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The role of South Africa's freight rail regulatory framework in General Freight's sluggish growth performance

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Abbreviations and Acronyms

Accelerated and Shared Growth Initiative of South Africa	Asgiga
Australia	Aus
Council for Scientific and Industrial Research	CSIR
Coal export	Coalex
Department of Economic Devlopment	EDD
Department of Transport	DoT
Department of Public Enterprise	DPE
Department of Trade and Industry	DTI
European Union	EU
Growth And Economic Redistribution	GEAR
General Freight Business	GFB
Iron export	Orex
Key Performance Indicators	KPI
National Freight Logistics Strategy	NFLS
National Energy Regulator of South Africa	NERSA
Net Present Value	NPV
Public Finance Management Act	PFMA
South Africa	SA
State Owned Enterprise	SOE
Short Run Marginal Cost	SRMC
Transnet Freight Rail	TFR
United States of America	USA
Weighted Average Cost of Capital	WACC

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EXECUTIVE SUMMARY

Contextualising South Africa's freight rail business within the global freight rail setting reveals that the country is indeed a significant freight rail economy based on the relative magnitude of the annual volumes, however it has underperformed in comparison to other freight rail economies as its volume growth has declined. Over the last two decades, the country has witnessed an exodus in general freight from rail to road. The exodus was catalysed by the deregulation of transport which increased intermodal competition and saw to an increasing shift of freight from rail to road. Added to this, particularly in commodities for which rail is competitive, was the decision to significantly reduce investments in Transnet Freight Rail (TFR, the state owned freight rail company that monopolises freight rail activity) as a result of amongst other things fiscal constraints and balance sheet weaknesses. With its balance sheet strengthened, TFR has been on a major investment drive since to recapture some lost market share over the last six years. However, these investments have not had the desired impact on the country's freight volumes as these have declined at a compound average growth of 0.2 percent in the last decade.

The objectives of the study are:

- to review the performance of the current governance of freight rail with respect to pricing and investment decisions and its impact on volumes and competitiveness of general freight; and
- to describe and analyse the outcomes of the regulatory process with reference to pricing, competitiveness and investment in the context of economic and industrial policy objectives of government

There are a number of factors that are accountable for the performance of a freight rail network; namely: policy/planning and investment; economic regulation and market structure; environmental, safety and technical regulation standards and human capital to name a few. Therefore the research does not make the assumption that a well designed and implemented regulation alone is accountable to improved freight rail performance. However, as a key factor, the research project explores the contribution of the current regulatory environment in freight rails performance particularly with a focus on investment and pricing decisions.

To achieve the objectives, the research project investigated the following key questions:

- What are the common features of a regulatory regime in a freight rail economy that is performing well and what of the common features does SA's regulatory regime possess?
- How has the regulatory regime strategy aligned with economic and industrial policy objectives over time?
- What are the outcomes of the regulatory regime at the macro and micro level measured against investment, pricing and competitiveness within the context of government's economic and industrial policy?
- Evaluate the performance of the regulatory regime in meeting economic and industrial policy objectives at the macro-monitoring level and at the micro-level?

The research project took the following approach to reviewing outcomes at the macro and micro level:

- The review at the macro-level relied on desktop research particularly Transnet's annual reports, presentations and other documents and included stakeholder interviews with Transnet, the Department of Public Enterprises and the Department of Transport.
- The review at the micro-level took a multiple case study based (citrus, coalex, and automotives) approach and relied on desktop research and interviews with the respective sectors.

It was found that those freight rail economies sampled that are performing well on the basis of volume growth, volume density, train performance and staff productivity possessed common features of a regulatory regime. While the degree of regulation varies from country to country, the common features were found to be: regulatory independence; rules on pricing, investment and access; macro-level performance monitoring, micro-level dispute settlement process and investigative, enforcement and decision making legislation for the regulator.

In contrast, South Africa's regulatory regime does not possess most of these features. Rules on access, tariffs, investments are set by TFR as there is no economic regulator to set these rules and to monitor TFR's relationship with its customers. The current regulatory regime merely monitors TFR's performance at the macro-level which is conducted by TFR's shareholder, the Deparment of Public Enterprises (DPE). The shareholder compact (an annually negotiated compact which outlines TFR's key performance areas for the year) is the key instrument through which the shareholder monitors TFR's performance. The shareholder's mandate is not only to ensure the financial viability of its State Owned Enterprises' (SOE) but is also to align the operations of the SOE with government policy. Therefore the shareholder compact is guided by an overarching policy framework that governs the freight rail network and ought to be guided by Transport policy conceived by the Department of Transport (DoT) – responsible for transport policy making.

Transport policy has, since the 1996 White Paper on National Transport Policy, envisioned an intermodal competitive logistics system in which general freight has greater market share and there is greater private participation to drive competitiveness. The envisioned doctrine for greater market participation in freight rail was aligned to an overarching policy framework espoused since the 1980s that supported the deregulation of transport and corporatisation of Transnet, not only to allow market forces to drive competitiveness, but also to secure the fiscal stability of the country through private investment in rail freight and other transport infrastructure. The current overarching policy environment has since shifted towards using SOE's as catalyst for job creation through investment programmes that attempt to improve service delivery for exports and develop domestic supplier industries..

These shifts have influenced Transnet's strategic direction from one concerned with stabilising its financial position by reducing its pension fund debt and selling off its non-core assets to one that invests in its operations in order to grow volumes and efficiencies and support local industry. Since the turnaround strategy of 2005-2007 aimed at financial stability, Transnet has managed to strengthen its balance sheet to drive investments. However, investments in the freight rail business (which have even exceeded target) have failed to turn around the sluggishness in the General Freight Business (GFB) segment.[the GFB is a group of commodities that cover all commodities that are railed by TFR except for the iron export line (orex) and the coal export line (orex) cash cows]. Moreover, the coalex line has also performed poorly while the orex line is the only line that shows improvement.

The deficiencies in the underlying network are among the key factors discussed in this research project that have undermined the performance of the freight rail network particularly in the GFB segment. Given the scale of the network deficiencies, it is argued here that the regulatory regime described above's continued reliance on the balance sheet to finance investment has generated a constrained investment environment which favours private rate of returns are as opposed to social rate of returns. The reliance on balance sheet financing has continued in spite of the rhetoric from the shareholder that less reliance on the balance sheet is required to have the desired impact on the network. Private rate of returns have forced TFR to focus on sustaining investments rather than expansionary investments. Sustaining investments merely maintain rather than grow and diversify the current customer base which is already mostly focused on key bulk mineral commodities and corridors. Importantly, the private rate of returns have also forced TFR to set prices that are currently at levels higher than road which is an anomaly in the literature as rail is generally considered to be more price competitive than road. TFR's pricing policy has had a greater effect on the GFB segment, as it is generally more pricier on aggregate – although an analysis of the tariff on each commodity is likely to reveal disparities.

The micro-analysis unpacks some of the reasons for the bias in pricing against the GFB segment; particularly those commodities that are seen as critical to economic and industrial policy (agriculture and labour intensive value added goods). The reasons are firstly technical, functioning as a consequence of the constrained investment environment that has reproduced a GFB rail network with unacceptable levels of standardisation and complexity according to Transnet's own assessment. The network issues can be alleviated if Transnet requests the state for financing on behalf of economic development as it is empowered to do so by the Succession Act. However, Transnet's reluctance to go this route is unclear but may be due to a desire to secure its autonomy in decision making. This means that rail friendly commodities that have been systematically excluded from the network over a long period and thus cannot afford to pay the tariff required for the backlog in investment will remain excluded. This was found to be so in the citrus case study.

Secondly the absence of an econonic regulator to oversee tariffs and access has created a power vaccum in which established vested interests, seen as anchor investments, have become the gate keepers of the network under the watch of the shareholder. These interests have been able to assert their dominance over the network to the detrimant of other users, particularly labour intensive value added sectors.

While stakeholders in the sector agree that there is a need for regulatory reform, the pace of the reform process has been marred by policy debates about the envisioned market structure and the best policy process required to ensure that reform does not affect Transnet's balance sheet viability. This stalemate may prove disastrous for the future regulator as it will have to unravel the complex network of long term contracts that investigations may subsequently prove to be anti-competitive.The stalemate can be resolved by pleasing both sides (i.e. DoT on one side and the DPE and TFR on the other) through a fast tracked process that establishes an interim regulator and includes a financing package that can deal with the competitive biases that exist against rail yet favour road freight haulage.

1. INTRODUCTION

Over the last two decades, the country has witnessed an exodus in general freight from rail to road. Many explanations have been pitched to account for the switch: rail's technological redundancy [see Marsay (2005)](however this is countered by the rail renaissance witnessed in North America in the 1980s and 1990s); freight road's dominance as a result of the deregulation of transport [see Van der Mescht (2006)], the lack of investments in freight rail [see Perkins, Feddeker and Luiz, 2005)] and institutional or governance weaknesses [see Thompson (2009)]. Indeed the deregulation of the freight road mode increased intermodal competition and saw to an increasing shift in general freight from rail to road, however the switch, particularly in commodities for which rail is competitive, was exacerbated by the state's decision to cut investments for a thirty year period. Therefore the mass switch from rail to road at least in certain market segments is not unavoidable and the growth in rail's share can contribute to a competitive and efficient logistics system, which currently stands at 12 percent of GDP (CSIR, 2012).

Transnet Freight Rail's (TFR's) drive to recapture some lost market share through its six year capital expenditure programme demonstrates that there is scope for more general freight to be moved on rail in certain market segments. However, these investments have not had the desired impact on the country's freight volumes as these have declined at a compound average growth of 0.2 percent in the last decade. The objectives of the study are:

- To review the performance of the current governance of freight rail with respect to pricing and investment decisions and its impact on volumes and competitiveness of general freight
- Describe and analyse the outcomes of the regulatory process with reference to pricing, competitiveness and investment in the context of the economic and industrial policy objectives of government

This will be done by analysing the influence of the regulatory regime and overarching policy framework on TFR's investment strategy (section 4); followed by a critical evaluation of the outcomes at the macro-level (section 5) and then at the sectoral level through case study analysis of sectors identified as important to economic and industrial policy (section 6). The paper will show that the sluggishness in GFB's volume growth is due in part to the fact that the current macro-level performance based regulatory framework has encouraged a constrained investment environment that biases private rates of return rather than social rates of return inherent in TFR's key commodity key corridor strategy. The paper will argue that South Africa is characterised by a macro level performance based regulatory regime. The implication of such a regime is that it does not address disputes at the micro or sectoral level. Given that the freight rail system operates within a constrained investment environment, the absence of a regulator has created a power vaccum that may have been exploited by cretain vested interests that have always benefited from freight provision and may continue to do so unduly at the expense of other general freight users. Therefore the paper argues in support of the establishment of an economic regulator, however also argues that accompanying the establishment of a regulator is financing package that ensures the viability of rail in relation to road. The paper will highlight the unresolved policy contests that are impeding the regulatory reform process (section 7).

First, we turn to reviewing the literature on pricing and investment decisions in a vertically integrated monopoly railway to understand the motives of railways companies such as TFR in their pricing and investment decision (section 2); which is followed by an assessment of SA's freight rail performance relative to other freight rail economies (section 3).

1.1 Methodological Approach

In order to achieve its objectives, the research project investigated the following key questions:

- What are the common features of a regulatory regime in a freight rail economy that is performing well and what of the common features does SA's regulatory regime possess?
- How has the regulatory regime strategy aligned with economic and industrial policy objectives over time?
- What are the outcomes of the regulatory regime at the macro and micro level measured against investment, pricing and competitiveness within the context of government's economic and industrial policy?
- Evaluate the performance of the regulatory regime in meeting economic and industrial policy objectives at the macro-monitoring level and at the micro-level?

The research project took the following approach to reviewing outcomes at the macro and micro level:

- The review at the macro-level relied on desktop research particularly TFR's annual reports, presentations and other documents and included stakeholder interviews with Transnet, the Department of Public Enterprises and the Department of Transport.
- The review at the micro-level took a multiple case study based (citrus, coalex, and automotives) approach and relied on desktop research and interviews with the respective sectors.
- The paucity of data was a major constraint to reviewing outcomes at the macro and micro level. The data requirements for the study included: time series of tariffs charged by TFR on citrus, coalex, automotives and manganese, time series of tonne km railed and revenue for each of the case study sectors, and interviews with the key account managers that manage each of the case study sectors. TFR keeps track of this data, however our requests for access to this information came to no avail because of the fear that public dissemination of the information may place certain contractual agreements at risk.
- Interviews held with TFR are reflections of the performance of freight rail as a whole at the macro level as we could not obtain interviews with TFR's sector desks in charge of the case study sectors to have a sense of their understanding of the performance of the system at the micro level. This presents a potential bias for the analysis at the micro level because much of what is reflected are the sectors' views.

2. PRICING AND INVESTMENT DECISIONS BY AN UNREGULATED VERTICALLY INTEGRATED RAILWAY

A railway network is principally a natural monopoly and therefore has the tendency to display the hallmark characteristics of a monopoly such charging high prices above the level valued by the customer. This has the effect of generating lower output and lower investments. Therefore access price and investments are key to regulatory decisions to ensure that prices set by the monopoly are competitive and investment responds to demand. This section reviews the literature that characterises pricing and investment decisions of an unregulated vertically integrated railway operation such as TFR.

2.1 Economic Characteristics of Vertically Integrated Railways

A railway is principally considered to be a natural monopoly as it exhibits economies of density. The infrastructure has a large fixed cost component and also has a variable cost component. The World Bank points out that a railway's fixed cost component differs by volume of traffic at a minimum rate of 70 percent of fixed cost. Therefore a railway's average cost component decreases as volumes increase in the long run. This implies that a railway requires large volumes of transit running over a frequently utilized track for it to operate efficiently.

Campos and Cantos (1999) point out a number of rail characteristics that add to the complexities involved in setting prices and in making investment decisions. The notable characteristics outlined are the multi product nature of railway service activity, asset indivisibilities and externalities.

Multi product: Freight rail serves a variety of customers; these may include bulk freight, cargo wagons or containerized freight and postal services. The implication of the multi product nature of railway services is that it is a challenge to allocate costs amongst different customers.

Asset indivisibility: railways are a highly capital intensive sector with large sunk costs. Therefore investments in capital units increase in incremental or discrete units whereas demand can fluctuate in even smaller units. Therefore capital expansion can result in over capacity, as increases in the supply of capital may be greater than the increase in demand for rail services. This is referred to as the lumpiness of rail investment, which has implications on investment and pricing decisions. For instance, where capital investments have led to excess capacity, the cost of transporting increased volumes of traffic will have limited impact on price; however the impact on price will be significant when there is full capacity utilization. The high costs of capital replacement may force railways to use assets with differing life spans, which generates heterogeneity in costs. This requires dynamic pricing decisions in order to accommodate replacing assets characterized by variances in asset life. The lumpiness associated with discrete infrastructure upgrading implies that railways seldom change their entire fleet and network; rather they opt for partial renovations,which introduce "technical asymmetries between tracks within a country".

Externalities: A railway's contribution to negative externalities such as congestion, pollution etc is far less than that contributed by road. However these externalities are not fully internalized by road, which makes a large price wedge between rail and road. Therefore rail's prices should be significantly lower in order to create a balanced intermodal transport system.

