africa. In order to comply with the Maritime BEE Charter, large investments in schooling and training are essential, but much of that may not produce the intended outcome, mainly because employment in seagoing vocations requires personal affinity for the sea, which is uncommon among the black South African population – at least that seems to be the experience of most employers (Rennie, 2004). In any event there is a five to seven year process aimed at reaching the targets of the charter (Department of Transport, 2004). It should be noted that many of the senior positions in the South African maritime industry are occupied by ex-shipmasters and their qualifications and experience seem to be a career prerequisite for managerial advancement.

The lack of candidates willing to be trained for employment in the maritime industry also constitutes a major constraint on the ability of firms participating in maritime supply chains to adhere to the charter. Apart from an apparent lack of aptitude for marine learning, maritime entrepreneurship among South Africans is limited because the business community is largely unaware of the opportunities in the industry for profit and the risks. This is borne out by the fact that over 95% of cargo to and from South Africa is carried in foreign-owned ships (Department of Transport, 2004:4). Another problem encountered by firms in the industry aspiring to promote BEE is union inflexibility which detracts from the prospects of success of schemes to construct public-private supply chain enterprises employing existing state assets (Peat, 2005b:13).

An alternative more positive view is that the present participants not performing competently in supply chains, but protected by the lack of competition because of skills shortages will be replaced by new efficient BEE firms with newly trained and eager staff, assured of Government contracts and support. However, there is also the risk that firms which have participated efficiently in the supply chains could be ousted by inefficient BEE competitors because of their status and not their skills. This could result in major disruptions within chains and eventually job losses.

3.5 National Freight Logistics Strategy

According to the Minister of Transport, the National Freight Logistics Strategy issued by the Government in October 2005 “sets the framework for institutional reform and industrial structuring that will ensure a more efficient freight system” and creates “more space for the private sector to play a meaningful role in all aspects of the freight system”. However, the strategy is essentially interventionistic. The Government will retain majority ownership of critical infrastructure and remain responsible for network development and management through state infrastructure utilities and state-owned enterprises, although private ownership will be allowed to own and operate some infrastructure, but the design of the concession or whatever model is used for private sector involvement will take into account the impact on socio-economic development. Infrastructure that has a defined customer base and is suitable for management as a non-common user facility will fall into that category, but such non-common use will be the exception rather than the rule.

In clarification of the latter proviso, mention is made in the strategy (Department of Transport, 2005:38-39) of the Richards Bay Coal Terminal, which is highly efficient and privately operated as a link in the Mpumulanga – Richards Bay Coal line (see section 4.2.3), but functions as a cartel and charges rates for non-members, particularly black-empowered small producers, that are regarded as not affordable. As the terminal is supported by substantial public investment in the port and the rail link in the supply chain for

the export of coal, such investment according to the strategy has been made "at the expense of other investments with lower revenue and profitability levels, but with a larger impact on economic growth development". The issue at stake in the particular circumstances is whether the efficiency of the supply chain for coal exports should be traded-off for welfare considerations. As pointed out in section 7.13, commodity export supply chains in Australia, which compete directly with South African supply chains in world markets, are structured according to efficiency criteria only. Implementation of the National Freight Logistics Strategy might consequently constrain the structural development of South Africa's maritime supply chains solely to raise their competitiveness in world markets in favour of considerations of equity.

3.6 Overview

In this chapter, attention has been focused on the stakeholding of the Government in maritime supply chains through its ownership of Transnet, Ltd and on its intervention in the maritime sector by requiring a charter that promotes black economic empowerment in the industry.

The role of Transnet, in the maritime supply chain industry is presently a cause of lost opportunities in the export trade and it is accepted by the Government and the industry alike that solutions to its problems require participation by private enterprise. However, the prospects for such participation in order to improve maritime supply chain efficiency seem to be problematic in terms of the declared policy of the Government.

In Chapter Seven, the requirements for efficient maritime supply chain development are examined as well as the concept of, and scope for, public-private participation schemes, with the involvement of black economic empowerment. In the next chapter, Chapter Four, the most important maritime supply chains serving South Africa are described and discussed.

Endnotes:

1. "Die feit dat die spoorweë dus feitlik gedwonge is om hul beleid te reël ooreenkomstig die voorskrywing van die besondere politieke party wat aan die bewind is, is....." (Du Plessis, 1951:83).
2. In common with national railways worldwide.
3. The social obligations include responsibility for the actuarial deficit in the Pensioners Fund (Transnet Second Defined Benefit Fund). At the end of 2000/2001 financial year, this deficit had been reduced to R4.9bn. (Annual Report Transnet, 2001).
4. Universal sufferage in terms of the new constitution and the election to office of the African National Congress, the largest political party.
5. The inland terminal at City Deep operated by Spoornet will be taken over by SAPO (Enslin, 2005b:19).
6. The clause states that the Regulator may issue directives relating to the filing of prices charged by the provider of any port service *other than the Authority*. "Filing" enables complaints or appeals to be lodged with the Regulators. However, the Regulators must consider tariffs proposed by the Authority (clause 30(2)(d)), but whether "consideration" implies approval is not stated in the Act.
7. The Government has relied on many consultants from overseas to advise it on privatisation.
8. "....the simple notion that the private sector is more efficient and that the state should leave everything to it is fundamentally flawed in terms of theory, policy and citizen welfare" (Erwin, 2004).
9. Transnet maintains that the OREX-railway was a financial burden prior to the agreement with Kumba Resources operative from 1 January 2005 – see section 4.2.2.

CHAPTER FOUR

SOUTH AFRICAN MARITIME SUPPLY CHAINS

4.1 Introduction

In this chapter, the *generic characteristics* of the most important maritime supply chains serving South Africa are described as well as some of their unique features. Using *examples* of actual supply chains within South Africa these features are discussed in this and subsequent chapters in accordance with the elements identified in Chapter Two and the definitions given. The purpose of the analyses is twofold: Firstly, inherent strengths and weaknesses of several of the supply chains can be identified and discussed in the light of the problems of ownership and management encountered in practice. Secondly, structural impediments to South Africa's greater participation in global supply chains, in order to promote economic growth, can be more readily explained.

The supply chains described are two chains conveying bulk commodities (iron ore and coal) from mines in the interior to ports for shipping to steelworks and power stations overseas, several chains conveying imported and exported manufactured goods (motor vehicles and parts), one group of supply chains conveying exports of fresh fruit and the supply chains of containers moving through the ports. To some extent the descriptions overlap because some motor vehicles and parts and some fruit are containerised and others move as break-bulk.

The bulk supply chain for the export of iron ore is described in detail as its links typify the infrastructure, equipment and arrangements at modal interfaces that are needed to move large quantities of bulk cargo efficiently. While the nature of other cargo may differ and require handling, storage and movement in a particular manner, the features of the supply chain for iron ore are

generically the features of bulk supply chains, although some of the features may not always be needed while others may be more prominent. Each physical supply chain functions in tandem with a chain of documentation, which may differ altogether from chain to chain and which may be de-materialised and involve only electronic data transfer. A description of the documentation or electronic transmission that needs to function parallel to the physical operation of supply chains is not included in this thesis, because it is a topic requiring more extensive coverage than the length of the thesis allows. Nevertheless, it is emphasised that inadequate documentation can disrupt supply chains and delay the movement of cargo, especially when the consequence is non-compliance with the International Ship and Port Facility Security Code (ISPS Code) (see section 6.2).

The supply chains dealt with in all the examples involve the movement of cargo by sea as well as overland and can thus be described as intermodal maritime chains. None are owned and managed as an entity and therefore have integrated links only to the extent that the movement and transshipment of the cargo is controlled through the co-ordination of the flow and the sharing of responsibility for interruptions. Integration of supply chain links has, however, a variety of meanings that are also related to their ownership and management as well as their operational function. Apart from the physical integration of the links at their interfaces in the chain in order to achieve a seamless flow of traffic, supply chains can be integrated by pooling the profits and losses, or costs, among all the participants, or by the merging of ownership of all the assets or through alliances or in other ways. (The forms of integration and their benefits are dealt with in Chapter Seven).

4.2 Bulk supply chains

The South African economy depends heavily upon the export of ores and minerals, which are mined long distances from the country's ports. Transport and handling costs are consequently a major determinant of the f.o.b. (free-on-board) prices at which the commodities are invariably sold. In order to remain

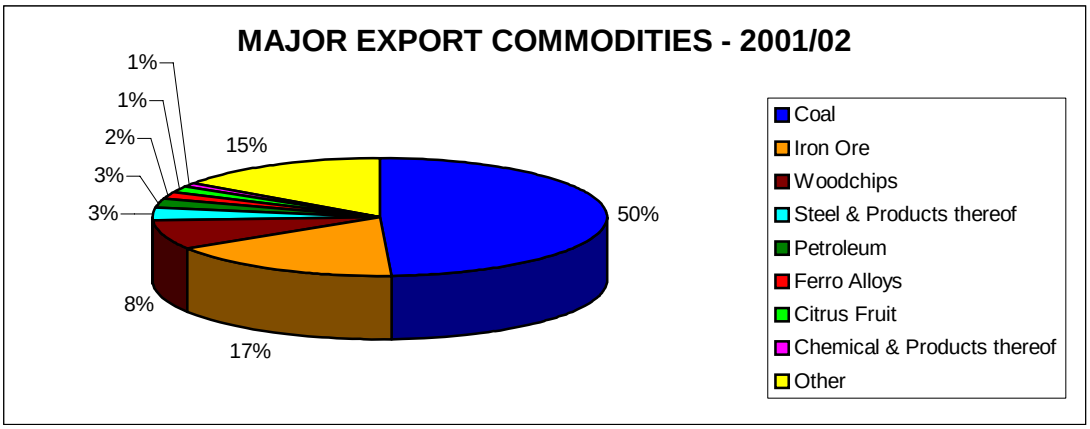
competitive in world markets, it is thus essential that South Africa's bulk supply chains function efficiently. Such chains usually involve substantial investment not only in infrastructure and equipment, but in the technological innovation needed to sustain competitive advantages. The structure of the links in the main bulk supply chains serving South Africa and the driving forces that will ensure their development in keeping with the demands of competition are thus an important topic to be dealt with in this thesis.

4.2.1 Overview of the bulk sector

Impact on the economy

Bulk exports by volume constitute by far the main cargo carried by South African maritime supply chains. Of the total bulk exports of some 129 million tonnes in 2004, 81 million tonnes moved through Richard's Bay and 28,5 million tonnes through Saldanha Bay (Department of Transport, 2004:44-65), which establishes those ports as the main destinations by volume of the overland supply chains operating in South Africa. Figure 4.1 illustrates the percentage of exports per commodity and shows that coal (50%) and iron ore (17%) are South Africa's main exports by volume. Most of the bulk comprises raw material (coal, iron ore, manganese ore and other ores and minerals) mined at deposits located far inland, and because of the volumes exported and the long distance of haul, requires the capacity and low unit costs of rail transport to render the trade financially viable.