2.2 Price Setting Practices within a Vertically Integrated Railway

The economic features of railways discussed above have an influence on pricing and investment decisions. The discussion will outline the various price-setting options that are available to railway operations. The discussion draws from Peter's (2003) analysis of the common rail pricing strategies found in the transport economics literature; namely: Short Run Marginal Costs, Ramsey Pricing and Non-linear or Multi tier pricing.

Peter (2003) ranks the pricing strategies according to their ability to satisfy two objectives; namely: static allocative efficiency and dynamic allocative efficiency. Static allocative efficiency refers to that price level that maximizes social welfare and is set at the marginal cost. At this price level, demand meets the required quantity and quality of slots supplied. Dynamic allocative efficiency refers to the price level that acts as a signal for investments/upgrades and disinvestments and accounts for variable costs and blockwise variable costs which are linked to particular customer segments. Therefore a dynamic price system accounts for the volume of transit, the infrastructure characteristics and the superstructure of the infrastructure.

Short run marginal costs: marginal cost is defined as the extra cost incurred from an additional train run. Marginal costs are those costs that vary according to the amount of time, region and quantity of customers as a result of use. Therefore costs that do not vary as a consequence of use are not included in the calculation. The price setting is often referred to as the first best scenario as the price is set at the marginal cost level and therefore fulfills the static allocative efficiency objective.

However SRMC has been criticized on various grounds. The first is that SRMC is a short cut to a railway's bankruptcy it does not allow for the railway to fully recover its costs. Peter (2003) argues that marginal costs are in theory applicable if the following assumptions are fulfilled:

a. Transport technology relies on a combination of inputs rather than individual inputs to allow for marginal costs to increase to the equilibrium price for full cost recovery i.e. technology is convex.

b. Transport investments are perfectly divisible or investments increase as demand increase. This would simplify network extension activities

c. Perfect markets in other modes of transportation would allow for a pricing or investment mechanism that sets prices at the marginal cost level for the whole market system

However these assumptions are unrealistic given the discussion on the economic features of a natural monopoly in subsection 3.2. A railway's cost structure is such that marginal costs are below marginal revenue. Therefore since marginal cost does not intersect marginal revenue cost recovery is not possible where prices are set at marginal cost. Moreover investments are indivisible or lumpy due to the high fixed cost of capital characteristic therefore investments do not automatically increase in response to increases in demand. The application of the marginal cost pricing and investment rule would lead to price and investment fluctuations, which will make it difficult for business decisions to take place. Therefore the SRMC does not fulfill the dynamic allocative efficiency objective, as prices are set too low to incentivise investments/upgrades or cost saving and revenue generating technologies.

Ramsey price system: can be seen as an extension of SRMC that takes into account the deficit coverage constraint and factors in the multiproduct nature of railway services. A discriminatory price mechanism for slots according to region, time and customer is applied to ensure that the railway maximizes its revenue so that it can cover its operational costs. This requires the railway to know the customer's price elasticity of demand i.e. its sensitivity to price changes. The price mechanism applies an inverse elasticity rule such that the proportion of markup on marginal cost is equal to an increase in the elasticity of demand. This simply means that when

demand is high and customers are not sensitive to price changes (i.e. price elasticity is low) then a high price is set to maximise revenue. In instances where demand is low and customers are very sensitive to price changes then a low price is set.

The Ramsey price model has been criticised, as the basic model does not consider the intermodal competition that could provoke a shift from rail to another mode if prices are set too high. To accommodate this error, an extension of the model considers the intermodal competition by including cross-price elasticity between substitutable modes. However an even stronger criticism launched against the model is that the information required to calculate demand and cost functions is often times difficult to obtain. This makes the model theoretically appealing but impractical. A general rule of thumb that is used is that slots are charged at a rate that the market can bear. This implies that they must be high enough so that the railway can maximise its revenue for cost recovery and low enough so that customers do not switch to alternative modes of transportation. These prices are second best as they deviate from the social welfare-pricing scenario, however they achieve dynamic allocative efficiency as they accommodate rail cost recovery.

Non-linear price system: allows for price differences in accordance to volume of different slots. Slots are charged at the marginal cost level and the deficit is covered with a fixed fee. This implies a two-tier system that comprises a fixed fee and a variable component. The two-tier system applies a fixed fee that is charged across all the customers.

The two-tier system encounters challenge when it sets a fixed fee across customers with varying demand functions as this may influence demand or intermodal switching. Peter (2003) and Rotherngatter (2003) argue that a self-selecting tariff system is perhaps the best price setting mechanisms as customer demand patterns are seldom known by the railway in order to set an appropriate price. The self-selecting tariff system involves the railway setting a range of prices differentiated by region, customer or time and then the consumer determines the suitable price for its operations that matches the specification of his/her cargo. Therefore the onus is on the customer to determine the businesses cost structure in order to identify the appropriate price as an incorrect tariff may lead to losses.

2.3 Decisions under Indivisible or lumpy Investments

The previous discussion showed that price setting mechanisms must be designed such that they are able to balance social welfare maximization requirement and provide an incentive for cost recovery and investments. The literature on an infrastructure investment decision, projects the decision to delay investment as a rational decision on account of the risks induced by the characteristics infrastructure; namely: its irreversibility and its indivisibility.

Turvey (2000) argues that due to the indivisibility of infrastructure, investments in capacity usually take place on the back of large demand pressures that are reflected in high levels of congestion. At this time, there is a strong justification for high access prices, which will drastically fall once demand pressures are met through increased investments. Congestion results in delays and poor service delivery. Customers that are able to bear this cost and have experience with the railway can accommodate the time delays in their client schedules. However others may simply switch to other modes of transportation. Railways may try to retain their customer base by compensating those suffering from delays.

Guthrie (2006) also argues that railways may delay investments once pressures are significant enough to justify the investments. He however points to other risks that stem from the irreversibility and indivisibility of investments that make the decision to invest even with high demand pressures a challenge. The other risks Guthrie (2006) refers to are: the long lead time risk in which demand changes for the worse resulting in under utilization of capacity and the changes in input pricing that may result in high cost overruns.

The literature suggests project finance formulae that planners can use to ascertain whether or not it is feasible to invest; namely the cost benefit analysis, internal rate of return and the net present value. Investment is justified where the benefits, whether stemming from the future cash generated from investment (NPV) or the high return on revenue generated from investment (IRR) must outweigh the costs of investing. These costs can be the expenditure of the investment itself and the cost of destroying the delay option associated with periods of high demand.

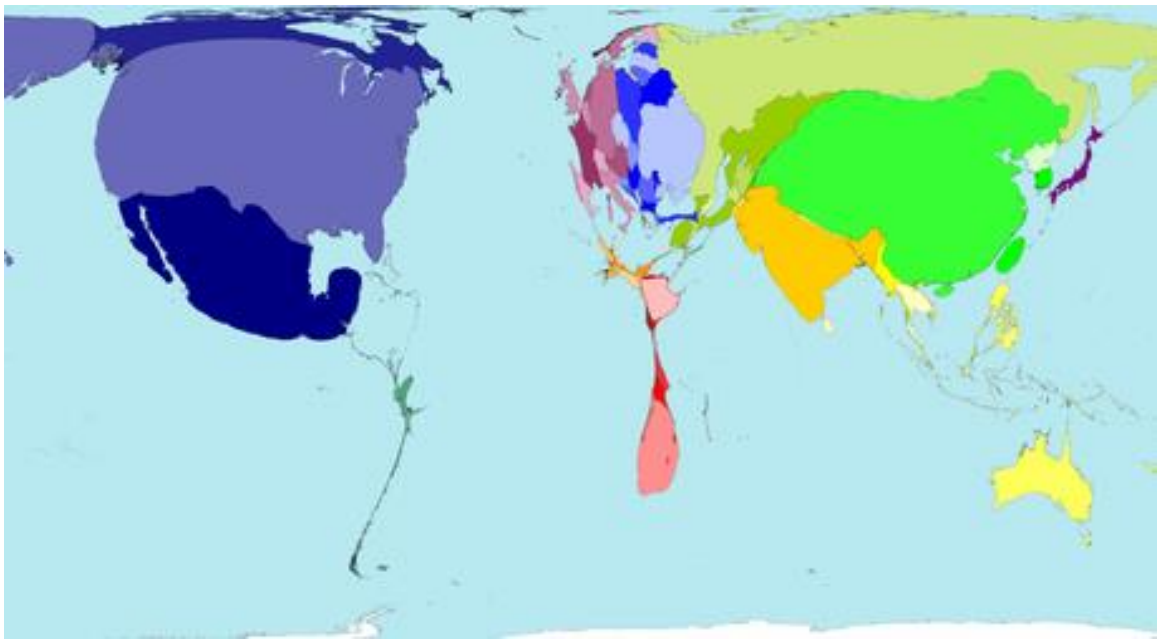
However, as argued by Guthrie (2006) an unregulated monopolist may decide not to invest even when the benefits of investing outweigh the costs as expressed by the positive NPV. The probability that an unregulated monopolist will decide not to invest is high given that it has the option to maximise revenue by setting its prices above the marginal cost thus restricting output and investment. Guthrie therefore argues that the role of the regulator must be to ensure that the monopolist invests once the benefits outweigh the costs as described by the NPV.

3. GLOBAL PERSPECTIVE: RELATIVE PERFORMANCE

Contextualising South Africa's freight rail performance within a global setting is made difficult by the fact that each country is characterized by unique structural features that determine performance. Some of these unique structural features include the country's regulatory regime, the underlying network technology, distances and climate. Notwithstanding this important caveat, the section will compare South Africa's freight rail performance with that of other leading freight rail economies; namely the US, Canada, Russia, China, India and Australia. It will then describe the common features of a regulated freight rail network to determine South Africa's place in the regulatory continuum.

South Africa has the largest freight rail market in the continent and can be classified as a freight rail economy given the relative size of its freight rail business (figure 1). The country's freight densities (measured by freight tonne/km), staff productivity and train performance are competitive considering the size of the country's freight rail market (table 1). However, the country's freight rail system has underperformed in other areas. Annual tonnage performance has declined by 0.2 percent while comparator countries have experienced growth (table 1). Growth in China, Russia and Australia is linked to the 2000s commodities super cycle, North America's (Canada and US) stagnant growth was preceded by a period of rapid growth between 1980s-1990s after regulatory reform, while the EU's small freight rail market has been growing thanks to Germany's strong performance.

Figure 1. Country Comparison of Size of Freight Business



Source: Worldmapper.org

Thompson (2009) argues that South Africa's freight densities are a reflection of two of the country's most efficient lines rather than a reflection of the operational efficiencies of the country's entire freight rail system. The coalex and orex lines operate along "6.7 percent of the entire [22,300] line km track, but generates 56 percent of tonnage and 60 percent of the tonne km" (Thompson, 2009:9) .

Table 1. Country Comparison of Freight Rail Performance

	Train Performance		Volume Performance				Gauge		
Country	a. Train km (millions) 2011	b.Tonne/km (millions) 2011	c.Mt 2011	d.10 yr CARG % 2001-2011	e.Freight tonne/km 2011	CARG freight tonne/km	f.Cape Gauge 1000-1067mm	g.Standard Gauge 1435-1520mm	h.Staff Productivity 2011
US	794	4,495,196	1,710	0.7	2,254,585	0.5		218,554	15,935
China	1,824	4,198,054	3,184	12.1	2,562,635	6.7		72,404	1,255
Russia	1,473	4,043,783	1381	3.1	2,127,832	6.1		86,660	2,320
India	1,022	1,445,869	922	6.9	625,723	8.0	14,024		471
Canada	155	646,824	310	0.3	254,069	-2.3		66,828	7,933
SA	60	170,083	182.1	- 0.2	113,342	0.7	22,300		4722
EU	4,260	1,226,818	1283	3.6	326,429	3.5			297
Germany	978	392,883	412	4.1	111,980	4.6		45,991	397
Australia	29	101,956	242	5.2	59,649	5.0	18,988	16,042	6,627

Source: Constructed using UIC.org data. a. the number of kilometers completed by train; b. the number of tonnes of freight moved by train per kilometer, c. the number of tonnes moved per kilometer on average, c. Metric Tonnes, e. the size of the route length for a Cape Gauge track, f. the size of the route length for a Standard Gauge track, g. the number of tonnes/km moved per staff.

The SA freight rail system's underperformance based on the negative Compound Average Rate of Growth (CARG) in volumes and stagnant pace in volume densities over the last decade, is linked to investment cuts over the last three decades and the growth in the use of road transportation after the deregulation of the country's freight road mode (see section 4). The cuts in investment was particularly devastating to the country's freight rail business given the deficiencies in the country's underlying network technology as discussed in section 5. Investments into North America freight rail system have introduced a standardized and a simple network that have boosted performance (see Railkonsult, 2012) (see section 6 for discussion on disparities on South Africa's network).

The underperformance has also been linked to weaknesses in the regulatory regime (see Thompson, 2009). The freight rail network is owned and operated by a single corporatized unregulated state monopoly, Transnet Freight Rail (TFR). TFR's corporatization was part of a global network infrastructure privatisation agenda emerging in the 1980s. The anticipated outcomes of that agenda (i.e. high output, better services, competitive pricing) were not realised and in the 1990s a new set of reforms emerged globally which focused on regulating the conduct of both state and privatised network infrastructure. Although there has been a push for economic regulation for the country's freight rail system, this has not been achieved.

Illustrated in table 2 are the common features of a regulated freight rail network and the features that the selected countries possess. South Africa's regulatory regime can be characterised as performance based as the rules merely monitor key performance areas as set out by TFR's shareholder and TFR (see section 3). The other countries operate on a more formalized rules based regulatory system with legislated economic regulators that possess investigative and enforcement powers operating within a dispute settlement process. The

nature of the rules based system varies considerably across countries. On the one extreme is the US's minimal regulatory regime whilst on the other is Australia's highly regulated regime.

The current US regulatory environment was set up in response to the 1970s railroad bankruptcies during a period of heavy regulation (see Cramer, 2007). The reform process stripped down regulations over prices, labour, mergers and acquisition towards a model that fosters commercial decision-making through commercial contracts (Drew, np: 35). However the regime has a dispute settlement process wherein disputes over pricing, service and access are heard and settled by the regulator (see Cramer, 2007). The burden of proof lies with the complainant and a maximum price is instituted if the railroad is found guilty of excessive pricing (Drew, np: 35). The system is characterised by minimal regulation out of a thinking that there is a significant amount of rivalry induced by a relatively mature competitive market structure (see Drew, np:35). Therefore the rules are mostly focused on regulating mergers and acquisition to ensure that rivalry is maintained (Drew, np:35). The Canadian regulatory system also encourages commercial decision-making, however it perhaps has more rules on access and service provision since the market structure is duopolistic (see Padova, 2007). Australia has different regulatory regimes across the states and is more regulated than the US and Canadian system with regards to price, access and investment rules (see Queensland Government, 2010). Generally, commercial decisions are supported within the bounds of regulation. For instance, the regulator of Western Australia sets a price band within which contracts are negotiated; in Queensland, the seeker applies to the owner for access, the owner provides an indicative capacity assessment within 30 days and parties subsequently negotiate and seek agreement. If there is no capacity then the owner is required to provide a cost-estimate for expanding the network which will be met by the seeker, however the seeker will pay for the expansion through the tariff (see Queensland Government, 2010) .