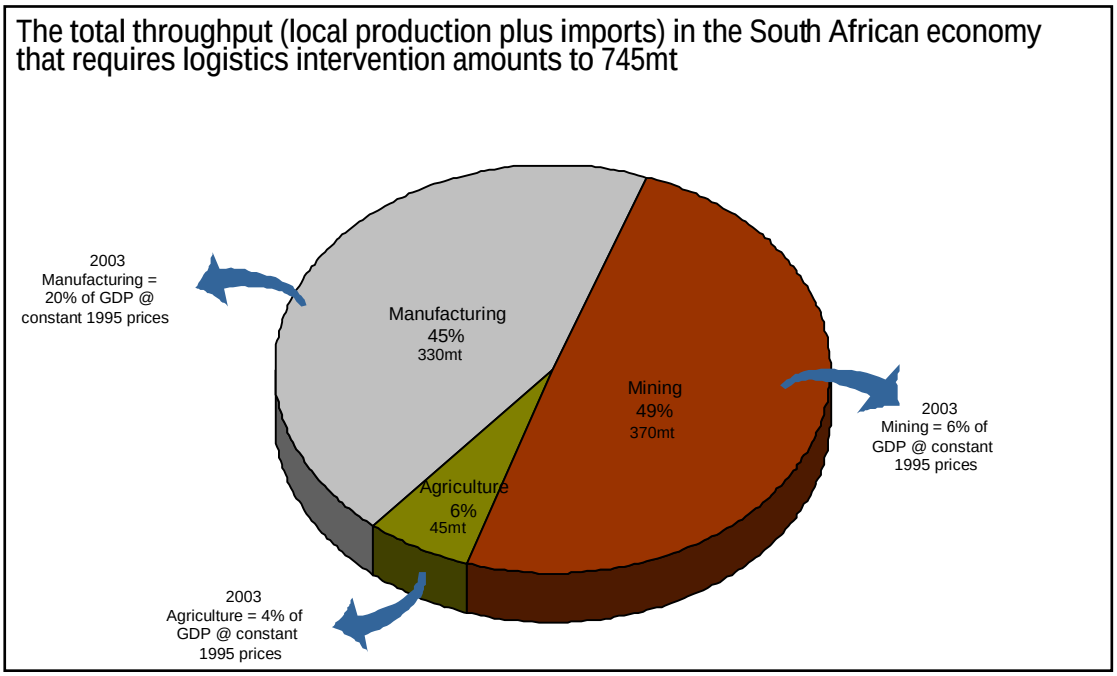
Figure 4.1: Major export commodities of South Africa (2001/02)[1)]
(Percentages of tonnage)



Source: National Ports Authority of South Africa, 2005.

According to Itmann (2005), even though the volume of mining materials (local production and imports) currently transported in South Africa is 370 million tonnes, while that of manufactured goods constitutes 330 million tonnes, the mining sector contributes only 6% of the GDP whereas the manufacturing sector accounts for 20%, (both at constant 1995 prices). These tonnages of goods, together with the mass of agricultural production comprising some 45 million tonnes contributing 4% of the GDP (at 1995 prices), as illustrated in Figure 4.2, constitute a measure of the logistics task in South Africa. Unfortunately, the detailed value of the investment in the infrastructure and equipment needed to fulfill that task is unknown[2)] and comparisons between each sector in terms of the fixed investment involved in the logistics task that it entails cannot be drawn. Petroleum, which is both imported and produced domestically, is not dealt with in the aforegoing and following discussion because the logistics of its transport is a specialised topic that falls outside the scope of this thesis on account of the extensive coverage required[3)]. The quantities involved are, however, included in “mining” and “manufacturing” in Figure 4.2.

Figure 4.2: Tonnage of freight transported in South Africa



Source: Itmann, 2005.

Technical description

As commodities exported in bulk from South Africa are usually, if not invariably, sold f.o.b.[4)], sellers may have little say in the deep-sea shipping arrangements and their responsibility for the chain of supply thus terminates when the cargo is loaded onto the ship, which may be chartered or owned by the purchasers or importers (Yuan & Hwee Ann, 2005). Responsibility for the onward movement of the cargo after loading in a port[5)] then devolves on the new cargo-owners, which means in practice that the transport of the cargo from origin to destination is organised in at least two independent sections of the entire chain. Arrangements sometimes exist to co-ordinate those sections through alliances or joint ownership of ships. In order to ensure the reliability and flexibility of their supply, some owners of bulk cargo also maintain stockpiles at strategic locations nearer ultimate destinations, which extends their involvement in the supply chain to incorporate the marine link (Cook, 2005).

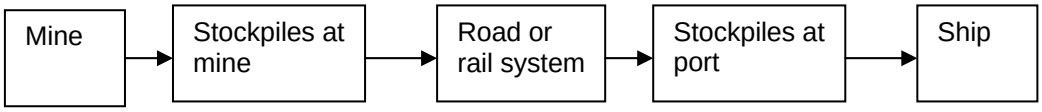
The links comprising the foreign-owned or managed sections of bulk supply chains are not dealt with in this chapter. That also applies to the foreign-owned or managed sections of supply chains for South African bulk imports purchased c.i.f[6)].

Typically the physical links in supply chains carrying bulk exports of ores or minerals require substantial fixed investment and will often comprise:

- the mine
- vehicles carrying the products in the mine (often diesel-electric trucks or trains)
- loading apparatus to build stockpiles
- beneficiation plant at the mine (e.g. washing plant)
- conveyors or other appliances to load rail wagons at the mine
- the railway system and road infrastructure between the mine and the port
- unloading appliances, conveyers and stackers to build stockpiles at the port
- reclaimers, conveyors and ship loaders for loading ships
- ships.

The usual physical features of a bulk supply chain are indicated schematically in Figure 4.3.

Figure 4.3: Physical features of a bulk supply chain



Source: Prepared by the author for the purpose of the study.

The marine leg of the supply chain commences with the loading of the ship and ends when the cargo is discharged at the port of destination of the voyage. Usually that port will be near or at the location of the manufacturing plant (e.g. power stations, steelworks) for which the cargo is intended and the overland links in chains carrying bulk imports may involve fewer elements than those needed in export chains. For example, the ore may be discharged onto conveyors feeding a stockpile, from which it is reclaimed and conveyed directly to the furnaces used in the production processes, all in the vicinity of ports.

Although the physical elements of the links in export supply chains as described are common to most chains, each chain is likely to also have individual or even unique physical features. There is also some commonality in the operation of bulk export supply chains that stems from the nature of their physical links, but there seems to be no typical ownership and management arrangements. The documentation required in the functioning of bulk supply chains is usually straightforward and dematerialised as the cargo moves mostly in terms of contracts and is shipped according to production schedules. In the following sections, two of the major South African supply chains feeding bulk exports to the ports are described.

4.2.2 Sishen-Saldanha iron ore supply chain[7)]

Description of chain and the participants

The export of iron ore mined in the Northern Cape via the OREX railway through the Port of Saldanha comprises the South African leg of a supply chain that then fans out to feed some 35 major steel producers in 16 countries, including China, Japan, South Korea, the United Kingdom, Germany, Australia and Italy (Kumba Resources, 2002). In order to ensure reliability and enable flexibility, stockpiles of the products of the mine are maintained at Qingdao in China and Constanza in Romania.

The physical links in the chain consist of:

- the open-pit mines in the Northern Cape Province
- loading apparatus and diesel-electric trucks operating in the mine
- the beneficiation plant at the mine
- stockpiles, conveyor belts and appliances to load rail wagons at the mine
- the OREX railway between Sishen and Saldanha
- the wagon tippler at Saldanha and the conveyer belt to the stockpiles
- stockpiles at the port with stackers and reclaimers
- conveyor belts and ship loaders
- ships.

The physical features of the supply chain are indicated schematically in Figure 4.4.

Figure 4.4: Physical features of the OREX supply chain

Mine → Mechanised shovels → Road trucks → Stockpile with stackers →

Rail wagon loader → OREX Railway → Tippler →

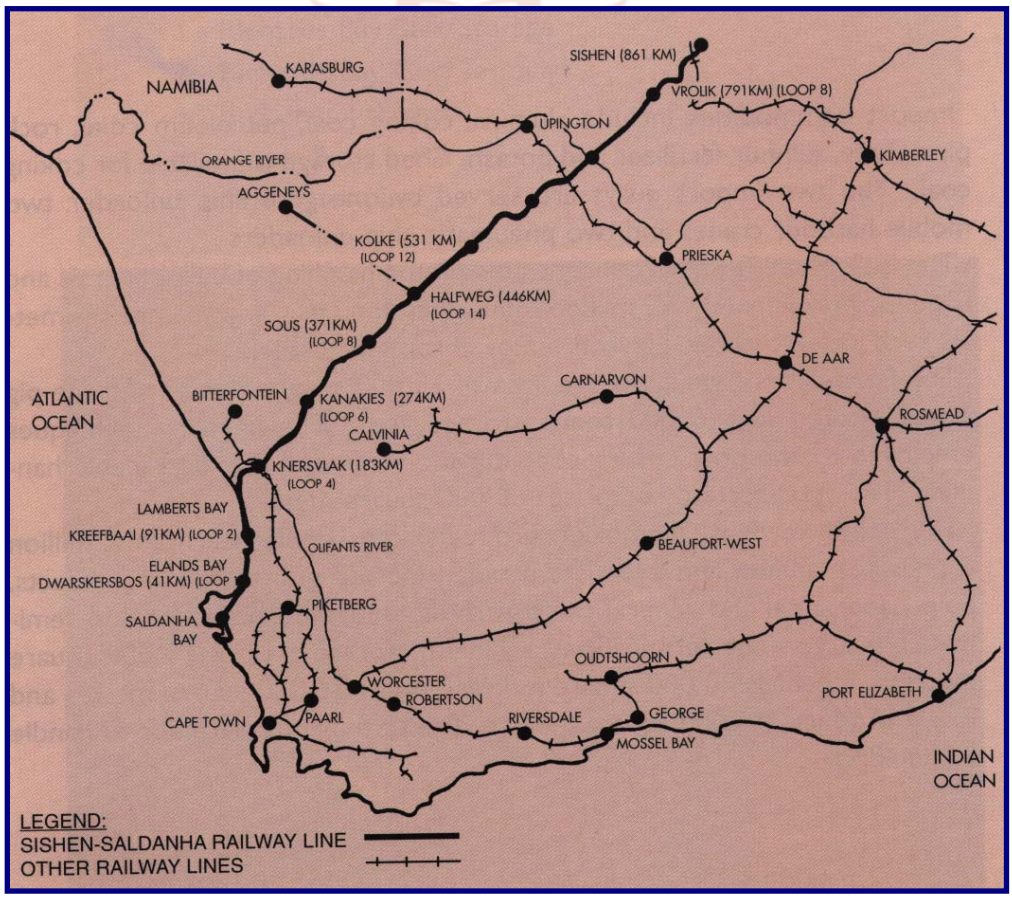
Conveyor belt → Stockpile with stacker → Reclaimer →

Conveyor belt → Ship loaders → Ship

Source: Prepared by the author for the purpose of the study.