Table 2. Country Comparison of Regulatory Regime

	Level of regulation	Ownership Structure	Regulatory independence	Rules: pricing, investment, access	Macro performance Monitoring: KPIs	Micro performance monitoring: Dispute Settlement	Investigative, enforcement and decision making legislation
Canada	Medium	Privatised Vertically integrated Duopoly	✓	✓	✗	✓	✓
US	Minimal	Private vertically integrated 4 main companies	✓	✓	✗	✓	✓
Aus	High	Private and public vertical separation	✓	✓	✓	✓	✓
SA	N/A	Corporatised Vertically Integrated Monopoly	✗	✗	✓	✗	✗

Source: Authors Construction

In summary, South Africa can be classified as a freight rail economy on account of the relative size of its freight volumes moved. However, the country's freight rail system has underperformed compared to comparator countries given the decline in volume growth. South Africa's freight rail system was also shown to be the least regulated amongst the selected comparator countries as it lacks key features of a regualted rail network: dispute settlement process,;rules on pricing, investment and access and an independent regulator with investigative, enforcement and decision making legislated powers.

4. SOUTH AFRICAN PERSPECTIVE: REGULATORY REGIME, POLICY AND TRANSNET STRATEGY

The previous section argued that one of the characteristic features of South Africa's regulatory regime is that it is only empowered to fulfill a performance-monitoring role at the macro-level. This section aims to provide further details about the actors and mechanics involved in SA's regulatory regime and how the regulatory regime influences Transnet's Corporate Strategy and vice versa.

4.1 Fleshing Out South Africa's Regulatory Regime

In the main, there are three important actors that form part of SA's freight rail regulatory regime; namely: the Department of Transport (DoT), Department of Public Enterprises (DPE) and the Safety regulator. The Railway Safety Regulator is empowered by the National Railway Safety Regulator Act of 2002 to oversee the safety and functioning of the country's railway network by providing safety standards and "regulatory practices for the protection of persons, property and the environment" (DoT, 2012). The DoT is responsible for developing transport policy and exercises oversight on several rail related Acts (DoT, 2012). The most notable acts are: the various Acts in the 1970s that ordered the construction of dedicated railway lines and port for the export of iron ore and coal; the Legal Succession Act of 1989 that corporatized what is today called Transnet; the Transport Deregulation Act of 1988 which deregulated road freight transportation and the National Railway Safety Regulator Act of 2002 which established the safety regulator.

The DPE is TFR's shareholder. This role is empowered by the Public Finance Management Act (PFMA). As shareholder, DPE's mandate is to ensure the financial viability of its SOEs and to align their operations with government policy (DPE, 2011). Therefore the Act narrowly defines DPE's regulatory responsibility within the arena of performance monitoring.

This performance based governance regime is meted out through various provisions in the Act that oblige SOEs to engage in agreements with the shareholder and to make certain submissions to the shareholder for approval that effectively act as performance monitoring instruments (Presidency, 2012). More specifically, the SOE is obliged to submit corporate plans, revenue projections, expenditure and borrowing plans to the shareholder for approval. Treasury Regulation 29.1 specifies the types of corporate plan's that the SOE must submit to the shareholder; and importantly, the PFMA obligates the shareholder and its SOEs to enter into annually negotiated shareholder compact (Presidency, 2012). The shareholder compact is an agreement that regulates the relationship between the SOE and its shareholder, sets out the key performance areas to which the SOE must comply and the reporting procedures for performance monitoring (Presidency, 2012).

Stakeholder interviews with DPE and TFR representatives corroborate that the shareholder compact is the most important control mechanism that regulates TFRs actions. The regulatory regime is rewards and punishment based. It rewards 'good performance' (i.e. meeting and exceeding KPIs in shareholder compact) by distributing staff bonuses and may punish bad behaviour by changing the SOE's board of directors. However, stakeholder interviews clearly demonstrate that the shareholder compact is used to effect DPE's formalized shareholder responsibilities rather than its de facto quasi-regulator assumed responsibilities. This is due to the fact that the compact is a negotiated process, therefore TFR has the room to maneuver such that it negotiates terms that it can commit to. Secondly, punishments for poor performance do not go far as there is an appreciation of TFRs task; and as one respondent remarked, it is not in the shareholder's interest to "whip the business". Corrective actions are

also made difficult by the fact that the shareholder has an indirect and disconnected relationship with TFR (through holding company Transnet). Consequently, there is no formal dispute settlement process in which the quasi-regulator can arbitrate disputes between TFR and its customers. In contrast, the Eskom SOE is subjected to the same shareholder governance system by the DPE, but its relationship with customers is simultaneously subjected to the regulatory authority of the National Energy Regulator of South Africa (NERSA). Moreover, other of Transnet's network sectors such as the ports, pipelines and other SOEs such as Telkom and the Airports Company of South Africa are subject to regulation.

4.2 The Overarching Policy Framework's influence of the Freight Rail Governance Regime

The regulatory regime's performance monitoring is not only guided by the formal rules that govern its relationship with TFR; but is also guided by an overarching policy framework that governs the freight rail network. The section will outline how the policy framework has evolved since the 1980s and how it has been interpreted by the DoT and DPE in their formulation of policies and strategies for the country's freight rail network.

The evolution of the overarching policy framework for the country's freight rail network in the last three decades is distinguished by two policy phases. The first policy phase, beginning in the 1980s and lasting until the early 2000s, spearheaded the privatisation and deregulation agenda (Table 3). It was believed that deregulation and privatisation of infrastructure provision would create a competitive infrastructure network while at the same time ensure economic growth and stability through restoring fiscal balance (Table 3).

In the 1980s, the deregulation and privatisation agenda began with the De Villiers commission report in 1986. The report recommended that Transnet (South African Transport Services) should pay taxes and pursue profits and that the state should deregulate freight transport and privatise its state owned enterprises in earnest (see Stander and Pienaar (2002). Interviews with DPE and TFR revealed that it was the De Villiers commission report that ended state capital injections in the rail network. The findings of the report were subsequently reflected in the Legal Succession Act of 1989 which ordered the corporatisation of Transnet thus setting in motion an era of balance sheet financing of expenditure. The Growth, Employment and Redistribution (GEAR) policy of 1996 continued to deepen the privatisation agenda. Privatisation was one of many policy instruments adopted to reduce what was seen as an unsustainable fiscal deficit that would impair the country's macroeconomic stability.

With macroeconomic policy setting the type of market structure for Transnet's and other SOEs, the microeconomic policy, as set out in the Department of Trade and Industry's (DTI's) Microeconomic Reform Strategy, made pronouncements on the country's transport/logistic system in general [see Dobson (2002)]. Its stake in the sector was from the perspective of ensuring competitive transport prices and quality services as a means of driving competitiveness in industrial activity for the domestic and most importantly the export markets (see Dobson (2002). The document did not specify actions that ought to be taken.

The privatisation agenda influenced how DoT (in its transport policy) and DPE (in its shareholding responsibility) characterized Transnet's strategic value. Three central themes run across the spectrum of policies produced by the D.O.T on South Africa's land freight transportation system. The first is the need to create an efficient, reliable, equitable and importantly integrated or seamless intermodal transport network that is responsive to customer demand and supports economic development. The second is the need to restore freight rail's market share in total land freight transportation, therefore shifting general freight

from road to rail in rail friendly commodity segments. The last is creating a commercially viable land freight transport system that has a financial return supported by user charges and minimal subsidies. These themes were first highlighted in the White Paper on Transport published in 1996 and carried through into the Moving into South Africa Project (1998), the National Freight Logistics Strategy (2005) and the National Land Transport Strategic Framework (2005).

Table 3. Interaction between Overarching Economic Policy and Regulatory Regime

	Macroeconomic Policy	**Microeconomic Policy**	**DoT**	**DPE**
Phase 1: 1980s early 2000s	Deregulation and Privatisation of SOEs Policy: Gear (1996)	Competitive logistics for exports	Aim: seamless & competitive intermodal transport system, boost general freight Investments, End-state competitive market, Interim economic regulator Policies White Paper on National Transport (1996) Moving South Africa (1998) National Freight Logistics Strategic Framework (2005)	Aim: Privatise to max shareholder value & operational efficencies Policy: Policy Framework for an accelerated agenda for the restructuring of State-owned enterprises
Phase 2: mid 2000s until present	Capital Expenditure for jobs and economic growth Policy Asgisa (2006)	Competitive logistics for value added goods, SOE buying power for BEE and industrial development Policy: NIPF (2007)		Max SOE developmental impact through procurement & investment Less balance sheet financing to boost investment, especially GFB intermodality Policy: Strategic Plan 2012-2017

Source: Authors construction

The National Freight Logistics Strategy (NFLS), which is currently under implementation, is perhaps the most explicit in articulating a vision for freight rail; is the most critical of the institutional commitment towards an intermodal system in which rail has a greater share in land transport movements and is the most explicit in setting out a turn-around strategy for freight rail. The NFLS characterizes the problem in the following statement:

"The freight system in South Africa is fraught with inefficiencies at system and firm levels. There are infrastructure shortfalls and mismatches; the institutional structure of the freight sector is inappropriate, and there is a lack of integrated planning. Information gaps and asymmetries abound; the skills base is deficient, and the regulatory frameworks are incapable of resolving problems in the industry." (D.O.T, 2005).

The strategy also points out that it is in general freight that freight rail has lost significant market share due to overpricing, poor services and underinvestment in rail infrastructure and operations amongst many factors. Moreover, the strategy argues that whilst other countries have experienced the most growth in containerized freight, South Africa's freight rail system has failed to follow the international trend. The NFLS points out that the infrastructure short falls and mismatches in the freight rail segment stem from a lack of investment in the segment, which is enabled by an institutional framework that secures Transnet's dominance in key regulatory activities - in price setting and infrastructure decisions. The strategy makes the

following recommendations related to the governance of the rail network aimed at serving microeconomic policy objectives of the development of a competitive logistics system for exports:

- A funding mix that separates the dual SOE commercial and non-commercial or developmental mandate in order to remove the current perversion of underfunding infrastructure projects brought about by cross subsidizing loss making operations. SOE's must continue to use their balance sheets to finance commercial projects however in a manner that subjects them to financial market discipline through the removal of government guarantees; while sovereign funding must be allocated to non-commercial activities such as branch line revitalization and rail infrastructure extension.
- A transitional process managed by the DoT which introduces a regulated pricing system and a competitive market structure which allows for private operators to provide rail services first on the secondary network and then primary network. The assumption is that a competitive market structure will increase output, improve service quality and pricing.
- Economic regulator to regulate economic efficiency, price setting and market access; and a safety and security regulator.

DPE introduced the SOE Restructuring Framework in 1999 with a strategic aim of maximizing shareholder value by attracting private investment where possible and ensuring that SOE operations emulate competitive private firm operations (DPE, 1999). The first port of call was to restructure Transnet's Pension Fund debt to restore profitability in the business. Second was to restore profitability of the General Freight Business that had been benefiting from cross subsidies from the profitable Coalex and orex lines (DPE, 1999). The eventual removal of cross subsidies was viewed as critical as subsidies placed the long-term viability of the coalex and orex operations in jeopardy (DPE, 1999). This would be done through corporatization and the introduction of private capital into the GFB and the concessioning of the export ore lines (DPE, 1999).

The restructuring framework cited a number of critical challenges facing Transnet in general and the rail network in particular that undermined the sustainable functioning of the country's transport system:

a. Transnet's pension fund debt was seen as the biggest obstacle to the company's profitability
b. Secondary to this was Spoornet's (now Transnet Freight Rail) General Freight Business loss making business. The GFB relied on subsidies from profits made in the coallink, orex and other Transnet divisions in order to keep afloat

While the restructuring framework was confident in government's turnaround strategy for Transnet's pension fund debt, it was concerned with the entrenched pattern of cross subsidization of loss making operations. Transnet's corporatization meant that it had to rely on its own balance sheet to finance its projects and operations. The framework argued that cross subsidization resulted in a lack of capital and operational investment in value maximizing profitable operations, which in turn threatened their long term viability and thus the viability of the transport system as a whole. The turnaround strategy proposed by the framework outlined that the "restructuring of Spoornet focuses on maximising value for the existing shareholder" (DPE, 1999: 139).

The framework proposed that each of Spoornet's divisions were to be corporatized in line with value maximisation. The specific actions by which corporatization was to be implemented were the following:

a. GFB and Rail and Terminal Services would be corporatised into one entity; and in the medium term, a strategic equity partner would be brought into the ownership structure or even the "option of releasing further value in a future [Initial Public Offering]" was to be explored.

b. Linkrail, which managed the loss making branch lines which are mostly located in rural areas would be concessioned

c. In the long run, the coalex, orex and luxrail would be concessioned.

The proposed hollowing out of state enterprises was critically linked to how they had become objectified by the state. As mentioned, the restructuring framework outlines that the central focus for restructuring Spoornet was value maximization. The principle of value maximization that guided Spoornet's restructuring programme therefore treated the entity as a tradable asset class in which value (meaning profit) can be unlocked. This was assumed not impinge on Transnet's developmental mandate. In fact, the value maximization principle that guided the proposed restructuring would fulfill one of the framework's key intentions outlined in the following passages as a means of limiting the fiscal burden:

"Government should maximise the optimal return on the shareholder (fiscus) whether through the proceeds from equity sales, dividends and/or tax returns. By adopting this optimal approach government can maximise its long-term returns on its shareholding by trading off short-term gains in depreciated assets for medium and long-term gains (dividends, taxes, deferred equity sales) from successfully restructuring SOEs." (DPE, 1999)

During the mid 2000s, the policy environment entered into a new phase in which the envisioned strategic value of SOEs captured in certain policies began to shift towards a more developmental role similar to that played by SOEs in East Asia. East Asian SOEs had a broader mandate that included capital expenditure programmes that were used for job creation and leveraged to build a domestic industrial base. The shift towards leveraging the capex programme for job creation and the development of domestic industrial capabilities was captured in various policy documents: the Presidency's Accelerated Shared Growth Initiative for South Africa (2006), the DTIs National Industrial Policy Framework (2007) and its iterative Industrial Policy Action Plans, the DPE's Competitiveness Supplier Development Programme and its 5 year Strategic Framework (2012-2016), the Department of Economic Development's (2010) New Growth Path and the African National Congress's Economic Transformation document on Development Finance Institutions and SOEs (2012). A second policy thrust emphasized the development of a competitive transport network that served value-added goods. Creating greater linkages between the transport network and value added goods was given emphasis in the DTI's NIPF and the iterative IPAPs, the DPEs strategic framework and the EDD's NGP.

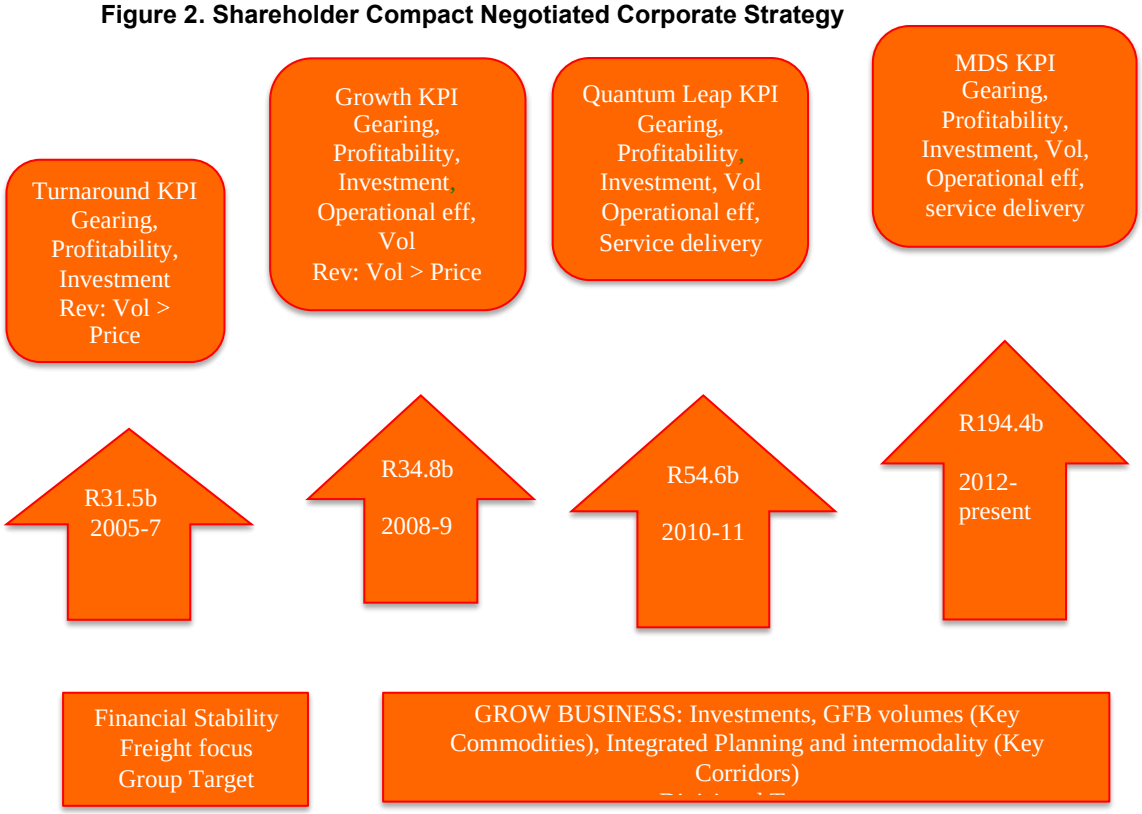
4.3 South Africa's Regulatory Regime's influence on Transnet's Corporate Strategy

Having outlined the form and policy framework to which the regulatory regime has been designated to subscribe, the discussion turns to how this has influenced Transnet's and specifically TFR's corporate strategy. The discussion is limited to the period at the start of the second policy phase, where remnants of the first policy phase were still at play and the growing awareness of SOEs strategic value as instruments of development was emerging.

The interplay between the privatisation agenda and developmental approach is at play at varying degrees throughout Transnet's restructuring journey. The market focus was particularly strong in the 4 point Turnaround plan (2005-2007) that aimed to reposition the SOE into a competitive and profitable freight logistics company. The shareholder compact

negotiated between DPE and Transnet focused on stabilizing the SOE's finances (Figure 1). This was reflected in the design of the KPIs, which primarily focused on restructuring the balance sheet; these were indicators such as: gearing below 50 percent, cash interest cover, profitability ratios (Figure 2). Investment targets were also set, however the amount was considerably limited considering the investment backlog. Given these performance criteria Transnet strategized to drive profitability by reducing the pension debt burden, privatized what it saw as non-core assets to focus on the business in logistics operations (Ramos, 2007) (see Appendix Figure 4).

Figure 2. Shareholder Compact Negotiated Corporate Strategy

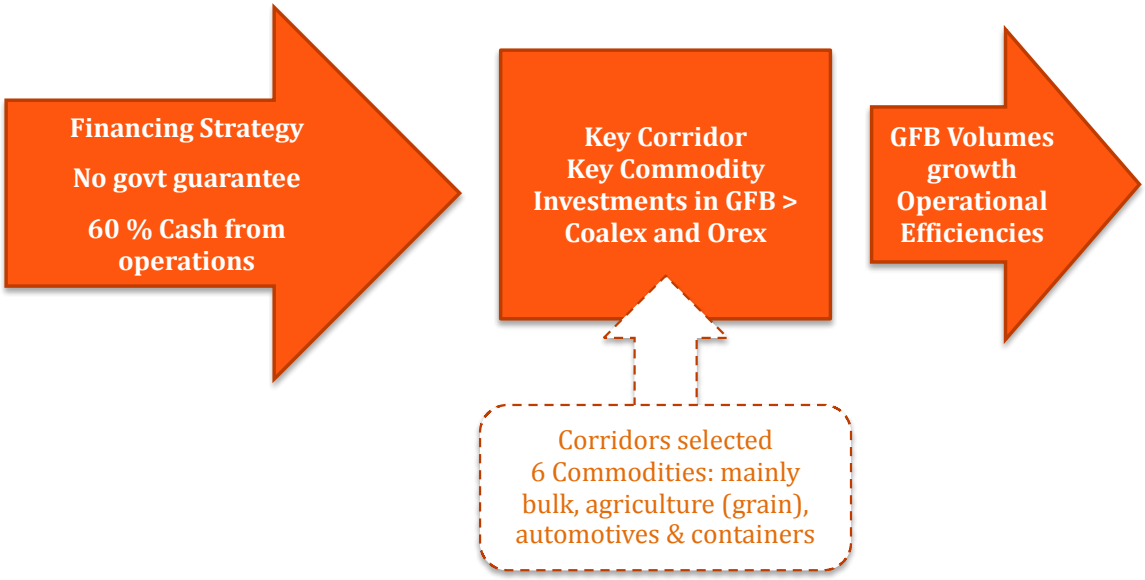


Source: Transnet Annual reports (2006-2012)

Having strengthened its financial position, both shareholder and Transnet focused on leveraging the balance sheet to grow the business (figure 1). The KPI design was improved with each successive corporate plan; namely: the Growth Strategy (2008-09), the Quantum Leap (2010-11) and the Market Demand Strategy (2012-present). Targets were set at the divisional rather than group level, investment targets were increased and were mostly targeted at TFR's general freight business (figure 2). To attract GFB customers, KPIs became focused on improving productivity/operational efficiency and service delivery; while financial performance KPIs were maintained (figure 2).

Given that investments have been a critical part of Transnet's strategy to grow the volumes in the GFB, which has been for the most a loss making operation; it becomes critical to investigate Transnet's investment financing strategy. The investigation into Transnet's financing strategy revealed what a TFR representative reflects is a constrained investment environment. This is illustrated in figure 3, which depicts Transnet's investment financing strategy, its proposed investment allocations and the intended outcome. The bulk of Transnet's investment financing has relied on cash from operations and the rest from the capital market.

Figure 3. Transnet's Financing Strategy



Source: Authors construction using Transnet Annual Reports (2007-2012)

The constrained investment environment has had two effects on Transnet's investment allocation strategy. The first is that investments have been targeted towards sustaining rather than expanding the business; and secondly investments have been largely targeted at profitable commodity groups and corridors through the key corridor and key commodity strategy. This implies that rather than expanding and diversifying the customer base, investments have aimed to entrench and grow the existing customer base that survived the restructuring. Moreover, it also implies that secondary networks and commodities served by these networks have been largely under serviced.

Figure 4 below depicts the 14 corridors designated by Transnet in the Growth Strategy. These corridors were selected on the basis of existing infrastructure, operations, organisation and important customer flows. Of the 14 corridors, six key corridors were selected on the basis of the size of volumes; namely: Richards Bay, Sishen-Saldanha, CapeCor (linking Cape Town), Sentral Hub, NatCor (Linking Durban) and SouthCor (linking Port Elizabeth and East London). Moreover key commodities were chosen on the basis of the revenue or volumes each generates along the corridors. These include coal and iron ore exports and the high value added general freight in the form of containers and automotives, lower value added bulk industrials and agriculture.

The constrained investment was promoted in the past by the DPE as a means of forcing Transnet to emulate market efficiencies by subjecting it to market forces (DPE, 2006). However, DPE has since changed tack in line with a developmental approach that holds that there needs to be less reliance on balance sheet financing in order to drive investments required to improve service delivery, economic and job growth (DPE, 2011). However besides a dividend holiday and capital injections by National Treasury for the New Multiproduct Pipeline (NMPP) the development rhetoric has not been matched by actual support in the form of an equity injection or government guarantee on bonds. The next section investigates the outcomes of the current regulatory regime at the macro level.

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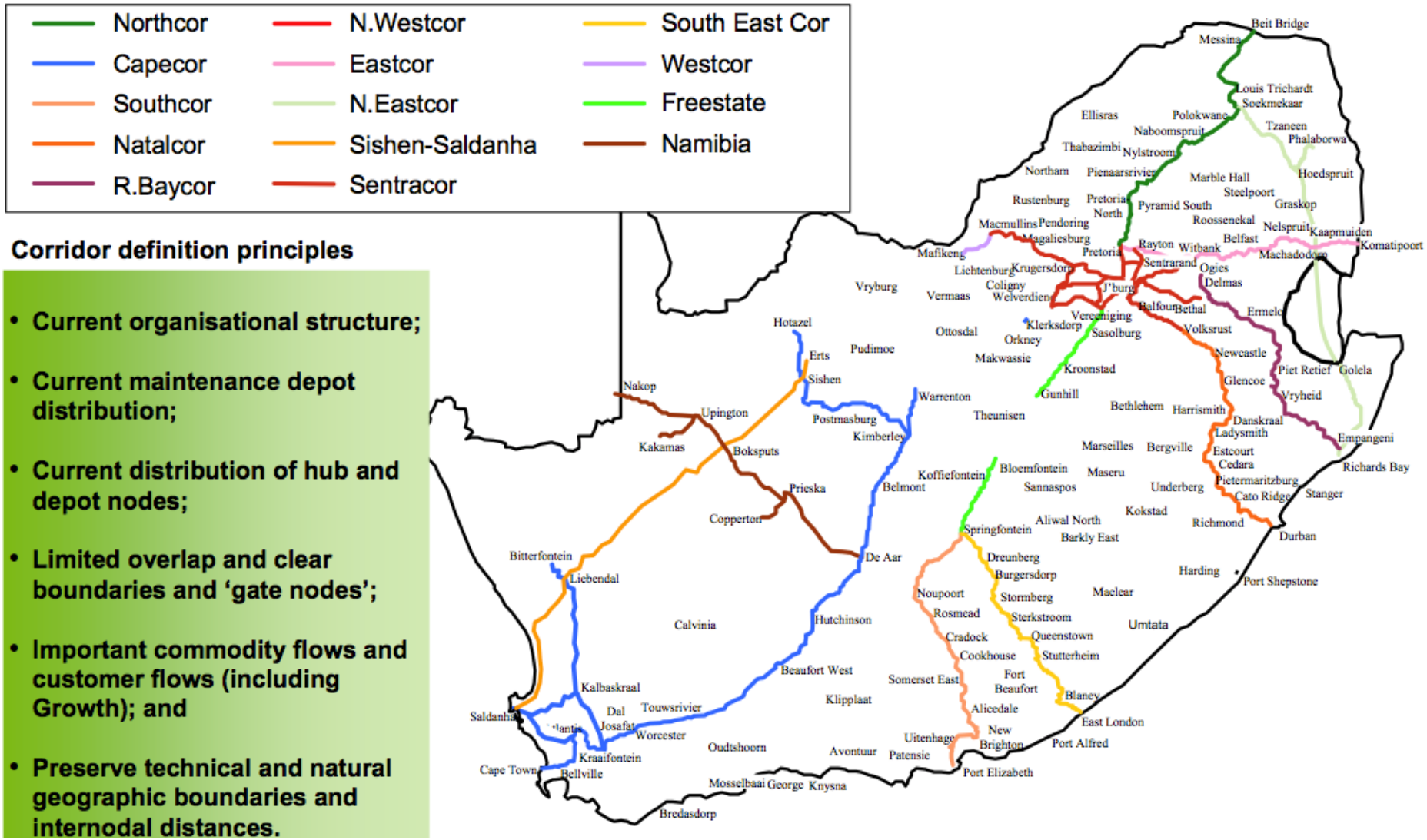

Corridor definition principles

- **Current organisational structure;**
- **Current maintenance depot distribution;**
- **Current distribution of hub and depot nodes;**
- **Limited overlap and clear boundaries and 'gate nodes';**
- **Important commodity flows and customer flows (including Growth); and**
- **Preserve technical and natural geographic boundaries and internodal distances.**

5. MACRO-LEVEL PERFORMANCE OF SOUTH AFRICA'S (NON?) REGULATORY REGIME

The section describes and evaluates the macro-level outcomes generated by the regulatory regime in the light of KPI targets set in the shareholder compact. The analysis will evaluate the performance by assessing TFR's outcomes in investment, pricing, volumes and efficiency performance in the coalex, orex and the GFB segments.

TFR has managed to meet and recently exceed investment targets (figure 5) and importantly the majority of these have been channelled towards the GFB segment (figure 6). The targeted and actual performance of the contribution of price increases and volume increases to revenue increases shows that Transnet has relied on tariff increases rather than volume increases to generate the cash required for investments; this is confirmed by the respondent in TFR however it is argued that the investments are augmented by funds raised on capital markets (Figure 7). The freight rail tariff increases have been so large, that they have since 2010 been at levels above those set by freight road operations (figure 8). This means that on average, road freight out competes the country's freight rail network on price.

Figure 9 illustrates that of the three commodity groups, GFB average tariffs are substantially higher than those of the coalex and orex lines; this makes sense given the fact that investments are mostly targeted at the GFB market segment and that the orex and coalex lines are less complex and more operationally efficient than the GFB lines. However, the relatively high tariffs that are on average at levels higher than road can possibly explain the poor performance of the GFB market. In spite of receiving the bulk share of investments, volumes have not improved (figure 10), as arguably the level of operational efficiencies at the current price level [as indicated by the locomotive productivity indicator (figure 13) and wagon turnaround time (figure 14)] are too poor to deem freight rail attractive.

What is interesting is the coalex lines volume performance. The coalex line has recorded a volume gap between actual volumes and target volumes in spite of solid and improving operational efficiencies (figure 11). In constrast, the orex line's actual volumes have kept abreast with target volumes (figure 12).

A critical reflection that can be made about the outcomes of the regulatory regime thus far is that the constrained investment environment is partially to blame for the sluggishness in the GFB segment. This is because its focus on balance sheet financing for a railway network,that has been left in disrepair for a thirty-year period, means that it places a bias on private rate of returns rather than social rate of returns. Private rate of returns have forced TFR to focus on sustaining investments rather than making expansionary investments. Sustaining investments merely maintain rather than grow and diversify the current customer base. The current customer base is already focused on a narrow set of key commodities and corridors. Importantly, the private rate of returns have also forced TFR to set prices that are currently at levels higher than road which is an anomaly in the literature as rail is generally considered to be more price competitive than road. This may be viewed as an abuse of dominance; however such sentiment must be contextualised within the constrained investment environment. The reliance on tariffs for investment has triggered a vicious circle as tariffs are increased to generate revenue for investments. But price increases then hamper growth in GFB volumes given the low operational efficiencies of the segment. However, the GFB covers a large market segment with over 100 commodities. It therefore becomes critical to unpack how different

commodities have fared under the current regulatory regime with respect to investment, access and pricing. This requires a deeper sectoral analysis.