A map of the rail route is shown in Figure 4.5.

Figure 4.5: Map of iron ore supply chain



Source: Department of Trade and Industry, 2000.

Iron ore mine at Sishen

The open-pit mine of Kumba Resources at Sishen is one of the world's largest iron ore mines. Sishen is located in the Northern Cape Province, 280 km north-west of Kimberley and some 860 km north-east of the Port of Saldanha, through which 80% of the mine's current annual production of 27 million tonnes (in 2002) is exported. An increase in production to 36 million tonnes is planned (Van Dyk, 2002). The expected life of the mine is more than thirty years as the total of the mineral resource is 1 758 million tonnes.

The mining process takes place in a long open pit with a width of about 1,5 kilometres and depth of 375 metres and operates in the following sequence: drilling, blasting, separation of ore from waste material, loading and hauling. Electric shovels and large front-end loaders are used to load the ore into diesel-electric trucks with carrying capacities of 170 and 190 tonnes, which haul the ore up the ramps of the mine to the plant where it is beneficiated and graded for stockpiling in the following sequence: crushing, washing and screening, heavy media separation, blending and loading onto stockpiles via conveyor belts. The ore is reclaimed from the stockpiles onto conveyor belts, blended and loaded into the train wagons.

A new mine at Sishen South, located 70 km south of the Sishen mine, is being developed to produce about 10 million tonnes per year from 2005 onwards for about 27 years (Kumba Resources, 2002).

Assmang

Kumba Resources is not the only producer of iron ore using the OREX-railway. Assmang also exports ore through Saldanha in terms of contracts with Transnet or its divisions (Van Staden, 2004). The business chain using the OREX-railway has one common ISO 9002:2000 listing which includes all the role players as a partnership in principle.

OREX-railway

The OREX-railway used to transport the iron ore from the mine at Sishen to the Port of Saldanha over a distance of 863 km was completed in 1976 and was originally dedicated to that purpose. Since then, lead, copper and zinc concentrates from Aggenys are also carried on a section of the line to the Port of Saldanha and in 1994 a link to the Bitterfontein railway line was built to accommodate the products from Namakwa Sands at Koekenaap (Sishen-Saldanha Bay Railway Construction Amendment Act 72 of 1976). Technically, the infrastructure and equipment of the railway are highly sophisticated and many of its features are the unique outcome of problems attributable to the narrow gauge of the railway, i.e. 1,065 metres and the 26 tonne axle-loading of the wagons comprising the train (Van Dyk, 2002).

The trackwork is differently constructed to that of other rail tracks in South Africa, as chrome-manganese rails and prestressed concrete sleepers are used in order to carry the mass of the trains and so avoid excessive maintenance and repair costs. The railway is fully electrified at 50KV.AC and centralised traffic control is employed for train operation. It is believed to be the longest iron ore railway in the world.

The trains consist of between 211 and 216 wagons hauled by three type 9E electric locomotives and one type 34 diesel locomotive. There are two different types of wagons in the OREX fleet, i.e. 85-tonne and 100-tonne wagons. The length of a wagon is about 10,5 metres, which brings the train lengths to 2 268 metres, excluding the locomotives (Van Dyk, 2002).
The total mass of each train differs depending on its composition. The following combinations are used (Van Dyk, 2002):

- 216 wagons x 85 tonnes = 18 360 tonnes
- 108 wagons x 85 tonnes + 108 wagons x 100 tonnes = 19 980 tonnes
- 216 wagons x 100 tonnes = 21 600 tonnes

The railway consists of a single line with 19 planned interloops of 3 000 metres in length that enable the crossing of trains to take place ‘on the fly’, i.e. without stopping. Only 10 interloops have so far been built. The maximum number of trains that can depart from Sishen in 24 hours is 16. Communications between the mine, port and train drivers is achieved through a microwave and VHF radio system.

Port of Saldanha

The Port of Saldanha is situated on the south-west coast of Africa in the deepest and largest natural harbour in southern Africa, with a maximum draft of -20,5 metres (National Ports Authority of South Africa, 2004:165). The port is partly protected by an artificial breakwater.

The land and sea covered by the jurisdiction of the Port Authority totals 18 300 hectares. Port facilities for handling iron ore consist of a 990 metre long jetty with two iron ore berths. Although the jetty can accommodate two vessels, it can load only one at a time. Ships with beams of less than 30 metres are not accepted because of the reach of the loading appliances.

On the arrival of an ore train at Saldanha, it is separated into two equal parts, the reason being that the maximum feed capacity of the tippler is 108 wagons. The positioner positions two wagons at a time into the tippler, which tips the wagons causing the iron ore to fall onto the conveyor belt below. The tippler returns the wagons to their normal position and the positioner moves the next two wagons into the tippler. The duration of this process (from the start of the positioning to the end of the tippling) takes 72 seconds (Van Dyk, 2002).

The iron ore moves on conveyor belts onto stockpiles, totalling 3,5 million tonnes and occupying 13 hectares, from which it is reclaimed by means of the reclaimer and moved onto a conveyor belt to the sampling plant, where the moisture content is tested before loading. From there, the iron ore moves via a seven kilometre long conveyor belt at a speed of four metres per second to the

capacity stackers and ship loaders that enable loading of a ship at an average of 7 000 tonnes per hour, with peaks up to 10 000 tonnes per hour. The average loading time of a ship is 27,8 hours (Van Dyk, 2002).

Ships

The ships used to carry the ore are usually large (Cape size) ore carriers of between 150 000 and 180 000 dwt, as it would be uneconomical to use smaller ships regularly for the ore exports (Van Dyk, 2002). An average of 215 vessels leave from the Port of Saldanha in a year (National Ports Authority of South Africa, 2004:161).

System ownership and management

Apart from the technical characteristics of the Sishen-OREX-Saldanha iron ore supply chain which enable high quality iron ore to be delivered to customers throughout the world at competitive prices, the features of the supply chain are the separate ownership and management of the mine, railway and port. Although Spoornet, responsible for the railway, the National Ports Authority, responsible for the port, and South African Port Operations, responsible for the handling of the cargo in the port, are divisions of Transnet Ltd, they function as separate entities with their own budgets under the supervision of Transnet and the State (Ramos, 2005). While the extent of the co-ordination achieved in the huge investments needed at the outset in the mine, railway and port may seem to be remarkable, it should be borne in mind that the entire iron ore export scheme was initially conceived, planned, financed and implemented by the Iron and Steel Corporation of South Africa (ISCOR), which was owned by the Government at the time. It was only when the scheme became a serious financial embarrassment for ISCOR, which could no longer afford the losses, that the railway was taken over by the predecessors of Transnet on instruction from the Government. That the scheme then survived and has since become a profitable venture for Kumba Resources, successors to ISCOR, is attributable

to the write-off by the Government of the capital investment in the rail and port infrastructure (Act 77 of 1976, Act 47 of 1977, Act 80 of 1979) and to some extent good fortune in the recovery of the demand for the product in the market.

The purpose of relating this history is to explain that it was conserved as a fully-integrated supply chain including the mine and account for its current viability, which involves the transport of iron ore over a longer distance by rail than seems to be financially feasible elsewhere in the world[8)]. It also raises the question of whether the scheme could bear the cost of the renewal of the rail equipment which will be necessary before the expiry of the lifetime of the mines. Transnet contends that OREX has been a financial burden until recently because the revenue it received for carrying the ore was priced in US dollars and thus depended upon the exchange rate, and that consequently its role under the terms of the agreement with the cargo-owners was unsustainable. After years of negotiation, a new agreement from 1 January 2005 between Transnet and the mine owners, Kumba Resources, was concluded in March 2005, whereby the latter is allowed to expand the output of the mines to 38 million tonnes by 2009 (at a cost of R2,96 billion) and Transnet will invest R1,83 billion in order to raise the rail and port capacity (Ramos, 2005). The ore will be carried at a rand-based tariff and the agreement will extend for 23 years, with tariff-reviews every five years (Macharia, 2005:1). Whether the new agreement will result in the sustainability of the supply depends not only on the future financial viability of Transnet, but also on the demand for iron ore, particularly by China (Macharia, 2005:1) and shipping rates.

While the profits attributable to the National Port Authority are presently substantial, the dependence of Transnet on those profits and the effect of the proposed concessioning of public port terminals to private enterprise (if that ever comes about) or through public-private participation schemes are causes of uncertainty on whether ongoing investment to maintain and improve the facilities in the Port of Saldanha will actually be forthcoming as needed. This

topic is pursued in Chapter Seven. Improvement will be essential if the volume of ore through the port is to be raised as planned by Kumba Resources.

In summary, the infrastructure of the iron ore supply chain belongs to:

- Mines: Sishen Mine – Kumba Resources
  Beeshoek Mine – Assmang (Pty) Ltd

- Rail line: Spoornet with Transnet as its holding company

- Port equipment: South African Port Operations with Transnet as its holding company

- Land, infrastructure and marine equipment in the Port of Saldanha: National Ports Authority with Transnet as its holding company (Van Staden, 2004).

These participants and South African Port Operations conduct the function of the chain as one operation, but without cost or profit-sharing. The technical issues are addressed at different forums, but no financial issues are discussed. The different levels of the forums are as follows:

- *Strategic forums* to discuss expansion, contracts and other relevant subjects at top management level.
- *Management forums* to manage the business chain in accordance with decisions of the strategic forum, but also to initiate continuous improvement projects,
- *Channel teams* which are responsible for Service Level Agreements (SLAs), ISO systems for the business chain, short and medium-term planning and management of the chain; and
- *Operational teams* to manage the day-to-day operations.

The aim of the organisational structure described is to ensure the maximum utilisation of capacity and infrastructure and efficient competition in the supply of iron ore in the global market.

Management of the different links in the supply chain is the responsibility of different managers within divisions of Transnet, but in effect those links operate or are intended to operate as one unit, although not as one profit-making business. Included in the SLAs are guaranteed volumes with bonus and penalty clauses to take care of variances. Sales contracts are the responsibility of the mining companies with no obligations toward the Transnet business units concerned with managing the links. The mining companies are responsible for the arrangement of shipping in collaboration with buyers as the cargo is sold free-on-board (f.o.b.).

Future developments

In order to overcome the present limitation of rail capacity for the export of the ore, different plans have been conceived. Apart from the ongoing negotiations between Spoornet and Kumba Resources, Spoornet has tested a “mega train” on the line between the Northern Cape to the port of Saldanha (Ndzimela, 2004a:4). The train is 3,9 kilometres in length with a payload of 34 200 tonnes, which could raise the current line throughput of 29 million tonnes to 41 million tonnes per annum if such trains were to be operated regularly.

Another plan conceived by Spoornet to relieve the capacity shortage on the line is to construct a similar supply chain through the Port of Maputo (Ndzimela, 2004b:4). The idea is for that chain to be used to export between five and ten million tonnes of ore per year. The feasibility is still being examined.

The latest development is the new agreement between Spoornet and Kumba Resources, which came into operation retrospectively from 1 January 2005, and which is intended to render the supply chain profitable for both Transnet

and Kumba Resources, in contrast to the previous arrangement that Transnet considered to be unsustainable.