6. MICRO-LEVEL PERFORMANCE OF SOUTH AFRICA'S REGULATORY REGIME

Given the sheer size of the GFB, a deeper inquiry at the sectoral level is required to establish how different commodity groups have been affected by the regulatory regime. Who has benefited and who has lost and under what pretext have these outcomes been generated? More importantly, can an economic regulator help to minimize the costs given the constrained investment environment?

6.1 Unpacking TFR's pricing policy and its impact on GFB access, investment and pricing

The previous section showed that its ability to unilaterally increase tariffs is vital to Transnet's investment strategy. Moreover the differential tariff levels across the main commodity segments have been set such that GFB tariffs are higher than the other commodity segments. This subsection attempts to investigate TFR's pricing policy and its implications on the GFB segment.

TFR is responsible for tariff setting and there is little to no oversight on pricing from the quasi-regulator given the legislative vacuum. TFR sets prices according to a required rate of return model adopted from the Transnet Group model and is customized to suit freight rail dynamics. Little is known about the contents of the actual model, however interviews held with TFR and Transnet corporate suggested that it is comprised of the following key row line items that are set against each column commodity: return on asset base, weighted average cost of capital (measure of risk), depreciation, tax, expenses, commodity profitability and cross-subsidy (table 4). Within each row line item are sub line items; therefore the description in table 4 is a very crude and opaque reflection of reality as TFR was unable to give further details.

Table 4. Crude Representation of TFR Pricing Model

Required Return	Coalex	Citrus	Autos
Return on Asset Base	?	?	?
WACC	?	?	?
Depreciation	?	?	?
Tax	?	?	?
Expenses - **Head office costs** - **Operating costs**	?	?	?
Volume		?	?
Cross subsidy	?	?	?

Source: Authors own construction based on interviews with Transnet

According to the interviews with TFR, return on asset base is a measure used to incentivise investments and is thus a cost recovery measure for sustaining the business. The measure will differ across commodities as the quality and operational efficiencies of the assets that

serve particular commodities differs widely. Therefore the return on asset base will be higher for coalex than assets that move citrus products given the quality of the coalex assets. However linked to the cost recovery process is the consideration of the profitability of the commodity as TFR will try to capture the windfalls in profits by pricing higher. Therefore TFR follows the Ramsey pricing strategy in principle as it sets the price at a level the market can bear. Therefore a higher tariff will be set on a commodity in periods of high profitability and will be set lower in loss making periods. It is difficult to tell whether the profits generated by the commodity in question are reinvested in the assets it uses due to the workings of cross subsidization that support TFRs lossmaking operations.

Expenses are also critical to TFR's differentiated pricing strategy. Expenses are divided into head office costs, and then those induced by the commodity i.e. operating costs. Head office costs include taxes, depreciation and other expenses. Interviews with Transnet Group reveals that head office costs may be distributed either according to the number of staff or the volumes moved. Operating costs generated by the commodity will be induced in relation to the underlying network that supports the transportation of that commodity.

Tariffs are therefore differentiated as a function of the degree to which the underlying network is differentiated. This is due to the fact that a differentiated network technology has high operating costs and inefficiencies as locomotives and wagons must be changed along the route to suite the characteristics of that particular route. Therefore this information is thus used to allocate costs across the network. Table 5 rates the key components of the country's underlying network technology in accordance to the level of its standardization. Attention is drawn to those components rated as having an unacceptable level of standardization; namely: traction type, gradients and curves, train control, locomotives and wagons.

Traction type: rail traction is the amount of power used to electrify the move of a train. Railways with differentiated traction types have to accommodate trains that pass from one system to another by changing locomotives in a switching station to ensure that the train is aligned to the power of a specific system. High operating costs are borne from the switching stations as they operate expensive machinery and equipment, result in low locomotive utilization and interrupted consignment throughput.

Gradients and curves: corridors were not designed with the same characteristics with varied gradients and curves. Consequently, locomotives are often underutilized as traction power must be dispensed on locomotives for steep slopes along the route which is not used for most of the route. "Non-standardised curves result in different speed profiles between trains that further limit line capacity".

Locomotives: the large variety of locomotives and wagons increases maintenance costs

Transnet's own assessment of the railway network is that it generally has unacceptable levels of standardization (table 5). The implication is that operating costs will be higher and therefore less competitive than benchmarked best-practice levels. However these complexities are more acute in the general freight line than in coalex and orex lines (table 6). The coal and iron ore export lines both enjoy dedicated lines, have dedicated rolling stock, have less loading points, shorter route length, one destination point, standard axle load, one commodity, standard track types and standardized traction along their lines (table 6). The GFB network characteristics are: shared railway lines with passenger rail, has partial dedicated rolling stock, many destination points and commodities and varied axle loads (although standard on the main corridors), track types and train traction. Consequently tariffs will tend to be higher for the GFB in order to recover operating costs.

Table 5. Transnet Assessment of Network Standardisation

Topic	Comments	Status
Gauge	Single gauge on main lines	
Axle load	Main corridors 20t/axle	
Traction types	Corridors not standardised	
Gradients and curves	Corridors not standardised	
Train control	Corridors not standardised	
Locomotives	± 20 main classes	
Wagons	> 80 groups	
Operating philosophy	Unit loads, wagon loads	
Customer base	> 800 consolidate	
Commodity base	Substantial	

Legend

Good | Acceptable | Not acceptable

Table 1: Status quo assessment heat map

Source: Transnet 2030 Rail Development Plan (2013)

Table 6. Comparison of Coalex, Orex and GFB network complexity

Feature	Coal Export Line	Iron Ore Export Line	General Freight
Tons/Year (07/08)	63,5m	32m	84,5m
Revenue/Year (07/08)	R3,3b	R1,2b	R11,2b
Average Length of Haul	573km	879km	553km
Type of traffic	Freight only	Freight only	Freight + Passengers
Route length	573km	879km	About 22 000km
Track type	Double	Single	Single + Double
Axle Load	26t	30t	11,5t to 20t
Max train length (Wagons)	200	342	104
Max Nett Ton/Train	17 000t	34 200t	6 552t
Traction	3kV DC + 25kV AC	50kV AC (+ Diesel)	3kV DC + 25kV AC + Diesel
Braking System	Air	Air	Air + Vacuum
Dedicated rolling stock	Yes	Yes	Partially
Unit load traffic	100%	100%	60%
Loading Points (07/08)	44	2	2 244
Destination Points (07/08)	1	1	2 373
Commodities (07/08)	1	1	714

Source: Transnet (2008) Rail Planning Workshop and MultiRail User's

Importantly tariffs are also set according to the volumes moved. Volumes do not only determine price but also the level of service and access. Access rules are generally determined by TFR. Transnet's key commodity and key corridor strategy introduced in the Growth Strategy, changed the manner in which service and operational planning takes place in TFR and thus the manner in which access is granted on the network and prices are devised. The Zero Based Plan is a service plan aimed at maximising capacity utilisation and operational efficiencies on the freight rail network. The plan aimed to increase capacity utilisation and operational efficiencies by redesigning TFR's service plan in a manner that increases freight density on the core lines; namely: Sishen, CapeCor, SouthCor, NatCor and Sentral Hub.

The Zero Based Plan was meant to be based on the following key pillars:

a. fixed simple and repetitive weekly train
b. maximum number of mandatory trains and provide capacity for additional traffic
c. minimum number of times wagon is handled to improve transit times and wagon turnaround time

From these pillars emerged a differential service plan which attempted to accommodate both frequent and infrequent commodity transits and is currently in operation. There are three types of services offered by TFR; MegaRail, the FlexiRail and AccessRail. The MegaRail is a priority service operating a minimum of 30 fully loaded wagons on a fixed train plan that is drawn up at minimum a year in advance that spells out the schedules (days and times) of the train run and the price to be charged. The plan can only be changed with a month's notice before the quarter with Transnet's agreement, and operates on a take or pay system i.e. you pay for the slot even whether or not you loaded your train on the day. The service enjoys pre–allocated locomotives, crew, slots and wagons and has frequent train runs (minimum of 5 per week) and operates from hub to hub or terminal to terminal. This is a more price competitive service as there is more transit per ton km running frequently.

Once resources have been fully utilized for the MegaRail, TFR then avails capacity to the pricier AccessRail and FlexiRail. These are pricier as the operations are less regular. The AccessRail operates block trains originating from other train moves and then ends at a hub or terminal. This service operates on a regular basis that the FlexiRail, which carries ad hoc loads to accommodate sudden unscheduled demand. This implies that the GFB tariffs will tend to be higher than the ore export lines with respect to volumes as it has lower densities than the ore export lines.

Table 7. Transnet Freight Rail Key Accounts

Key Account	Major Clients	Service	Corridor
Fertiliser	Omnia, Kynoch, Foskor, Sasol Nitro, Great Lakes Logistics, TALSA, Agrimol EDMS, SA Feeds Phosphate, Nitrophate, Nirtophoska, SA Feeds IMPEX	MegaRail - 68% FlexiRail - 9% AccessRail - 23%	RbayCor RbayCor, CapeCor & NatalCor
Grain	Major Millers, Coops, Grain Traders, Third Party Logistics Companies and Shipping Lines	AccessRail - 80%	SouthCor, NatalCor, CapeCor
Coal	Coal Mines, Traders, Coal Product Industry and Power Utility	MegaRail	Rbay, NatalCor, MaputoCor
Container	8 contracts with Major Container Companies	Not given	City Deep
Cement	Lafarge, AfriSam, Natal Portland Cement, PCC, Idwala Industrials, Lime Producers, BPB Gypsium, Slagmet	Dedicated trains	Countrywide
Automotives	BMW, NISSAN, TOYOTA, FORD, GMSA	CKU - Containers CBU - dedicated trains	NatalCor, SouthCor,
Granite	Marlin Granite, RED Graniti, Eagle Granite	Dedicated Trains	Not given
Feul	BP, ENGEN, SHELL, SASOL, CALTEX, TOTAL, Afrox, Easigas, Puregas	Mega Rail - jet fuel FlexiRail AccessRail	Not given
Chemicals	Sasol, Karbochem, Bordic, Dow Plastics, Lever Ponds, Somchem, Isegen SA, Logis, Olivine, AEL and	White Mamba - 5 times per week Green Mamba - 2 times a week Butadien Gas Train - 1 per week	RBayCor, NatalCor
Steel, Timber, Other Minerals and Non Ferrous Metals	Not given	Multi-purpose and specialised wagons, containers	Countrywide
Chrome & Manganese	Not given	Not given	Not given

Source: Authors Construction using Transnet website

There are two types of customer's: those that are served directly by TFR (also known as key account holders) and those that are served by one of 8 logistics companies with key accounts contracted by TFR. Containers are served by logistics companies. These logistics companies are contracted through a competitive tender process. To obtain a key account, the customer submits a volume projection to the TFR marketing/customer service personal and is prepared to pay an annual fee for its upkeep if slots are available. TFR sector teams will organize access by identifying slots for the year, negotiate contracts and oversee the service of the contract. However critical to the decision to provide a slot is the volume, the regularity of train moves and the availability of locomotives and personnel.

It is quite apparent that the GFB segment will be priced higher than the ore lines given the latter's volume densities and the unacceptable levels of standardization and network complexities along the GFB lines. However, that the pricing bias falls against GFB is partially a question of history than only a technical matter. Past investment decisions have produced a highly complex GFB network and a simpler network for the ore lines. Importantly, the simplicity in the ore line network was brought about by decree through Acts ordering the construction of dedicated railway lines and the port of Saldana and direct involvement by coal industry in the expansion of the coalex. Added to this was the decision taken in 1986 not to invest in freight rail; investments however were limited to the ore lines. Recent investments have done little to change the underlying structure of the network as they are focused on sustaining the network. Arguably these biases are behind the vicious circle that hampers GFB volume growth triggered by an investment strategy that relies heavily on tariffs whilst supported by capital markets.

6.2 Sectoral Analysis of Regulatory Regime Outcomes

The discussion thus far has revealed that the constrained investment environment has forced TFR to rationalise investments in profitable commodities and corridors. It has also shown that the constrained investment environment has produced a pricing regime that works against the GFB and has thus contributed to the sluggishness in GFB volumes. This is due to the fact that the magnitude of the underlying network deficiencies along the GFB lines dwarfs the investments such a regime can generate to minimise the operating costs on the network. The section uses case studies of on-going disputes within the coalex, citrus exports and auto assembly to investigate the outcomes of the regulatory regime at the sectoral level. The section will also address the role that economic regulation can play in addressing these disputes as a means of driving greater volumes in the GFB by reflecting on how other country regulatory regimes (Canada, US and Australia) would handle such disputes.

The cases reveal a range of on-going or unresolved disputes over the regulatory regime's investment, pricing and access decisions that are holding ransom the aim of economic and industrial policy to ensure a competitive and efficient logistics system for industrial development.The ongoing disputes over the coalex line in particular are highly problematic as they are preventing the possible shared use of that infrastructure by players within the sector (i.e. junior miners) and other sectors (such as citrus) if investigations by a credible dispute settlement process with decision making, investigative and enforcement powers reveal that indeed some coal miners cannot fulfill their orders due to structural constraints in the sector (see Box 1).

Canada's regulatory regime would handle the coalex-TFR slow contractual agreement by allowing complaints to be forwarded to the regulator for arbitration to which the complainant has the burden of proof (Padova, 2007:3). Therefore, coalex miners would have to prove that they have the volumes, that they have made investments that meet their orders and have the potential to exceed the annualized 70 mt target to justify expansionary rail investments. There is the possibility that neither party will come forward to build a case, in which case a more pro-active regulatory regime would set a limit to the duration of contractual negotiation. If the time frame is exceeded, then the regulator empowered by investigative powers would step in to investigate the dispute. Therefore this proactive regulatory process ensures that negotiations do not hold the line to ransom; while at the same time it acts as an incentive for the railway service provider and the customer to come to an agreement.

In addition, the presence of long term contracts strengthens the need for a regulator. At one level, long term contracts are sensible to ensure the financing of the lumpy investment. As highlighted by the investment decision's literature mentioned in section 2, unregulated railways tend not to invest in capacity in spite of demand pressures. This is because railways lack the trust that current demand pressures will be maintained to overcome investment risks (e.g. decline in commodity profitability and increasing input costs) generated by long lead times for project completion. Therefore long-term contracts are used to guarantee the financing of the projects. However, the process depends on the railways foresight (which over a 10 year period is long) and negotiating strength that the negotiated tariff escalation will indeed absorb the project costs during the duration of the contract as the failure to do this would result in other users cross subsiding the project costs. Therefore a regulator is required to ensure the contracts do not result in anti-competitive price discrimination. Furthermore, there is the recent experience in South Africa regarding the re-examination and possibly retrospective amendment of long-term electricity contracts that were originally approved only by the Eskom Board of the time and were concluded in the absence of any regulatory scrutiny. There is a danger that this is being repeated in rail freight currently. Many of the multibillion rand Transnet rail freight infrastructure procurement contracts as well as the long-term freight transport contracts for coal, iron ore, manganese and other commodities are currently being approved only by the Transnet Board in the absence of any regulatory scrutiny. The cross-subsidies that might be associated with the tariffs agreed to under these contracts are currently known only to Transnet and could have significant adverse national economic consequences in the future.

Box 1. Accounting for Coalex Volume GAP: Investment and Access Disputes

Significance of Coalex to economic and industrial policy

- Supporting coal exports within the scope of an emerging energy security policy
- Promoting local supply of goods and services for maintaining and upgrading Coalex
- Leveraging access to Coalex in support of policies for broadening economic participation to BEE/junior miners

Historical Context

- The development of South Africa's coal industry is intricately linked with the development of what Fine and Rustomjee (1997) refer to as the Minerals and Energy Complex; i.e. a system of accumulation based on mineral, energy and capital intensive activities nurtured by a conflicted coalition between the state, Imperial and Afrikaner capital. Coal mines were owned by gold mining companies during the first half of the 20th Century; providing a source of fuel to the diamond and gold mining industry. The industry was controlled by cartels. The notable ones were the Transvaal Coal Owners Association (TCOA) established in 1908 to end ruinous competition and the Natal Association Collieries. These associations were important in the shaping of the country's energy policy as representing industry's positions influential advisory bodies. The TCOA (which was admitted into the Chamber of Mines) was the most powerful. The TCOA had the largest membership and controlled the export supply chain as it coordinated production between collieries for large exports until the 1970s. Non-TCOA members were admitted to the cartel once they had demonstrated that they possessed significant market power. The state's decision to promote industrialisation through cheap energy led to a series of price controls and export restrictions that made South Africa's coal amongst the cheapest in the world and reduced coal exports to 2 percent of production between 1950-1970.
- A coal contract between the TCOA and seven Japanese steel mills in 1971 for 27 MT of coal over a 10 year period. The TCOA was subsequently dissolved in the 1980s. Coal exports were increased from 100,000 tonnes in 1972 to 2.7 mtpa between 1976 and 1986. One of the conditions of the contract was expanding rail and the Richards Bay Port capacity. The TCOA and the government brokered an agreement in which rail capacity would be built by the state through financing guaranteed by the TCOA; and the Richards Bay Coal Terminal would be built, financed and managed by coal exporters. The contracted investments would generate tonnages that subsequently exceeded the TCOA and Japanese contract. The cooperation between the state and the coal exporters arranged through long term contracts facilitated the investments required for the rail and port infrastructures; which boosted exports over the period.

Current Market Context

- South African coal seams stretch over the Free State, Mpumalanga, Limpopo and Western Natal regions. Coal mining was historically conducted in western Natal, however exploitation subsequently shifted to the Central Basin which includes Ermelo, Witbank and the Highveld coal fields due to over exploitation. Recent exploration of the Waterberg will shift production to that region subject to infrastructure provision (especially rail and water) as the Central Basin is poised to reach peak production during the course of the decade (Eberhard, 2011: 2). The country mostly mines bituminous or thermal grade coal (96 % reserves), which is used in electricity generation; other coal types mined are anthracite (2% reserves) and metallurgical coal (2% reserves). Coal production is highly concentrated with 5 producers controlling 80 % of production. South Africa is one of the leading coal producer, exporter and consumer countries in the world ranked 6th in 2012 in each (see Appendix figure 15-17). While other leading producing countries increased their production and exports over the period (aside from China), South Africa's volumes have either increased by a slight margin (production and consumption) or slightly declined (exports) over the 2000-2012 period. The bulk share of the country's coal production is for local consumption while the remainder is for export (figure 18). Local sales of coal experienced a rise over the period, but have seem to have fallen since their peak in 2008. Export sales for coal were stagnant over the period in spite of rising prices until 2011 (figure 19) but have marginally picked up in volume since 2008.

Network Access for Export Coal

- 100% of mostly high grade thermal coal is railed on a dedicated rail line built from a hub in Ermelo to Terminals in Richards Bay using the MegaRail Service Plan for export (figure 20). The majority of the export coal is railed to the privately owned Richards Bay Coal Terminal. Around 70 mpta rail capacity is allocated annually and is then distributed monthly and then weekly via contract. Contracts are a negotiated outcome between TFR and individual coal companies as coal producers have some leverage given the oligopolistic nature of the coal market and the volume densities generated on the dedicated line.

Box 1 Accounting for the Coalex Volume Gap: Investment and Access Dispute Continued

Investment Dispute

- As mentioned above, the coalex line has been the recipient of continuous investments since the 1970s facilitated by long term contracts between the State and the major coal exporters. Recent investments were facilitated through 10 year long term contracts which helped TFR to recover the risk of investments through volumes guaranteed by a take or pay system (i.e. customer pays irrespective of whether or not it met its contracted order for the day) (Eberhard, 2011: 20). The historical 'cooperative' investment relationship between major coal exporters has been fractured since the last long term contract came to an end in 2005 due to an investment dispute between major coal exporters and TFR (Eberhard, 2011). Some majors contest that they are constrained from maximizing the port capacity at Richards Bay Coal Terminal (which has 91 mtpa capacity), as TFR's cross subsidisation of coal earnings for the GFB business has lead to under-investments in rail capacity, major inefficiencies and uncompetitive tariffs for Coalex (Eberhard, 2011: 20). However, TFR argues that some majors often cannot fulfill their orders on time due to under-investment in coal mining as the Central Basin seams are shallow and now have a short life span. Currently there is no contract that governs the relationship between TFR and the coal mining companies, rather the relationship is governed by a "term sheet" negotiated quarterly while a parallel process is under way to negotiate the 10 year contract.
- There is an on-going dispute between TFR and junior miners on the one side and major miners on the other about access onto the rail-port logistics system. Juniors and TFR argue that majors are blocking access to the RBCT port by not increasing the Black Economic Empowerment-negotiated Quattro allocation to the RBCT. This according to junior miners has forced the juniors to sell to majors at lower than export prices. Majors argue that juniors cannot even make up their current quota allocation of 4 Mt, and argue that they will not increase Quattro allocation until the rail capacity is increased.
- Not resolving these issues is impeding the expansion of national coal exports and could also be blocking potential access to the network by juniors and general freight if it is true that coal miners are structurally constrained from fulfilling orders.

The citrus case is a classic example of the effect of Transnet's key commodity key corridor strategy on branchline freight cargo. Changes in logistics technology towards containerisation, the disinvestments in branchlines and a fragmented supply chain brought about by the deregulation of transporation have led to the sharp fall in citrus moved on rail relative to road from 80 percent in 2005 to 5 percent in 2013 (see Box 2). This has been compounded by a pricing regime in which the freight rail tariff set by the third party logistics companies contracted by TFR is similar to road, therefore making the rail services uncompetitive given current poor service levels. TFR argues that the sharp drop in freight rail services can be generalised across a range of agricultural commodities as a result of the decision to cut investments in branchlines. Even the most serviced agricultural commodity, grain, has experienced a drop from 90 percent to 30 percent.

Box 2. Accounting for no Citrus Volumes on Rail

Significance to economic and industrial policy

- New Growth Path targets rural development and agricultural sector for labour intensive growth. Industrial Policy targets regional industrialisation
- Many citrus and other agricultural sectors have historically been linked to the national rail network through secondary branch rail lines which have been de-prioritised by TFR
- Rail freight can potentially enhance the competitiveness of the targeted agricultural and labour-intensive sectors

Citrus Market and Logistics Dynamics

- There are over 1000 citrus growers in Western and Eastern Cape and in Northern Region (Limpopo, Mpumalanga, Zimbabwe and Swaziland). The sector employs between 100,000 and 400,000 workers, depending on seasonality. The Northern region produces 800,000 pallets annually. During peak seasons, 4,800 FEU (i.e. twenty foot equivalent) containers are transported to the port annually. Approximately 60 percent of citrus produce is exported (table 11).
- Logistic cost for Northern region amount to 60% of revenue and about 25 % of these costs are land freight logistics. In 2005, 80 percent of the Northern region volumes were transported by rail. Rails contribution to citrus transportation has dropped significantly to 5 % by 2009.

Investment Needs for Citrus Exports

- Historically citrus was transported on rail using open wagons but market dynamics in the last 5 years have shifted towards containers. The industry argues that there is a need for more 240 reefer containers operating on a 6 day week as 80 percent of citrus exports are transported via containers. According to the Citrus Growers Association, the deregulation of transport and agricultural boards fragmented the export supply chain. The deregulation of road transport, the termination of the end to end service provided by Freight Dynamics (TFR's road freight comapany) due to its privatisation and the removal of the rail subsidy for agricultural products made road more competitive with rail. Agricultural boards created a centralized export distribution chain. Therefore industry argues that there is a need for a hub in Limpopo to centralize the supply chain.

Investment Dispute

- The Citrus Growers Association argues that TFR deemed citrus rail unfriendly due to its seasonality and thus started to disinvest to focus on iron ore and coal. Disinvestment was compounded by the key corridor key commodity strategy, which cut operations on branch lines to focus on main lines. This culminated in TFR removing citrus from the network linking the Northern region through the Swazi loop to Richards Bay in favour of bulk commodities. Currently 350 trucks transport citrus to Durban per day. Congestions caused by truck traffic at the port, undermines the cold chain required for citrus exports which would be minimised by rail as the cargo would be railed directly to the newly constructed Fruit and Vegetable Terminal at one go. Since the Quantum Leap Strategy, Transnet has been promising investments; however industry argues that these have not been forthcoming. Moreover, the association argues that the meagre investment made by TFR came to a waste as TFR failed to consult industry to customize the containers according to dimensions required to make the containers cost advantageous.

Pricing Dispute

- Transnet's relationship with third party logistics companies has evolved from being strained to cooperative in recent times. The strains in the relationship were rooted in what was perceived by the road fraternity as rail's undue dominance in land freight transportation due to the support it received from a highly regulated environment and Transnet's abuse of market power. The deregulation of transportation in the 1980s made road more competitive. However Transnet maintained some level of dominance through a policy which barred freight road operators from entry into the ports within a 30 km radius. This policy made road uncompetitive as it forced the road operators to make use of Transnet's road logistics company which added to the shippers costs. The road operators took legal action against Transnet and the policy was eventually repealed. This eventually precipitated in Transnet spinning off its road logistics company, freight dynamics, as part of the Turnaround restructuring programme. Transnet began to use intermediary service providers to handle some of its accounts after a period of mistrust between itself and the road freight fraternity out of which the 8 currently contracted logistics companies have emerged. There is no Transnet pricing policy that guides the charges that are implemented by the contracted logistics companies. Therefore their pricing practices are not regulated by Transnet.
- The citrus logistics system operated on an intermodal basis in which road and rail was used for end-to-end transportation supplied by Transnet. This subsequently changed when citrus made use of containers and TFR used the contracted logistics companies to manage the container accounts. Industry argues that unregulated third party logistics companies are charging prices similar to road, making rail uncompetitive due to rail's current service offering. 2010 prices reveal that the price difference was R33 for 28 standard pallets containers and R52 for 26 standard pallets containers. Industry argues that a key account would see a more competitive price. However a key account is constrained by TFR policy's that container customers can only operate through

Citrus growers seek investments in customised containers and an inland hub from which to centralise the supply chain, however these investments have not been forthcoming. The Australian regulatory regime's handling of the citrus case would have the infrastructure owner respond to the access seeker within 30 days with an indicative capacity assessment; after which, negotiations for entry begin (Queensland Government, 2010). If the indicative capacity assessment finds that there is no capacity then the infrastructure owner must produce a work programme for expansion (Queensland Government, 2010). However 60 percent of the access seekers in the industry would have to sign a contractual agreement with the infrastructure owner that they will make use of the new investment and that this will be fed into the tariff charged over a particular time with penalties for non-delivery (Queensland Government, 2010).

The critical question is that: given the size of the investment backlog due to investment decisions taken in the past, would citrus growers be able to afford the tariff required for the investment? This question goes to the very heart of the fact that the current regulatory regime benefits existing users of the infrastructure that have always been prioritized rather than 'new' or neglected users. An interview with the Citrus Growers Association revealed that a subsidy on the rail tariff would be required to level the playing field. One way around this is for the regulator to recommend that a provision in the Succession Act that obliges the state to make funds available for any project vital to economic development be used to finance the investment. Even the most efficient freight railroads in North America make use of public financing for their investments. However, stakeholder interviews revealed that there is resistance within Transnet towards making use of this provision due to fears that the capital injection from the state would result in Transnet's losing its prized autonomy as the state will have the right to meddle in the SOE's affairs.

Beyond the capital injection, is the more fundamental question of whether or not citrus should be considered as a rail friendly commodity. TFR considers citrus as a rail unfriendly commodity due to its seasonality; the implication of which is that the costs of the investment will not be recovered in full during off-peak seasons and thus the capacity would lie idle[1]. This is clearly an indictement on most agricultural produce as by TFR's definition, agriculture would be underserved by rail. Indeed Transnet has conceded that most agricultural commodity volumes have had similar declines in rail as those experienced by citrus [2]. Moreover even where agricultural produce has been maintained on Transnet's accounts, the size of the rail share has declined drastically and has been maintained for food security reasons rather than for profitability. For instance the grain account has declined from 90 percent to 30 percent and has only been maintained for food security reasons rather than for profitability.

The citrus case study also highlights issues with TFR's pricing regime. An Australian regulator would handle the citrus farmers pricing disputes by either calculating a reference price that is implemented if the decision after an investigation into a complaint deems it necessary; or by setting a maximum or minimum rate within which the rail service provider and customer must negotiate (Queensland Government, 2010). The US regulator uses a similar reference pricing system (Drew, np:35).However, it appears from the case that the outcome of the pricing regime is in part a function of TFR's relationship with the logistics companies it sub-contracts. It is not altogether clear from this research project exactly how TFR regulates prices set by the logistics companies it sub-contracts to provide a service its customers, if at all. Further

[1] This is confirmed from an interview with TFR.

[2] This came out of an external seminar in which TFR was amongst the many participants

inquiry is necessary to determine whether or not this may be a potential area that a regulator would have to regulate.

Box 3. Shareholder, TFR and Auto-Assembly Special Arrangements

Economic and Industrial Policy

- Sector has received industrial policy support since the 1960s due to linkages/spillovers, technology and employment
- The auto industry continues to be a priority industrial policy sector

Market Dynamics

- The South African automotive industry is the bedrock of the country's manufacturing capabilities in light of its contribution to manufacturing value added, GDP (7 % in 2012) and employment (table 10). The flagship industrial policy programme, Motor Industry Development Programme, positioned itself as a sub-contracting hub of a complex, dynamic global value chain geared to supplying the North American, European and African markets. An efficient and competitive logistics system is therefore required to maintain and grow its position within the value chain.

Network Access

- There are four inland producers located in Roslyn Gauteng, 600 km from the port of Durban. The bulk share of cargo transported in containers and on wagons uses the Durban Corridor. A small consignment of cargo has recently made its way through the port of Maputo, which is the closest port.
- 90 % of Completely Knocked Down (CKD) kits containers and 10-30% CBU wagons travels on rail

Investment and service disputes:

- Industry claims that TFR cannot live up to the service agreement as it is unreliable. The unreliable service is detrimental to its global logistics chain and undermines the ability of local producers to negotiate further investments into the country with corporate head offices in Europe.
- TFR acknowledges that its service standards over the years have been low and argues that its capital investment programmes are being leveraged to improve its service to customers.