The Sishen-Saldanha iron ore bulk supply chain has been dealt with in some detail in this section in order to illustrate the scale of the venture and its physical complexities, as well as to explain the role of Transnet and its huge stakeholding. If the export of iron ore is to be expanded as the line owners envisage, it is obvious that Transnet will need to invest substantially in additional infrastructure and equipment and to share in the risks of trading in the volatile commodity market. Whether the acceptance of such risk is appropriate for a state-owned enterprise or, rather, whether the venture has reached a scale that no longer renders acceptance of the risk appropriate and whether the mine owners can rely on Transnet to continue to invest is considered in Chapter Seven. In Chapter Five, by way of comparison, a description is given of a competing iron ore supply chain in Australia that operates on a much vaster scale than the Sishen-Saldanha iron ore supply chain, but is entirely privately-owned.

4.2.3 Coal line

Brief description of chain and the participants

The Port of Richards Bay is regarded as the largest port in South Africa as it handles more than 57% of South Africa's seaborne cargo by volume (National Ports Authority of South Africa, 2004:29). Of the exports, some 68 million tonnes per year presently comprise coal (National Ports Authority of South Africa, 2004:34). With further development, an expansion of the Richards Bay Coal Terminal at the port will allow coal exports to rise to 82 million tonnes per year.

The “Coal line Railway”[9)] (Coal line) starts in the Mpumulanga province where 44 coal mines feed the railway, which stretches a distance of 580 kilometres through KwaZulu-Natal to the Port of Richards Bay (Spoornet, 2005).

The elements in the coal supply chain are:

- Forty-four coal mines in Mpumulanga
- The Coal line railway
- The Richards Bay Coal Terminal
- The Port of Richards Bay

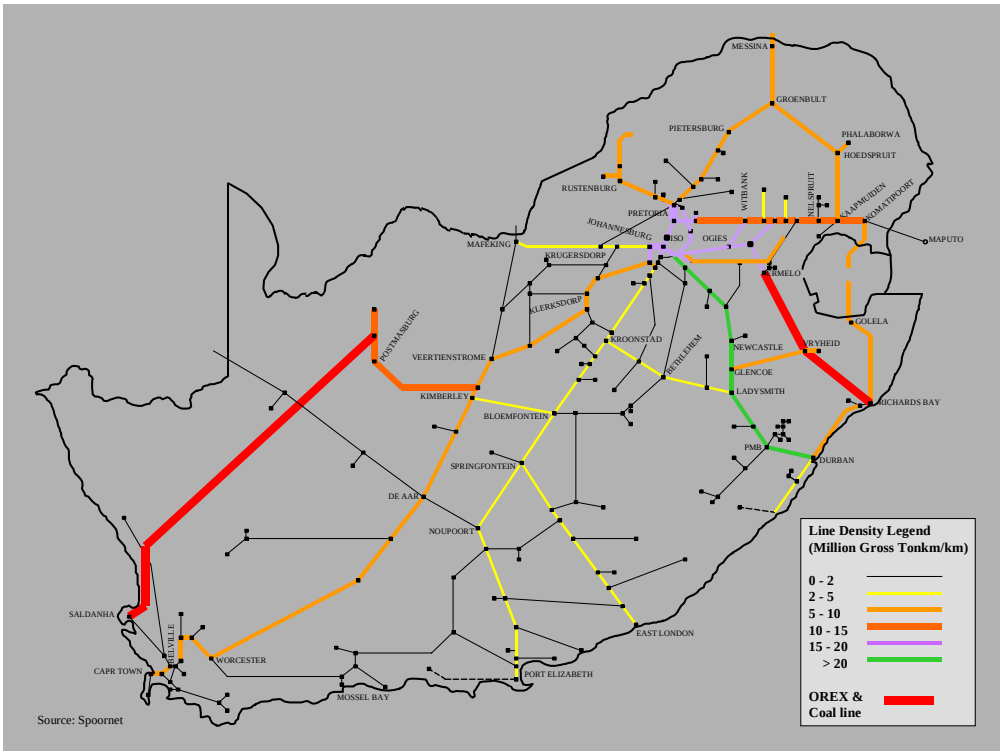
The 44 mines in Mpumulanga are very rich in coal and if the capacity of the Richards Bay Coal Terminal and the Coal line were to be raised, the mines could readily increase their production and expand exports, given that markets exist. From the mines, the coal is conveyed to Ermelo as a central gathering place. There it is loaded onto the trains for transport to the Port of Richards Bay for export.

Construction of the Coal line started in 1976, and was finally completed in 1989. It includes 37 concrete-lined tunnels and 137 bridges (Spoornet, 2005). Two 100-wagon trains are coupled at Ermelo to form one 200-wagon train. The train is 2,5 km long and comprises 20 800 gross tonnes. The wagons are known as rotary dump wagons and two sizes are used, a 58 tonner and an 84 tonner jumbo, with a 26-ton axle load (Spoornet, 2005). The locomotives used on the line for the transport of the coal are 54 class 10E direct current and 112 alternating current electric locomotives (Spoornet, 2005). The double line is bi-directionally signalled and fully electrified. At the marshalling yard at Ermelo, the current is switched from direct current to alternating current for the journey to the port. The trains are controlled by 1 900 signals and 860 sets of points, from four centralised traffic control centres along the route (Spoornet, 2005).

Once trains reach the port, the coal is off-loaded into covered storage facilities or bin storage, from where it is reclaimed and loaded into the bulk ships that

usually carry 150 000 dwt. Most exports are to Europe (Spoornet, 2005). The Coal line is shown on the map in Figure 4.6 as well as the OREX- railway.

Figure 4.6: Map of railway lines in South Africa, showing the two bulk railways



Source: Pojie, 2005.

Ownership and management

The ownership and management of the Coal line are similar to that of OREX, with the exception that the coal terminal at the port is owned and operated by a private undertaking comprising several mining concerns (Merit, 2000:20). Thus, only the rail infrastructure and equipment as well as the port are owned, managed and operated by Transnet.

Future developments

The Coal line is an outstanding example of engineering expertise, and there are further plans to improve the system. Sophisticated equipment has been installed on a Coal line test train to evaluate new train technology in the form of electronically controlled pneumatic braking with distributed power. Distributed power enables a single-manned front locomotive to be linked to an intermediate or end locomotive that is then remotely controlled. That will be a unique technological advance. Another advance is the testing of an acoustical hot axle journal detector.

Other technological improvements that have passed the testing phase include:

- An automatic vehicle identification system consisting of a transponder on each vehicle, which is read by a fixed or hand-held reader, as it passes. That facilitates accurate vehicle tracking and operational control.
- A state-of-the-art GSM cellular phone communications system on the trains and on the line via fibre-optic cables.
- The fitment on all locomotives of global positioning systems (GPS) for the purpose of Integrated Train Control Monitoring, which also entails a series of wayside stations that continually monitor the condition of the rolling stock.

The capacity of the Coal line will be raised to 80 million tonnes per year through project investment by Transnet estimated at R4,79 billion (Ramos, 2005).

Challenges for bulk supply chain development

According to Itmann (2005), distribution/transport, warehousing, inventory holding and administration costs in Africa are among the highest in the world and impede trade. The supply chains developed in South Africa for the movement of bulk commodities through the ports are technologically advanced

and are perhaps exceptions to that contention, but there can be no doubt that the long distances of haul from the sources of raw materials to the ports constitute an ongoing challenge for the participants in the supply chains in their competition with shorter and less costly supply chains in other countries. The challenge is compounded by State ownership and management of the railways and ports, which in recent years has been accompanied by under-investment in infrastructure, lack of capacity and high labour costs. According to the Chamber of Mines, "SA's bulk commodity exporters have been unable to respond to the demand created by the global commodity boom because rail capacity and port infrastructure are inadequate. Spoornet is providing a deteriorating serviced to its customers – it appears unable to solve its problems on its own" (Fraser, 2004b). Mining companies are consequently seeking "every imaginable way to boost rail capacity" so that they can mine and export more ore, taking advantage of the China led commodities boom (Fraser, 2004b; Faniso, 2004:3).

Although Transnet has announced plans for raising rail and port capacity (Ramos, 2005), it seems that the recent decision by the Government of China to remove its incentives to domestic producers of steel for export will reduce the demand for the import of the raw materials (Neill, 2005:10). The decline in demand has already become manifest in the drop in the charter rates for Cape size ships according to Van Niekerk of Clarksons in London (2005). Whether the lower demand for iron ore in the world market warrants the reconsideration of the expansion planned by Transnet and the mine owners is not yet known.

Although Ramos (Faniso 2004:3) has admitted that lack of infrastructure, lack of rail and port capacity and, by implication, lack of integrated management (as summarised by Itmann, 2005), are current problems that stem from neglect of its transport enterprise by the State, it should be borne in mind that Transnet has tended to be reactive in the development of supply chains. It could hardly be otherwise, as the supply of raw materials in bulk for world markets requires substantial investment in infrastructure and equipment involving risks that can justifiably be undertaken only with an in-depth knowledge of the international trade in commodities and foresight of the

business opportunities over the long term. The inadequacies of which they complain may therefore stem from their failure to establish their needs for rail transport timeously in a manner that justifies the public investment required, or at least in a manner that could receive political approval in accordance with the budgeting procedures with which Transnet, as a state-owned enterprise, must comply.

As competition in the world markets for iron ore and coal depends largely on supply chain costs, it is essential for competing chains to minimise their unused capacity by coordinating the upgrading of the links in accordance with the demand. When projects to raise the output of the links must be identified and managed by individual participants in the chain, co-ordination may not be achieved, especially when the participants comprise public as well as private enterprises, because of procedural differences in planning, financing and implementation. For example, large new works by Transnet require budgeting provision in accordance with annual timetables and procedures that are lengthy and subject to political oversight at various stages, as well as public audit. That requirement seems to underlie the inability of South African exporters of the ores and minerals to respond adequately to short-term fluctuations in the demand (Itmann, 2005). As private undertakings are responsible only to their shareholders and not the public generally, they can usually respond quickly to the need for investment in their own infrastructure, when that is justified by an increase in the demand for their products.

The problem of inadequate rail capacity in the supply chains of bulk exports could be avoided through the integration of the ownership or at least the investment responsibility for the development of the mines and the handling and transport facilities to load the cargo onto ships. As described in Chapter Five, such integrated ownership or control of bulk supply chains has successfully been achieved elsewhere in the world.

In this section, South Africa's major bulk supply chains have been described with emphasis on the elaborate infrastructure and large investment needed to sustain their competitiveness in world markets. The main problem with their

further development is identified as that stemming from public ownership of the rail link in the chains, which is dealt with more specifically in Chapter Seven. The discussion of supply chain integration is also pursued in that chapter and the concept of supply chain leadership is introduced.