Solutions:

- Industrial policy alignment introduced recent investments in customised wagons through TFR-auto sector design partnership. The auto-sector's activism and the growing alignment between industrial policy and DPE's strategic orientation has spurred the quasi-regulator's involvement to remove the stumbling blocks found in the industry. The partnership between assemblers, TFR and the quasi-regulator has been formalized by the State Owned Companies Automotive Competitive Forum to remove the stumbling blocks in electricity and transport supply with Ministerial support. Projects are targeted towards wagons as containers are complex.
- On the transport side, the collaboration between NAAMSA and Transnet has resulted in the Customer Focused Commodity Strategy for the Automotive Sector (see table 12). The strategy has a number of projects that include infrastructure investments and system improvements. A notable milestone is that the Minister has charged the sector with developing a dashboard of key performance indicators that measures the performance of TFR's auto sector service delivery mandate. This tool will be used by the DPE to monitor TFR's service delivery performance.
- The auto assembly industry has used the platform provided by the SOC Automotive Competitive Forum to lobby diversify their freight across three corridors namely: SouthCor, DurbanCor and MaputoCor in order to deal with congestion challenges at the DurbanCor. SouthCor's desitination is the furthest away from point of origin therefore part of the proposal is to have price equalization between the SouthCor and DurbanCor so that it is competitive.

The auto sector, like many of TFR's customers, has been unsatisfied with TFRs service quality arguing that it is unreliable which undermines the sector's insertion into the auto's global value chain. However, the auto assembly sector has been lobbying vigorously to ensure that the freight rail services it receives from TFR are improved. The auto assembly case confirms the notion that under the current regulatory regime, resource allocation and access benefits those currently served by the network and more recently this has been aided by the shareholder arrangements in order to serve industrial policy. This may be viewed as positive as it is a reflection of the alignment between industrial policy and freight rail investment strategies. However a closer reflection reveals that the current arrangement reflects the interest of the strong and entrenched vested interest (auto-assemblers) while the component manufactures, the labour intensive and high value added segment of the industry, are left out of the process. Certainly, the inclusion of this segment of the auto-sector would have changed the resource allocations to include containers as part of the arrangement. Containers have been left out of the arrangement due to their complexity. Therefore the alignment between the shareholder auto sector arrangement and industrial policy is partial. Moreover, it reveals that similar to the citrus case, containers are not well prioritized within TFR's investment strategy. The implication is that TFR's investment strategy is unlikely to serve rail friendly value added goods.

The section had two objectives. Firstly, the section aimed to investigate TFR's pricing policy impact on the GFB segments pricing regime. It was shown that the GFB will tend to be priced higher as a result of lower volumes and unacceptable levels of network deficiencies whilst the ore lines will be more competitively priced as a result of higher volumes and a superior network. However, the reasons for lower volumes in the GFB may be an outcome of inefficiencies and lower services which are in part as a result of the neglect of the network. Secondly, the section aimed to investigate the possible causes for the sluggishness in the GFB through a case study approach of two GFB sectors (citrus and auto assembly) and the coalex line. The case studies revealed a range of on-going or unresolved disputes in the form of investment, pricing and access that are holding the aim of economic and industrial policy to ensure a competitive and efficient logistics system to randsome. Disputes within coalex in particular are preventing the possible shared use of that infrastructure by others within the sector or other sectors if investigations by a credible dispute settlement process reveal that certain coal miners cannot fulfill their orders. The selective involvement by the shareholder in the auto sector may be viewed as in tune with industrial policy priorities, however this may be disputed by the fact the shareholder's support is of the auto assembly subsector and not the labour intensive and value creating auto component subsector. The involvement of the component sector would have ensured that containers are made a part of the arrangements. The lack of priority containers receive due to the use of unregulated third party container logistic companies and the negative impact this has on price is show cases in the citrus case. Moreover, the citrus case also shows the neglect of agriculture in general in TFR's investment decisions. These cases along with the discussion thus far demonstrate the need for reform which is the subject of the next section.

7. SOUTH AFRICA'S FREIGHT RAIL REGULATORY REFORM PROCESS

The micro-level analysis highlighted a range of on-going or unsettled disputes between the railway service provider and customers. These issues are well understood by the main actors within the regulatory regime, namely DPE, DoT and TFR. It is for this reason that a regulatory reform process was initiated in 2005; however this initiative has not gained much traction due to contests within the policy space.

All the main actors are in agreement that there is a need for an economic regulator to regulate pricing and access contests, however the actors disagree on the reform process that should be followed and its end state (Table 8). Interviews with the DoT reveal that the end game is for a privatised freight railway network, which reflects the position held in the NFLS. According to this view, privatisation will generate investments, drive competitiveness and increase output and service levels. However the DoT argues that privatisation must be preceded by a series of gradual reform steps. The first step is to gazette the draft Rail Green Paper, which was due to be published for comment in the first quarter of 2012 but has not been published as yet. The Green Paper will set the platform for the development of a Rail Act to set up an economic rail regulator that will regulate the sector. The second step is to privatise the cash generating ore lines and use the capital to finance improvements in the GFB, which is viewed as a market failure, until it is safe over the longer term to privatise the GFB. Branchlines are to be concessioned to private participants. The National Treasury, which is involved in the process is also of the view that the orex and coalex lines should be commercialised so that capital is raised to improve the GFB. This would ensure that the state is more focused on dealing with the market failures in the GFB.

Table 8. Policy Debate on Freight Regulatory Reform Process

DoT	**DPE**
- **Regulator is Important: price and access** - **End Game: Privatisation of TFR** - **Process: White paper → STER reporting to Parliament 10 yrs** - **Interim process: Interim regulator, Rail policy Green Paper, branchline concession**	- **Regulator is Important: price and access** - **End Game: No privatisation to align with Presidence and govt policy** - **Process: Land Freight Policy creating intermodal competitive neutrality → Regulator** - **Interrim process: branchline concession**
Industry	**TFR**
- Regulator is important: price and access - End Game: Privatisation but ensure at least 2 companies to ensure competition – Autos; Coal we will run it like in Australia.	- Regulator is important: price and access - End Game: No privatisation to align with Presidency and govt policy - Process: Land Policy Freight Policy creating intermodal competitive neutrality → regulator - Interrim process: branchline concession, special deals with mega customers

Source: Authors construction from stakeholder interviews

The DoT believes that the Green Paper-Rail Act process short circuits a longer reform process, which may take up to 10 years, currently taking place in parallel. The longer reform process would ideally begin with the development of a new Transport White Paper to replace the 1996 version. The White Paper will provide the platform for the formation of a Single Transport Economic Regulator (STER). However, to short circuit the policy-act process, the current process underway is the development of the STER Bill, which is being conducted by a consultant. There are four modes of transport that are being considered: rail, road, maritime and ports. The DoT is the lead department in this project and is supported by the National Treasury and the DPE and TFR are also involved.

Both the DPE and TFR maintain that the privatisation of the freight rail system contradicts government's developmental agenda as spelt out in section 3. The envisioned end-state market structure has thus been a key issue withholding further movement in the policy process. Moreover the DPE is in opposition to DoT's short circuit reform process as it undermines the viability of the freight rail mode. According to the DPE, freight rail's viability is currently undermined because while Transnet has to raise financing off its balance sheet to fund the rail network; freight road operators are free riders on a road network that is financed by the fiscus which supplements user fees that are largely paid by private motorists. Therefore regulating rail without regulating the freight road mode will undermine the already fragile underperforming freight rail network. As pointed out by van der Mecht (2005), there is a general consensus in the road versus rail literature debate about the competitive bias against rail brought about by the cross subsidy from private road users to the trucking business (van der Mecht, 2005: 1027). Consequently, more freight will migrate to the road mode.

It is for this reason that DPE and TFR oppose the idea of an interrim regulator within a context of a policy gap environment that does not level the playing field between the two modes. DPE and TFR have proposed a policy process that they believe must begin with a land freight white paper policy. A key provision in the policy is a framework to ensure competitive neutrality between the freight road and rail modes; the policy is then followed by an Act that establishes the Single Transport Economic Regulator. National Treasury is of the view that competitive neutrality could be obtained along with an interim regulatory process through an initiative that ensures that the trucking business pays its due by charging trucks a rand per km fare as is done in Sweden. Germany and Australia also follow similar pay as you go system. Funds obtained from the fare are then ring fenced and channelled towards freight rail. Interviews do reveal that Transnet has a general resistance towards receiving state injections due to the loss in autonomy such injections are associated with, therefore this position brings into question Transnet's commitment to resolving policy issues that are withholding the reform process from fully materialising.

An area where there appears to be greater alignment is the branchline strategy. In 2010, DPE approved Transnet's branchline strategy wherein branchlines would be concessioned out to private players. According to Rustomjee (2013), the DoT also made a similar proposal in 2010. The position positions were affirmed in 2011 with feasibility tests conducted by Transnet on grain related potential concessions. However some within Treasury question the move by TFR to concession an area where there is market failure (branchlines) and thus in need of support while the area which is highly competitive by international standards (orex and coalex lines) is kept in house.

The policy debates about the envisioned market structure highlight differences in opinion about TFR's social obligation and related to that the extent of its financial autonomy. Should it focus on areas where there are market failures as is the case in the range of GFB commodities or should it continue under the present market structure. A focus on market failures implies that TFR's prized autonomy can no longer be sheilded by its cash generating coal and iron ore rail lines because it would have to tap into some form of state financing which would open it up to external question and direction. The micro analysis has shown that TFR's retention of its autonomy without any forms of regulation have induced scenarios in which existing vested interests have become the gate keepers of the network and in some instances have been aided by the conflicted shareholder. The presence of an interim regulator would aid in eliminating issues of confllct of interest and in reducing the information asymetries about TFR's operation efficiencies, investment choices and pricing policies that currently exist and prevent informed policy making decisions required to improve the performance of the GFB. To avoid putting the fragile network under further stress, the establishment of an interim regulator should be accompanied by measures that create competitive neutrality between the road and rail modes. While this study has not explored all such measures, some parties have suggested the levying of a road-user tariff on road freight. These measures need not await the conclusion of a 10 year policy reform process, given that the current deals being struck and investments being made may make it increasingly difficult for a regulator to address if they are found to be biased against a range of GFB commodities.

8. POTENTIAL ROLE FOR ECONOMIC REGULATOR

The presence of a regulator accompanied by a mode equalising financing package for rail is critical for clearing up the information asymetries and dealing with the network inefficiencies that currently exist and are undermining the performance of the GFB market segment. This section will provide recommendations about the role that the regulator can play and will also attempt to address some of the information requirements that a regulator will require to assess TFR's pricing policy.

An economic regulator is required to resolve the pricing, access, service and investment disputes constraining GFB's volumes. Given the monopolistic structure of freight rail the regulatory regime should be based on the following key pillars:

- **Transparent dissemination of freight rail cost of supply and tariff information:** A pre-requisite for a rail freight regulator is to have detailed information on the cost of supply of the respective rail services as well as the differential tariffs being charged to different users. Such information is normally disseminated publically.
- ***Proactive performance monitoring:*** performance reviews are vital to ascertaining proactively the operational and service inefficiencies that may be undermining the performance of the GFB segment. The current indicators constructed by the shareholder for the GFB, while useful, are at a highly aggregated level that does not allow for an assessment of the performance of the individual commodity lines. Therefore there is a need for the regulator to design indicators at a micro level so that it can detect instances where there is need for further investigation. Given the vastness of the commodities within the GFB, the regulator could start off by designing indicators for those commodities deemed strategic by industrial, economic or agricultural policy.
- ***Regulated arbitrage model:*** this model encourages commercial decisions over pricing, access, services and new investment however within set out parameters

determined by the regulator to ensure that the customer and the service provider are not exploited. An informed decision will have to be made about whether to use reference pricing (which will encounter the problem of identifying a comparable basket given uniqueness of SAs network characteristics) or that negotiations should take place within a regulated maximum and minimum bound rate.

- ***Burden of proof:*** complainant has burden of proof based on the fulfillment of certain tests determined by the regulator.
- ***Access rules:*** these must be designed by the regulator such that TFR is obliged to negotiate access with the customer from the basis of having conducted a capacity assessment. Negotiations should take place within a limited period determined by the regulator to ensure that negotiations do not hold up access onto the network by other customers.

Illustrated in table 9 is an inexhaustive list of some of the information that a regulator would require to assess TFR's pricing policy. Historic and projected volume and historic revenue per tonne km data are critical as they in part determine the discounts and the service plan the commodity is likely to receive. Specifying the volume data by corridor and commodity is also important as the corridor's operating costs are differentiated by the underlying network technology specifications that are used to transport the commodity in question. Therefore the regulator would need a list of the underlying network technology specification across the corridors in order to calculate the commodities operating expenses. The regulator would also require information on the service plan for each commodity and information on the number of rolling stock available for each commodity to have a sense of available capacity.

Table 9. Key information required By Regulator for Pricing Assessment

	Information Requirement
Expenses - **Operating costs**	Technology characteristics: axle load, gradient, train control, traction, electrification status, per corridor, loop legnth , route length per corridor, etc. Number and of rolling stock
Volume	Volume projection figures by commodity and corridor Historical volume time series tonne per km Service plan by commodity
Financial Stability	Annual Reports
Cross subsidy	Revenue per tonne km by commodity

Source: Authors construction

The analysis shows that there is a need to fast track the reform process through the establishment of an interim regulator in the short term so that the long term reform process does not subject the regulator to a regime of possible 'anti-competitive' long term contracts that hold the network to ransom in the future. However a critical first step is to ensure that there are mechanisms in place for greater competitive neutrality between the two modes. Therefore further investigation is required to identify the optimal competitive neutrality mechanism to ensure the viability of both modes, i.e. road and rail. Moreover these funds can be ring fenced towards TFR operations deemed as critical for economic and industrial policy (e.g. containers and agricultural products) that are currently neglected due to the extent of the

market failures. Other important steps are to review the current regime of long term contracts and third party logistics to ascertain whether or not they are anti-competitive.

9. CONCLUSION

The aim of the paper was to investigate the contribution of the regulatory framework to the sluggishness in GFB's volumes by analysing TFR's investment decisions. The macro-level analysis revealed GFB's volume underperformance is due to the current macro-level performance based regulatory framework that has encouraged a constrained investment performance. This constrained investment environment relies on a tariff based investment strategy that is augmented by raising capital from the market. This triggers a vicious cycle that limits volume improvement from the GFB segment given the current poor levels of service. The effect of the strategy on rail's tariffs is such that they have exceeded road's average tariffs in recent years, which is contradictory to received wisdom about rail's relative cost competitiveness. TFR as a consequence of the regulatory regime, has had to rationalise investments in high revenue earning key corridors and commodities. Moreover, investments have focused on sustaining the current customer base rather than growing and diversifying it as the investment is not large enough to radically restructure the inefficiencies in the underlying network. Therefore the performance based regulatory regime favours private rate of return rather than a social rate of return.