4.3 Manufacturing supply chains[10)]

Exports and imports of automotive industry

The automotive industry is the largest manufacturing sector in South Africa and the main exporter of manufactured products (South Africa.Info, 2003). The industry is ranked 19th in the world production of vehicles and employs 260 000 people (Poggiolini, 2004:33). South Africa's economy thus depends substantially upon exports by the automotive industry and the organisation of transport of their products to the ports is, therefore, an important topic to be discussed in this thesis. The industry is responsible for the manufacturing of approximately 80% of Africa's vehicle output and produces approximately 0.6% of the 50 million vehicles manufactured worldwide each year (Richardson, 2005a:10). Major motor vehicle production operations are located in the vicinities of Port Elizabeth, Durban, East London and Pretoria. The companies producing vehicles are BMW, Daimler Chrysler, General Motors, Fiat, Ford Motor Corporation, Nissan, Toyota and Volkswagen. However, including imports, virtually all makes of vehicles traded worldwide are sold in South Africa.

Apart from the export of motor vehicles, South Africa also imports vehicles both fully built-up and in knocked-down form. In Table 4.1 the volume of South Africa's sales, exports and imports of motor vehicles in 2000 - 2005 are shown. Motor vehicle components are also exported and imported.

Motor vehicle terminals

Most, but not all, of the factories are located near ports and the need to construct supply chains with integral management of the links in order to control the movement of their cargo does not seem to have arisen. The motor vehicle terminals at the ports are in effect car parks that serve as buffer storage for imported and exported vehicles driven or carried by road vehicle carriers between the factories and the terminals (Mawson, 2005). Vehicle components move differently. They are invariably packed into containers and their transport occurs within the organisation of container supply chains (Anon, 2005a:10). Some motor vehicles are also transported in containers.

Although the car terminals at the ports are essentially car parks (Mawson, 2005), control of the throughput of vehicles has become increasingly sophisticated in order to co-ordinate it with the loading or unloading of the ships (which are usually specialised vehicle carriers) as the volumes have increased. The functions of the car terminals differ: that at Durban, which is the largest car terminal in South African ports (National Ports Authority of South Africa, 2004:52) is not dedicated to any one vehicle manufacturer, but is a "common user" terminal serving all motor vehicle exporters and importers. As such it is similar in function to other common user terminals and does not constitute a link in a specific integrated supply chain. That also applies to the facilities for the loading and offloading of vehicle exports and imports at Port Elizabeth and Cape Town.

The terminal at Durban not only accommodates new vehicles, but acts as a transshipment port for a large number of second-hand imported vehicles intended for other destinations in Africa, as South Africa prohibits the import of second-hand cars for use in the country. It also accepts the loading and discharging of abnormal heavy loads such as earth-moving equipment, often in conjunction with motor vehicles (Naicker, 2005). A major expansion of the terminal at a cost of R100 million was completed in 2004 and its design capacity is now 220 000 units per year (Naicker, 2005). The terminal facilities comprise a single berth with a 366 metre quay and a depth alongside of -10.9

metres, backed by an area of 8.5 hectares for storage with logistical road and rail access, vehicle inspection facilities, and an administrative block. The area is surrounded by high security fencing. The dedicated berth is able to accommodate the largest deep-sea car carriers afloat, and has an average of one call every day with cargoes that can reach 2 000 vehicles at a time (Naicker, 2005). With the total throughput of the terminal divided into 60% imports and 40% exports, the facility has been carefully laid out to enable an efficient, supervised loading and discharge operation to and from vessels as well as rail trucks delivering directly to and from manufacturers (Naicker, 2005).

Table 4.1: Domestically produced and imported motor vehicles: 2000 – 2005

	2000	2001	2002	2003	2004	2005
	Actual				*Projections*	
CARS						
Domestically produced						
Local sales	173 373	172 052	163 474	176 340	200 000	210 000
CBU exports[1)]	58 204	97 599	113 025	114 909	113 000	150 000
CBU imports[1)]	61 749	79 508	78 128	81 919	116 000	140 000
Total market	234 122	251 560	241 602	258 259	316 000	350 000
LIGHT COMMERCIALS						
Domestically produced						
Local sales	104 121	113 111	101 956	102 007	116 000	125 000
CBU exports[1)]	9 148	10 229	11 699	11 283	11 000	25 000
CBU imports[1)]	4 114	4 535	5 291	5 377	7 000	9 500
Total market	108 235	117 646	107 247	107 384	123 000	134 500

MEDIUM & HEAVY COMMERCIALS						
Domestically produced						
Local sales	11 725	12 693	13 705	16 327	18 500	20 500
CBU exports[1)]	679	465	582	469	500	500
CBU imports[1)]	550	630	630	630	650	700
Total market	12 275	13 323	14 335	16 957	19 150	21 000

Source: NAAMSA Annual Report, 2004.

Note:

1. CBU: Completely built-up unit.

The specially designed dedicated multi-level car terminal in the Port of East London, which is directly connected to the manufacturing plant of Daimler Chrysler via multiple bridges is in contrast to the other car terminals an integral link in the export supply chain of that company (National Ports Authority of South Africa, 2004:83-87). Most of the exports are Mercedes-Benz C-class cars to Australia, South East Asia and elsewhere, while the remainder of the exports of Daimler Chrysler are Mitsubishi Colt pick-ups for African customers (Trade and Investment South Africa, 2003:23). The terminal is also accessible by rail and road for other South African manufacturers with import/export requirements (National Ports Authority of South Africa, 2004:83-87). The multi-level facility can store up to 2 800 vehicles and has a throughput of 50 000 units per year. Special attention has been given to safety, security and protection from natural elements. The facility also includes an 8 200 square metre area for the containerisation of vehicles for export, as well as a 12 200 square metre administration area where imports can be inspected and cleared for customs. From the multi-level facility, the cars roll directly onto the specialist car carrying ships.

Nissan imports and exports

Two South African motor vehicle manufacturers are located inland at Rosslyn near Pretoria, namely Nissan and BMW, and their imports and exports need to

be transported over long distances. Both companies import knocked-down vehicles and components in containers through the Ports of Port Elizabeth and Cape Town and export fully built-up vehicles through the Port of Durban. The use of containers for imported vehicles by Nissan and BMW avoids the use of specialised RoRo carriers that Daimler Chrysler and most of the vehicle manufacturers rely on for export. One of the major disadvantages of carrying vehicles by RoRo ships is that such ships are slow as a result of their design and voyage times are long. When the ships reach destination ports, customs inspection, which is usually very strict when the cargo comprises complete motor vehicles, is time-consuming. Another problem with RoRo ships is that their off-loading is dependent upon weather conditions as the ships have to lie very still in order to allow the vehicles to be driven off (Van Vuure, 2004). In general, transport of vehicles in RoRo ships is uneconomical because of the low density of the cargo. With containerisation, the transport of vehicles by sea is considered to be easier, cheaper and less time-consuming by some but not all manufacturers.

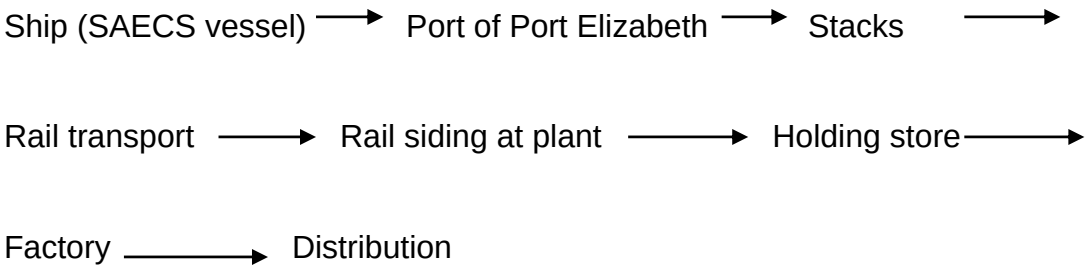
The production and manufacture of the fully built-up vehicles imported by Nissan to South Africa takes place in Europe, where the factory relies on different supply chains for its supply of parts, sourced from anywhere in the world e.g. wheels, axles, radios, windscreens, body panels. Production is essentially globalised, which means that products are manufactured by a network of firms, each specialising in a part for the production process (Trade and Investment South Africa, 2003:29). The firms that form part of the overall supply chain do not need to be in close geographic proximity to each other and the different stages of production are thus distributed throughout the world.

After a vehicle has been fully assembled, but not finally painted, it is ‘completely knocked down’ (CKD) and packed into a container with special packaging. A container can either be filled with a few CKD cars or if a bulk consignment is exported, different containers can be filled with only one type of part e.g. windscreens. The packaging of the containers is important and is specialised in order to ensure safe transport (Anon, 2005a:10).

After arrival at the Port of Port Elizabeth, the CKD containers are off-loaded into stacks, and reloaded onto dedicated block trains consisting of 50 wagons and railed to the re-assembly plant of Nissan at Rosslyn (Nissan, 2005), which has its own railway siding with handling equipment for the loading and off-loading of containers. Two to three trains move between the port and plant per week. At their destination, the containers are moved into a holding warehouse for unpacking. At that stage all the locally manufactured parts are already at the plant and assembly commences. The colour of cars is decided at the plant and the cars can be individually customised. From there, the finished product is distributed by road to southern African destinations. Exports of fully built-up units are carried by car transporters to the terminal in the Port of Durban for loading onto RoRo carriers. Car parts are exported in containers moved by road to Durban.

Only the imports of Nissan move in a controlled supply chain, the participants in the chain are illustrated in Figure 4.7.

Figure 4.7: Participants in Nissan import manufacturing supply chain



Source: Prepared by the author for the purpose of the study.

Each participant in the chain is responsible for the management of its link in order to ensure that the supply chain functions as smoothly as possible, but Nissan supervises all the participants so as to ensure that the quality of the service is maintained. To ensure that the bookings on board the ships are

given priority, the chosen carrier has an employee at Nissan's offices to deal with problems.

The ownership of the infrastructure is presently as follows:

- Shipowner: P&O Nedlloyd Limited
- Port of Port Elizabeth: Infrastructure is owned by National Ports Authority; South African Port Operations owns and manages the handling equipment; both are divisions of Transnet.
- Rail transport: Operated by Spoornet as a division of Transnet.
- Rail siding, holding store and factory (Nissan plant): Owned by Nissan.

BMW imports and exports

The containerised components imported by BMW for the manufacture of cars are carried by the Mediterranean Shipping Company (MSC) from England and Germany to the Port of Cape Town and then by rail on dedicated block trains with a capacity of 50 wagons carrying 100 containers each, which leave twice weekly for the factory at Rosslyn in Gauteng (Hendricks, 2005). The supply chain is organised to function just-in-time, but although Spoornet is committed to complete the rail journey of some 1600 kilometres in 36 hours, MSC which is responsible for delivery to the factory, schedules 48 hours for rail transit to provide for delays. MSC allows altogether 3 days for offloading in the Port of Cape Town, rail transit and offloading at its depot in Rosslyn (Hendricks, 2005).

Delays occur mainly because rail traction must be switched several times between diesel and electric locomotives, at Bellville, Beaufort West and Kimberley. As the freight is particularly vulnerable to theft while the switching takes place, flat-bed wagons, which are sometimes included in the

composition of the trains, are left unloaded or detached from a train in favour of wagons with sides (“bathtubs”), which preclude access to the containers unless they are hoisted out of the wagons (Hendricks, 2005). In order to maintain the just-in-time delivery of the components in the event of long delays, MSC maintains a buffer stock at its depot in Rosslyn (where the unloading of trains take place).

The just-in-time transport of the components from England and Germany to the BMW factory at Rosslyn constitutes a typical maritime supply chain of manufactured products controlled by a shipping line, although the reliance on Spoornet for the haulage by rail between Cape Town and Rosslyn constitutes a weakness insofar as MSC cannot intervene in the rail operation or use of rail equipment. Improvement of the rail link in the chain would be essential if the manufacture of cars is to be expanded as envisaged (Hendricks, 2005).

The ownership of the infrastructure and equipment of the BMW import supply chain is presently as follows:

- Shipowner: Mediterranean Shipping Company
- Port of Cape Town: The infrastructure is owned by the National Ports Authority; while South African Port Operations owns and manages the handling equipment. Both are divisions of Transnet.
- Rail transport: Operated by Spoornet as a division of Transnet.
- Rail depot in Rosslyn: Owned and operated by MSC.
- Holding store and factory (BMW plant): Owned by BMW.

The export of the completely-built-up-units (CBU) is not conducted as a controlled supply chain although the vehicles are tracked. Rail car carriers are used to move the CBUs to the Port of Durban for offloading at the car terminal to await shipping, as space becomes available on calling RoRo vessels. A

single rail carrier of between 150 to 200 cars leaves the BMW factory every day for the Port of Durban (Hendricks, 2005). Consideration is being given to the construction of a specialised supply chain route for vehicle exports through the car terminal in the Port of East London (Ramos, 2005), but that would involve substantial improvements to the existing railway lines and rolling stock and is unlikely to come about without private investment and participation.

Development of supply chains for motor vehicle exports and imports

According to the chief automotive strategist, Gustav Meyer (2003) of the Department of Trade and Industry, the plan is to double South Africa's car exports by 2007, from 125 306 units in 2002 to 250 000 units in 2007 (Fraser, 2004b). Indeed South Africa's vehicle industry could be one of the top ten producers in the world in as little as five years' time if it raises production to one million units a year according to Ian Robertson, Managing Director, BMW South Africa (Pty) Ltd (Richardson, 2005b:10). Daimler Chrysler already plans to increase its annual output capacity from 50 000 units to 80 000 units (Richardson, 2004a:12) and to add the new Mercedes-Benz C-Class to its exports by 2007, which will require an investment of R2 billion (Cokayne, 2005:5).

In order to meet these targets, substantial more investment will be needed in the port and rail links in supply chains as well as production capacity. Transnet will need to expand the terminal capacities at the ports and to improve the rail links serving several of the manufacturers. As discussed in Chapter Seven, that may best be achieved through public-private participation schemes[11)], especially as Transnet cannot be expected to bear all the risks of the investment in capacity, when its function as common carrier does not require a specialised knowledge of the market for motor vehicles. Spoornet, which is responsible for the rail transport, will also need to improve its operational efficiency because of "low staff morale" at present (Bonorchis, 2005:18), if the targets are to be met. To some extent, South Africa's export markets in the motor vehicles trade are cushioned against cyclical fluctuations because they

are widely dispersed, but if the volumes increase, exposure to particular markets is likely also to increase.

With the globalisation of production, supply chains in the automotive manufacturing industry increasingly tend to function on a just-in-time basis in order to reduce inventory costs. That requires greater integration of the logistic task and in practice means that the long distance supply chains of Nissan and BMW will need to function seamlessly, while the short supply chains of both imports and exports of the manufacturers located near the ports will need to be integrated with greater control into the production processes.

4.4 Container supply chains[12)]

4.4.1 Introduction

Although containers are also used to carry some bulk cargo, the containerisation of break-bulk cargo is an essential feature of maritime supply chains for manufactured goods. There can be little doubt that South Africa's global trading success will increasingly depend upon the efficiency of maritime supply chains constructed to move containerised cargo. Although some 2,1 million containers move through South African ports at present (National Ports Authority of South Africa, 2004:10), none move intermodally and seamlessly in integrated chains (as defined in Chapter Two). It is thus necessary to examine existing logistics of container movements in South Africa.

4.4.2 Overview of container logistics

Technical description

Since the advent of containerisation in the early 1970s, the growth of the industry concerned with the movement of cargo in containers has been phenomenal. Much of the growth has stemmed from the main attributes of containerisation, i.e. a standardised package that can be readily identified and traced during its movement from origin to destination, irrespective of the mode of conveyance and without damage to the contents.

In order to optimise the benefits of using standardised containers in the movement of cargo at sea, new ships were developed, namely cellular containerships, to carry large numbers of containers. Some of these ships have handling gear that enable calls at any port, but most must rely on special facilities provided at terminals at all ports that aspire to participate in the trade. As efficient handling to enable the rapid turnaround time of containerships is essential to achieve the economies of scale which containerisation affords, terminal efficiency has become the criterion for inter-port competition. Ports offering such efficiency are the ports that shipowners prefer to include in their schedules.

Initially containerisation resulted in high costs for ship and cargo-owners, but the outcome has generally been savings all round in the movement of cargo through reductions in handling, documentation and transport costs. In order to achieve even greater savings, the concept of container supply chains has evolved. Such chains constitute the regular movement of containers along routes in a planned manner in order to enable users to rely on supplies to meet their input and output schedules or projected sales just-in-time.

Container terminals at ports

Although South Africa has seven commercial ports, not all of these handle containers on a regular basis. The ports of Durban, Cape Town and Port Elizabeth in that order are the major container ports with terminals equipped for handling cellular ships. Containers are also handled at East London and Richards Bay as break-bulk cargo, although most of the containers through Richards Bay are empty. Altogether these ports handled some 3 million TEUs in 2005, as shown in Table 4.2.

Table 4.2: TEUs handled in South African ports during 2005

Port	Total TEUs
Cape Town	680 895
Port Elizabeth	369 759
East London	49 338
Durban	1 889 065
Richards Bay	5 179
Total	**3 014 236**

Source: Kanjee, 2006.

Mainly containerised fresh fruit, fruit juices, fish and wines from the Western Cape are exported through the Port of Cape Town. Containerised exotic fruits, such as avocado pears, are also exported through the Port of Cape Town from the Mpumalanga area. Container imports through the port consist mainly of goods imported for Western Cape industries, while approximately 7 000 TEUs of vehicle components destined for the BMW plant at Rosslyn are imported annually from Germany and railed to Gauteng (Cornelius-Christians, 2005).

The Port of Port Elizabeth handles mainly imported container cargo for its direct hinterland, comprising largely motor component parts destined for the General Motors plant in Port Elizabeth and CKD motor cars destined for the Volkswagen plant in Uitenhage. Motor component parts are often ‘just-in-time’ cargo. Motor component parts destined for Nissan in Gauteng are offloaded in

the Port of Port Elizabeth from the Far East if the Port of Durban is too congested. Other containerised cargo includes fruit (citrus and deciduous), prepared foodstuffs, chemical products, timber, textiles and machinery (National Ports Authority of South Africa, 2004:95).

Motor car components from the UK, Europe, the Far East, the USA, Japan and South America for Daimler Chrysler are imported through the Port of East London for its plant in East London, while exports are mainly fully-assembled Mercedes C-Class cars to the UK. The Port of East London is not equipped with dedicated container handling gear, which renders the port unsuitable for the handling of other containerised traffic. In any event, the port has insufficient depth to accommodate oceangoing containerships (National Ports Authority of South Africa, 2004:77-85). Containers carried by coastal ships are handled with conventional quay cranes.

The Port of Durban is the largest container port in South Africa and serves mainly the Durban hinterland and Gauteng. Most of the containers are carried by road between Durban and Gauteng, notwithstanding the length of haul over which rail has a competitive advantage according to cost theory (Ramos, 2005). The port currently handles more than 1,4 million TEUs annually (National Ports Authority of South Africa, 2004:50). The containerised cargo through that port includes agricultural products such as grain, maize, and fruit as well as beverages and tobacco, sugar, ores and minerals, chemical products, timber, textiles, base metals and pig iron and vehicles and components.

Recent port developments in South Africa include the deep-water port in the course of construction at Coega, some 20 km north of the Port of Port Elizabeth. That port will be capable of handling all post-panamax ships (carrying between 6 000 – 10 000 TEUs) that presently cannot call at South African container ports when fully laden because of the limitations of the draught and width of entrance channels (Department of Transport, 2004:66-67). The intention of Transnet is that the port will also have a dedicated container terminal with modern handling equipment, but as yet no formal

equipment decision has been made. The possibility also exists for the Port of Coega/Ngqura to become a hub port for container services on the trade route between the Far East and South America provided that its hinterland connections are improved. However, the proliferation of container terminals in South Africa for the deep-sea trade conflicts with the recommendations contained in the Moving South Africa Strategy Report to the effect that only two terminals for trade between Europe and the Far East respectively should be developed.

Participants in container supply chains

The main participants in container supply chains, apart from the cargo-owners, are the liner companies providing ocean transport, either as shipowners or slot operators, Transnet, through the National Ports Authority responsible for port operations, South African Port Operations responsible for cargo handling at terminals and Spoornet responsible for rail transport, as well as the road hauliers and the private undertakings providing cargo services.

At present, most of the containers being distributed in South Africa are carried by road, because of Spoornet's inability to compete effectively, as well as the inflexibility of rail transport (Ramos, 2005).

Before the deregulation of road transport, rail transport enjoyed some protection from competition and Transnet was the main domestic carrier of containers. The modal split has since changed substantially in favour of road hauliers. Furthermore, the ports have been applying an *open gates* policy since 1998, which allows cargo-owners to choose the road hauliers for the transport of containers to and from ports. Such cargo was previously transported by Transnet and no other hauliers were then allowed to transport containers within a defined radius (National Ports Authority of South Africa, 2004:128; ECN Business, 1999). The major road hauliers of containers in South Africa are listed in Table 4.3.

Table 4.3: Major road hauliers of containers operating in South Africa

1. freightDynamics	11. Freight Logistics
2. IDC	12. Unitrans
3. Truckit	13. Freight Haul
4. CDS	14. Andersons TPT
5. Transzenit	15. Natro
6. Transcape	16. Tony's
7. Imperial Cargo	17. John Dory
8. Road Wing	18. Hatrans
9. Road Freight Business	19. Cars TPT
10. Bell TPTransport	20. Fast & Fresh

Source: Prepared by the author for the purpose of the study in cooperation with Van der Watt, 2005.

Spoornet is the only rail carrier and is presently engaged in a restructuring process by introducing new management skills and divesting itself of non-core businesses. Part of Spoornet's restructuring is the commercialisation of the various business divisions which, no doubt, would have to be corporatised if private participation is sought. In the light of recent announcements, however, it is unlikely that container operators will be offered the opportunity of operating container trains as private ventures in the construction of supply chains (Erwin, 2005), although confusing statements continue to emanate from Transnet[13)].

Achievement of integrated management

The role of Transnet as a state transport enterprise is unique among countries with transport systems as developed as that in South Africa. In most of those countries private participation in the development of the transport infrastructure and the operation of services for common users is well-advanced and the integrated ownership and/or management of entire supply chains exists or has become feasible. Examples are given in Chapter Five. However, the new company structure of Transnet as shown in Figure 3.1 in

Chapter Three confirms the intention of the Government to retain the ownership and management of railways, ports and pipelines through Transnet in pursuance of the policy adopted by all previous governments in South Africa since 1910. Whether the integrated management of supply chains will be achievable in some form or other is not evident, but it does seem that the need to create globally competitive container supply chains has not been deliberated in the most recent formulation of the policy of the Government towards the ownership and management of South Africa's transport system according to the policy statement by the Minister of Economic Enterprises in Parliament (Erwin, 2004) and the National Freight Logistics Strategy (2005) announced by the Minister of Transport in October 2005.

Challenges

Bottlenecks in container supply chains often occur, when, for example, the number of containers off-loaded from a ship exceeds the capacity of the onward mode of land transport (Hutson, 2005a:1). The containers must then be stacked at the port terminal, awaiting distribution as and when capacity for their movement becomes available. Although that is largely a consequence of the extent to which the capacity of a container ship exceeds the capacities of the rail and road transport to clear the containers, delays that increase the dwell-time of containers and lead to major back-ups are also attributable to the lack of handling and stacking capacity at the terminal as well as insufficient co-ordination of the intermodal flows. That, in turn, is often because management of the links at the interface is separated. Such delays are usually avoided at ports where control of the shipping, terminals and inland distribution are integrated.

In Table 4.4, the existing capacities of the major container terminals in South African ports and their throughput are summarised. The main infrastructural limitation on berth capacity at the terminals is the size of the stacking space. At present, the capacity of a container berth in South African ports is a

throughput of approximately 150 000 TEU p.a, which could be increased by upgrading to approximately 250 000 TEU p.a., as explained by MERIT (2001).

Table 4.4: Present and feasible capacities of existing container terminals and current throughput (TEUs)14)

PORT	PRESENT CAPACITY (TEUs)	FEASIBLE CAPACITY (TEUs)[1)]	CURRENT THROUGHPUT
Cape Town	430 000	1 150 000	471 112
Durban[2)]	1 200 000	2 200 000	1 223 601
Port Elizabeth[3)]	320 000	1 230 000	156 883
Total	1 950 000	4 580 000	1 851 596

Source: Merit (2001)

Notes:
1) To attain these capacities will require substantial investment and the resolution of environmental problems.
2) There is some doubt about the environmental feasibility of raising the capacity from 1,7 million to 2,2 million TEUs per year.
3) The existing two berths have limited water depth (12,2m CD) and the full utilisation of their capacity will depend upon the logistics of using the berths for cellular ships when their displacement is light and for feeder vessels with a maximum carrying capacity of between 1 600 and 2 000 TEUs. Additional berths outside the present breakwater, which would need to be extended, would enable fully laden cellular ships to be accommodated.

As for the capacity of rail transport, most lines are currently underutilised as shown by the percentages for time utilisation in Tables 4.5 and 4.6, for the routes between the inland terminal at City Deep in Gauteng, and Port Elizabeth and City Deep. These are theoretical capacities and in practice 80% utilisation is about the maximum that can be attained, which still leaves plenty of unused line capacity on all the sections shown.

Table 4.5: Rail capacity on route between Durban and Gauteng (713 km)

SECTION	MAXIMUM THEORE-TICAL TRAIN CAPACITY PER DAY	ACTUAL CAPACITY IN TRAINS PER DAY (AVERAGE)	DOUBLE / SINGLE TRACK	TRAC-TION	LINE UTILISA-TION (IN %)
Durban - Pietermaritzburg	222	• Air brake 5,3 • Container 7,6 • Passenger 2,3 • Vacuum 32,4 *Total 47,6*	Double	3 kV DC	21,44%
Pietermaritzburg – Lions River	238	• Air brake 5,3 • Container 7,6 • Passenger 2,3 • Vacuum 27,5 *Total 42,7*	Double	3 kV DC	18%
Lions River - Danskraal	238	• Air brake 5,3 • Container 7,6 • Passenger 2,3 • Vacuum 27,5 *Total 42,7*	Double	3 kV DC	18%
Danskraal - Newcastle	238	• Air brake 4,5 • Container 7,6 • Passenger 2,0 • Vacuum 23,9 *Total 38,0*	Double	3 kV DC	16%
Newcastle - Standerton	190	• Air brake 8,2 • Container 7,6 • Passenger 2,0 • Vacuum 15,9 *Total 33,7*	Double	3 kV DC	18%
Standerton - Kaydale	70	• Air brake 8,2 • Container 7,6 • Passenger 2,0 • Vacuum 15,9 *Total 33,7*	Single	3 kV DC	48%
Kaydale - Kazerne	68	• Air brake 9,4 • Container 7,6 • Passenger 2,0 • Vacuum 19,5 *Total 38,5*	Single	3 kV DC	57%

Source: Spoornet, 2002.

Notes:

- Vacuum refers to a train which is equipped with vacuum brakes. When the brake pipe of each wagon is filled through atmospheric pressure, the brake is released and when it is empty and a vacuum created, the brake is applied.
- Air brake refers to a train which is equipped with air brakes – compressed air is transmitted along the train through brake pipes.

Table 4.6: Rail capacity on route between Port Elizabeth and Gauteng (1 101 km)

SECTION	MAXIMUM THEORE-TICAL TRAIN CAPACITY PER DAY	ACTUAL CAPACITY IN TRAINS PER DAY (AVERAGE)	DOUBLE / SINGLE TRACK	TRAC-TION	LINE UTILISA-TION (IN %)
New Brighton – Alicedale	42	• Air brake 2,2 • Container 2,6 • Passenger 2,0 • Vacuum 3,5 *Total 10,3*	Single	25 kV AC	24,5%
Alicedale – Rosmead	40	• Air brake 2,1 • Container 2,6 • Passenger 2,0 • Vacuum 3,5 *Total 10,2*	Single	25 kV AC	25,5%
Rosmead – Noupoort	58	• Air brake 2,1 • Container 2,6 • Passenger 2,0 • Vacuum 3,5 *Total 10,2*	Single	25 kV AC	17,6%
Noupoort – Springfontein	52	• Air brake 0,6 • Container 2,5 • Passenger 2,6 • Vacuum 1,9 *Total 7,6*	Single	Diesel	14,6%
Springfontein – Bloemfontein	90	• Air brake 0,6 • Container 2,5 • Passenger 2,8 • Vacuum 4,5 *Total 12,4*	Single	Diesel	13,7%
Bloemfontein – Kroonstad	126	• Air brake 0,6 • Container 2,8 • Passenger 5,4 • Vacuum 6,9 *Total 15,7*	Double	3 kV DC	12,46%
Kroonstad – Vereeniging	126	• Air brake 1,0 • Container 0,9 • Passenger 5,1 • Vacuum 8,8 *Total 7,8*	Double	3 kV DC	14,13%
Vereeniging – Kazerne	262	• Air brake 1,3 • Container 6,0 • Passenger 5,5 • Vacuum 17,7 *Total 40,5*	Double	3 kV DC	15,5%

Source: Spoornet, 2002.
Note:

- Vacuum refers to a train which is equipped with vacuum brakes. When the brake pipe of each wagon is filled with atmospheric pressure, the brake is released and when it is empty and a vacuum created, the brake is applied.
- Air brake refers to a train which is equipped with air brakes – compressed air is transmitted along the train through the brake pipes.

As for road transport, which is currently the preferred mode of transport, ample capacity is available, because expansion requires investment only in equipment and its operation, while the road infrastructure is constantly being improved in response to demand at the expense of public bodies or tollroad operators. All major roads such as the N1, N2 and N3 are currently carrying high volumes of traffic, but their maximum carrying capacity is reached on short sections for only a few brief peaks during annual holiday periods.

Potential role of rail transport

The distances between the container ports and the main inland terminal in Gauteng all exceed 700 km, which, in principle, renders rail transport the preferred mode above road transport because of economies of scale (RAPID Report, 2001).

The rail line distance between Durban and Gauteng is 713 km, between Port Elizabeth and Gauteng 1 101 km and between Cape Town and Gauteng 1 531 km, with the utilisation on these railway lines all being less than 57% as illustrated in tables 4.5 and 4.6. A factor that slows down the operation of the container chains is that two or more different tractive powers are used, e.g. 3 kV DC, 25 kV AC and diesel on the Port Elizabeth – Gauteng and Cape Town – Gauteng routes, requiring trains to be halted at stations in order that locomotives and personnel, be switched. Furthermore, rail lines need to be shared with other trains, which can cause long delays when passing movements cannot be coordinated or scheduled crossings cannot be met. It is consequently difficult to increase journey speeds on the lines.

Road transport has the benefit of supplying a door-to-door service with great flexibility to suit customer needs and so provide a seamless service, which affords an inherent advantage over rail transport. Road services also operate at higher speeds, but the costs of the services and the charges are often more than those for rail transport.

According to Schuitmaker (2005:13), the following inefficiencies currently occur in the movement of containers through the ports of South Africa:

- Lack of co-ordination between terminal and rail operators
- Congestion in ports (which may result in surcharges)
- Delays in rail movement at marshalling yards and railheads
- Low productivity at terminals, especially inland terminals
- High dwell-times.

In order to achieve a seamless flow of containers from one mode to another, several requirements have to be met. Firstly, the port terminal must be designed and developed in such a way that containers can be off-loaded from the ship and immediately split into two streams, one for road and the other for rail transport. Enough stacking space must be available for stacking both import and export containers at the same time. Container-handling gear must also be well maintained in a workable condition, in order to ensure that the containers are handled quickly and efficiently. By integrating a well-designed IT system, information on the movement of the containers should be available, as needed, to all concerned. The trend worldwide is also to permit private operators to operate terminals in landlord ports (see Table 5.1).

4.5 Fresh fruit supply chain

4.5.1 Introduction

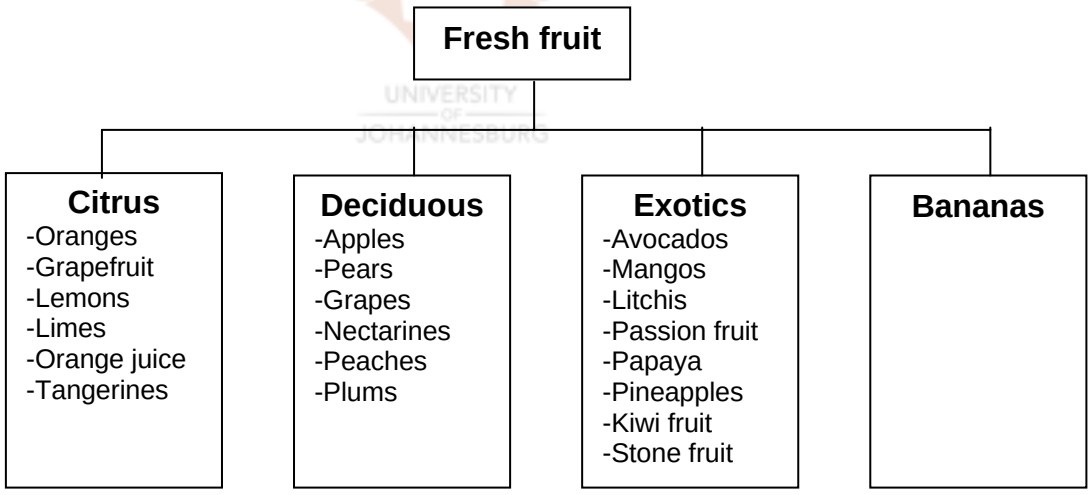
South Africa is a major exporter of fresh fruit and the economy benefits substantially from the industry. The trade in fruit exports is entirely dependent on the efficiency with which the supply chains can deliver the products to the actual points of sale overseas. Very little latitude is allowed in the care of handling and the time from picking to delivery if the quality is to be preserved

and the market to be retained. It is accordingly necessary to examine South Africa's maritime supply chains for fruit exports, especially as the banana supply chain feeding Europe from Latin America (as described in Chapter Five) conveys a huge quantity of fruit in a highly efficient manner and the ability of South African exporters to achieve efficiency in the distribution of fresh fruit overseas needs to be similar.

Description of the chain and the participants

The market for South Africa's export of fresh fruit can be divided into four produce groups, namely, bananas, citrus, deciduous and exotics as illustrated in Figure 4.8. Each group contains different varieties, requiring different fruit supply chains (Van Zandwijk & Houtman, 2002:196).

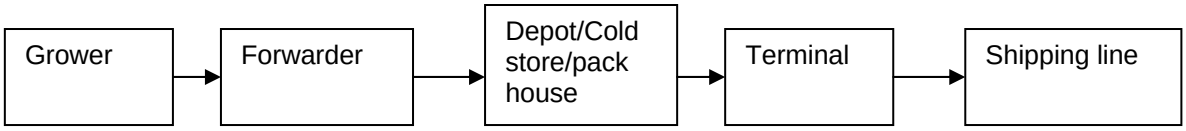
Figure 4.8: Fresh fruit commodities



Source: Drewry Shipping Consultants, 2002.

Although many different fresh fruit supply chains exist, their configuration is similar and for the purpose of this study will be generalised. The usual supply chain of fresh fruit to a port for export is illustrated in Figure 4.9.

Figure 4.9: General configuration of a fresh fruit export supply chain



Source: Prepared by the autor for the purpose of the study.

A short description of each participant's role in the fresh fruit supply chain follows. Although these participants are separate bodies, most of the control is invested in the body responsible for marketing the fruit overseas and which also operates the port terminals, serves as a forwarder and charters reefer ships for palletised cargo. Spoornet carries some fruit by rail, but most of the produce is carried by road hauliers. Liner companies are independent carriers of containerised fruit by sea.

Grower

The grower is responsible for the production of the fruit, which involves planting and harvesting. The success of the crop for export is determined by the quality of the fruit produced. The grower is also responsible for the packaging of the fruit according to the retailers' preferences, which are mostly communicated through exporters.

Forwarders

The main function of forwarders is the arrangement of the logistics service activities. That includes the transport of the cargo of fruit from the hinterland to the port and storage prior to the shiploading. The physical location of the grower will determine the mode of transport used. For example, if the growers are located in the Mpumulanga province region, mainly rail transport is used to the fruit terminal at Cape Town with. Growers located in the direct hinterland of the Port of Cape Town use road transport because of shorter transit times, which ensures the quality of the fruit.

Depot/cold store operator/pack house

Three different links in the fresh fruit supply chain with a similar core function are depot reception, cold store operation and handling of shipments. Inefficiency in this core function quickly results in bottlenecks in the chain.

Terminal

The terminal located in the port is used to collect, store and dispatch cargo and containers. The same terminal is used for both inbound and outbound cargo. The outbound function comprises receiving the fruit from the depot and transshipping it from the vehicles (road trucks or rail wagons) to the store and to the ship. The inbound terminal transships the cargo from the ship to the storage facility and to road or rail transport. Fresh Produce Terminals (Pty) Ltd is the largest portside cooling company in South Africa and operates the terminals at Cape Town, Port Elizabeth and Durban on land leased from the National Ports Authority.

Liner shipping and chartering

Liner companies are responsible for the marine links of the supply chains of containerised cargo. The choice between companies depends upon the route of the cargo and competition between liner operations. The equipment used at depots and terminals enables pallets (conventional cargo) as well as reefer containers to be carried as exporters also charter refrigerated ships for individual voyages or a series of voyages. Cargo is palletised in such ships, which compete with the liner companies carrying containers. At present (2005), approximately 62% of the fruit is exported in containers carried by the liner companies and the remainder in reefer ships chartered by the marketers of the products (Smuts, 2005:4).

Inspection

A factor that differentiates the fresh fruit supply chain from the other supply chains described is the inspection requirements. In South Africa the Perishable Product Export Control Board (PPECB) carries out inspections in order to ensure the quality of the fruit for both South Africa and the receiving countries' quality standards.

Quality is the single most important aspect of the fresh fruit supply chain and that depends largely on the efficiency of the logistics of the supply chain. Fruit needs to reach markets at the right time in order for it to be sold, which imposes stringent deadlines on all the activities of the participants in the chain from grower to retailer. The feature of the fruit supply chains of interest in this thesis is that the value of the industry lies in these chains rather that the fruit itself[15)].

Overall efficiency

An outcome of the structuring of the fruit chain for exports from South Africa is that the role of Transnet has been reduced to that of landlord for the port terminals. Some fruit is moved by rail between Mpumulanga and Cape Town, but a supply chain as such (for avocado pears) no longer operates because of the high cost and erratic service (Fuchsloch, 2004). Overall, the existing maritime fruit chains are efficient because otherwise the fruit could not be sold. According to the most recent published data, some 683 579 tonnes of deciduous fruit and 287 853 tonnes of citrus fruit were exported through the Port of Cape Town in 2002/03 and 126 400 tonnes of citrus fruit through Port Elizabeth (National Ports Authority of South Africa, 2004:100,126). In Chapter Five, the banana chain overseas is described and compared to the local chain. Worldwide the total exports of bananas accounted for 14,7 million tonnes in 2002, which is about one fifth of the total banana production (Unctad, 2004).

4.6 Conclusion and review

In this chapter, the major supply chains linking South Africa to countries overseas via international shipping have been described and some of the problems identified. It is emphasised that the cost-efficiency of these supply chains with the exception of the fruit chain depend largely on the services and divisions of Transnet, i.e. Spoornet, South African Port Operations and the National Ports Authority. Cost reductions and improvements in efficiency require not only investment in infrastructure, equipment and information systems, but in higher productivity of operations and management. Although the management of Transnet has publicly declared that substantial investment in infrastructure in order to improve service delivery will be forthcoming (Ramos, 2005), higher productivity also depends upon the extent to which its employees can be motivated to respond to the needs of the private undertakings (cargo-owners, shippers, carriers) competing in international markets. As a parastatal body, Transnet has yet to explain how that will be achieved. While public-private partnerships may facilitate new fixed investment, their long-term operational success has yet to be proved. However, the prospect of export supply chains integrated through single management, if not ownership, may have receded with the declared intention of Transnet to retain ownership and operation of the port terminals and main railway lines (Ramos, 2005).

The State's intention, thus, to retain ownership and management of the ports and railways in terms of the Legal Succession to the South African Transport Services Act, 1989 and to pursue the policy of central planning maintained by successive governments since 1910, undoubtedly constrains the scope for innovative integration of maritime supply chain links. For example, arrangements overseas whereby liner companies collect and distribute seaborne containers through their own terminals and rail services are unlikely to eventuate in South Africa in terms of the present policy (see Chapter Five). Instead, supply chains will still need to depend upon collaboration and co-ordination.

Another problem with which shipowners and managers are confronted as a consequence of separate responsibility for links in maritime supply chains, is that stemming from International Ship and Port Facility Security Code (ISPS) (see Chapter Six). The seamless functioning of intermodal supply chains requires not only efficient, but willing compliance at each interface. Petty officialdom, bureaucratic obduracy and indifference to the exigencies of the logistic task can delay traffic and disrupt schedules with serious cost consequences (Dernier, 2005). Since the ISPS became mandatory, problems attributable to the attitude of personnel and the uncertain division of responsibilities for links at interfaces have become of serious concern to maritime carriers. Most of the problems could readily be resolved through the integration of responsibilities under a single management.

There can be little doubt that the policy of the Government to retain public ownership and management of the rail and port systems as well as the difficulties in complying with ISPS when responsibility at interfaces is divided, inhibits the scope for improving the cost-efficiency of South African maritime supply chains through private initiative. Although Transnet has undertaken to improve existing supply chain performance with substantial new investment, the axiom that a state enterprise cannot invest its way out of cost-inefficiency no doubt contains truth and it remains to be seen whether productivity will be raised.

In the next chapter, several foreign supply chains are described and contrasted with South African maritime chains. Chapter Seven contains more detailed analysis of supply chain problems and solutions with reference to supply chain theory.

Endnotes:

1. Latest available update.
2. Although its replacement cost at current prices could be estimated.

3. Most of the petroleum imported into South Africa is discharged at the mooring buoy off the Bluff at Durban, while the remainder is offloaded in the Port of Saldanha.
4. Goods are purchased at cost and the importer makes his own arrangement for insurance and freight (Stopford, 1997:82).
5. Or at a mooring buoy in respect of oil cargoes.
6. The purchase price of the goods (by importers) includes payment of insurance and freight which is arranged by the exporter (Stopford, 1997:82).
7. This section has been compiled by the author by means of literature research, interviews, correspondence and a visit to the Port of Saldanha.
8. The OREX-railway is believed to be the longest iron ore railway in the world.
9. As described by Transnet in official literature.
10. These descriptions have been compiled by the author through literature research and interviews.
11. The ideology of a public-private partnership instead of the privatisation of State enterprises was explained at length by Mr A Erwin, Minister of Public Enterprises, during the Department of Public Enterprises Budget vote, vote 9, 2004/2005 at the National Assembly, 14 June 2004. (Erwin, 2004) – see section 3.3.
12. These descriptions have been compiled by the author through literature research and interviews.
13. "Transnet's strategy is to develop the infrastructure of its core businesses – ports, pipelines and rail – and by doing so improve their market value. Then we will consider partners" – Mervin Chetty, chief strategist for South African Port Operations (Enslin, 2005a).
14. Present capacity in ports has not changed since 2001.
15. "Die waarde van die bedryf lê tans opgesluit in die waardeketting en nie in die vrugte self nie" – Stuart Symington: CEO of PPECB (Gerber, 2005).