The paper also demonstrated that the regulatory regimes current focus on macro-level performance rather than a micro level sectoral level. This has created a power vacuum that has the potential to be exploited by certain vested interests that have always benefited from freight provision and may continue to do so unduly at the expense of other general freight users. This was shown in the investment dispute between coal miners and TFR and with the shareholder's involvement in the automotive assembly while the labour intensive automotive component segment and citrus have not been catered to. Moreover, it was revealed through the citrus and auto's case, that containers, which are likely to attract value added goods, are not as well prioritised as the constrained investment environment cannot contend with their complexities.

There is an acknowledgement in policy circles that regulatory reform is required in order to deal with TFR's pricing, access, and service issues. However this has proven difficult due to debates about the market structure and processes that should be followed to ensure that the rail network is not left even more fragile. Therefore there is a need for oversight of the reform process possibly lead by the Presidency to iron out these issues in order to expedite and resolve key process: the DoT Green Paper on Rail, the Rail Act and the STER Bill. This research work argues that an interim solution that appeases all parties can be brokered. The interim process should include the establishment of an interrim regulator. Accompanying its establishment is the recommendation that a financing package that enhances competitive neutrality between rail and road be brokered. However, since this research focused mainly on the current regulatory framework for freight rail and its impact on pricing and investment, there is a need for further research on the current regulatory framework for road freight in order to devise a financing package that ensures the viability of both modes. Moreover, the interrim regulator would also have to request TFR to fill in the missing information on tariff setting discussed in table 4.

Citrus is only one of many geographically specific sectors served by branchlines that have been affected by pressure on Transnet's balance sheet. The current resolution established by outcome 6 of the Transport cluster delivery agreement is to mobilise private and SOE funds

for branchline revitalisation. The practice thus far however has been for Transnet to fund its main lines off its balance sheet whilest branchlines fall into desrepair. This is a lost opportunity to create rural employment. DoT's Transport policy is to finance branchlines through commercialisation or concessioning. However it is clear from the discussion in section 7 that there is little movement in this regard. There needs to be a specific short term process around targeted pilot branch line revitalisation involving a range of organised user groups like citrus. Moreover, the case also highlighted the need for further research in TFR's relationships with its contracted logistics companies.

However, the urgent need to conclude the coalex dispute may require that an inter-departmental agreement be reached on the policy criteria against which contracts should be judged. The interdepartmental agreement should be reached through the establishment of an interdepartment oversight group that includes DPE, Transnet and DoT to assesses all long term contracts. The criteria to which all long term contracts must be assessed should include:

- Thorough cost of supply analysis
- Transparency on any cross-subsidy between customers
- An assessment of any tariff related preference or an inside lane on TFR's resource allocation (via the ministers committee) being given to specific sectors such as the auto assembly.

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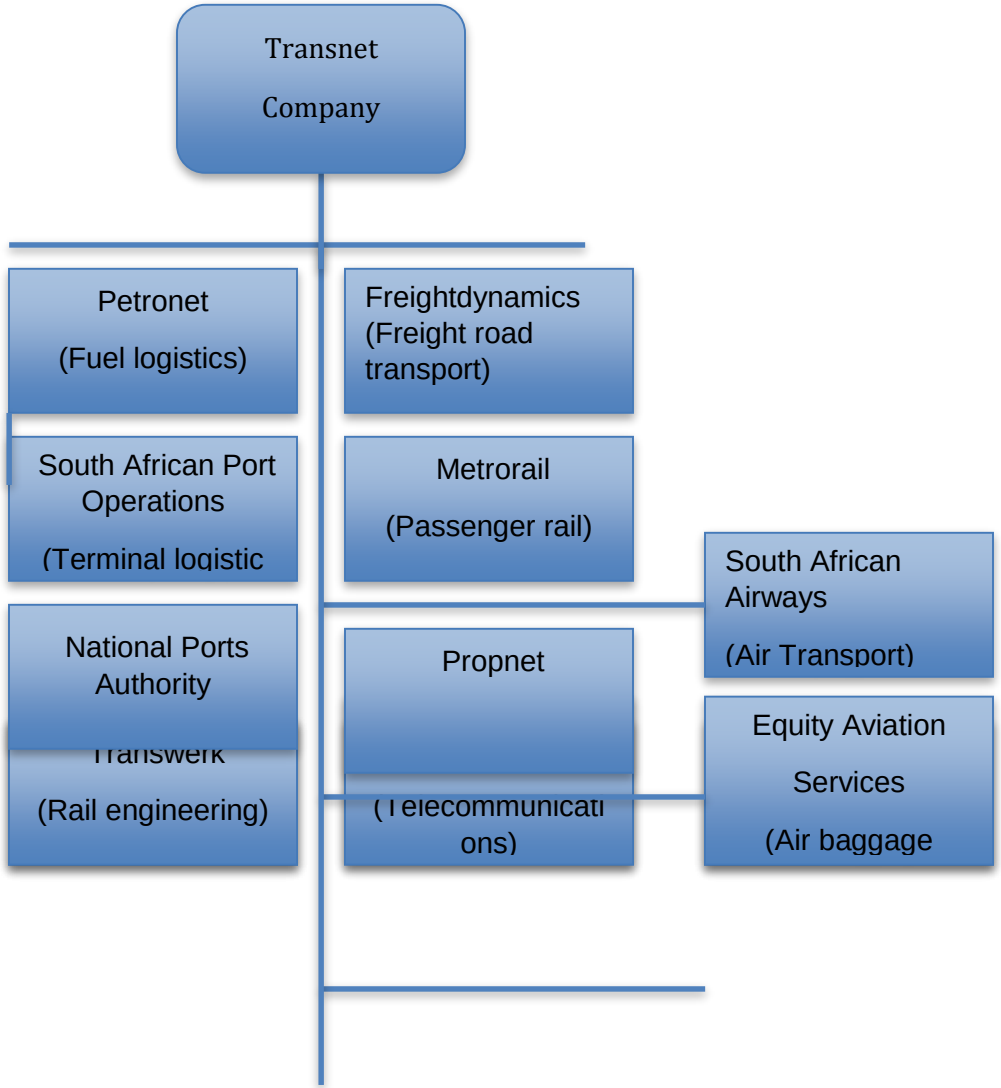
APPENDICES

Appendix A

Figure 5. Effect of Transnet Restructuring on Organisation Structure



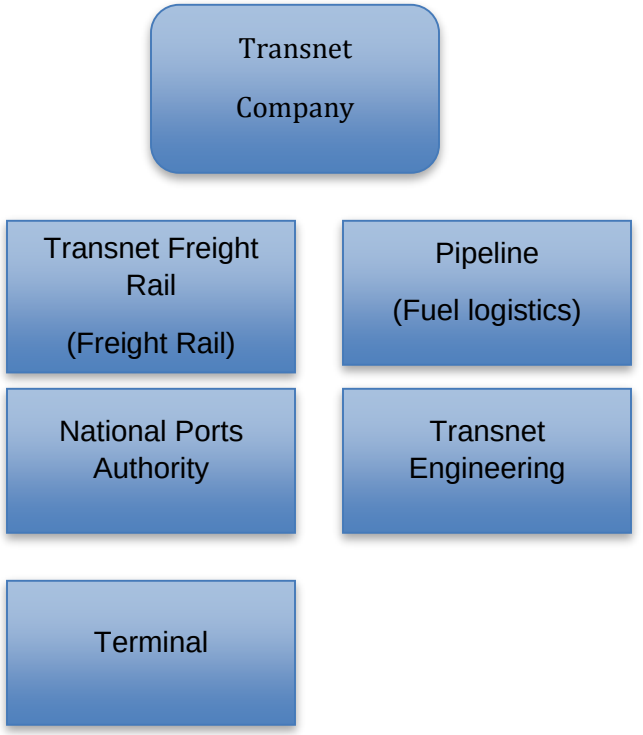
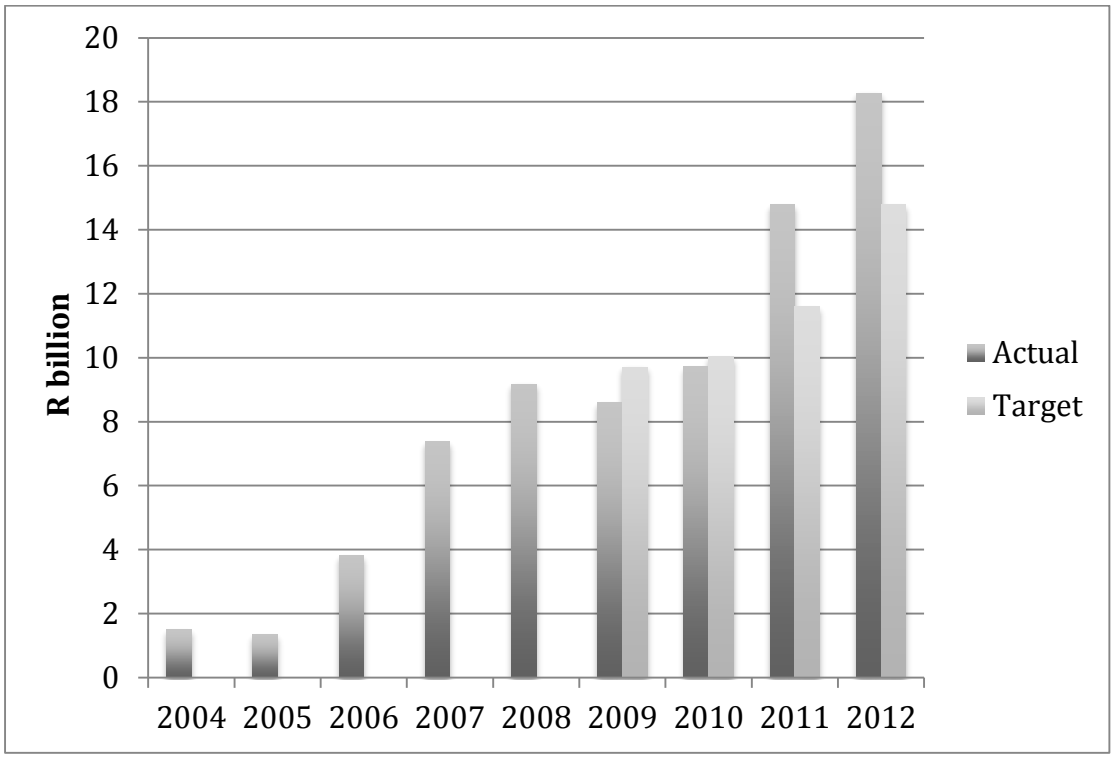
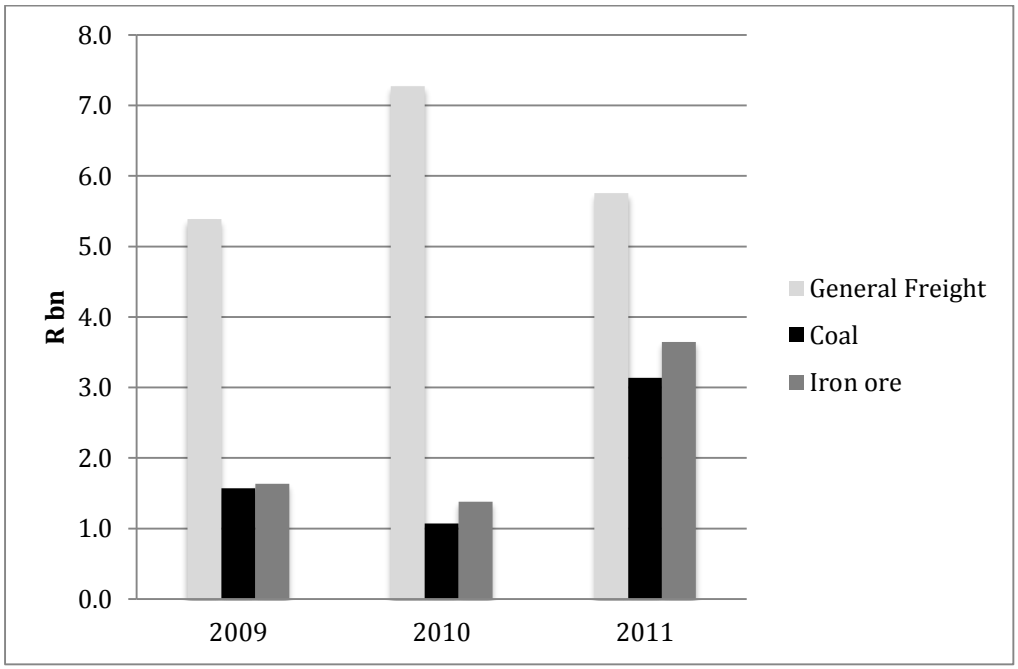


Figure 5. Actual and Target Investments in TFR, 2004-2012



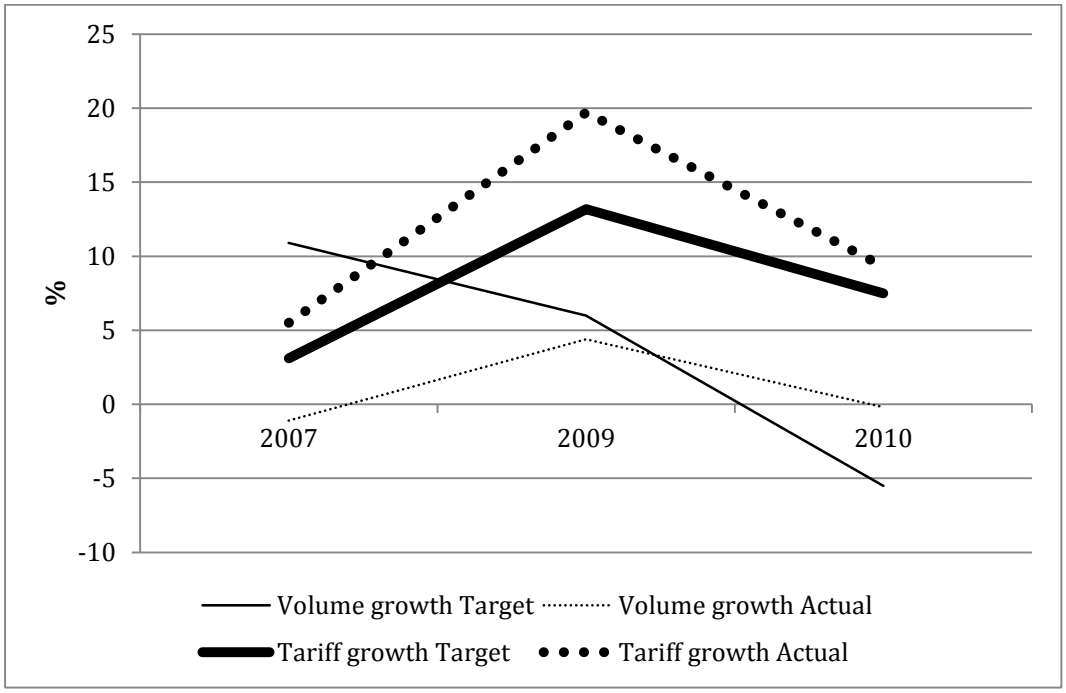
Source: Transnet Annual Reports (2004-2012)

Figure 6. Actual Investments



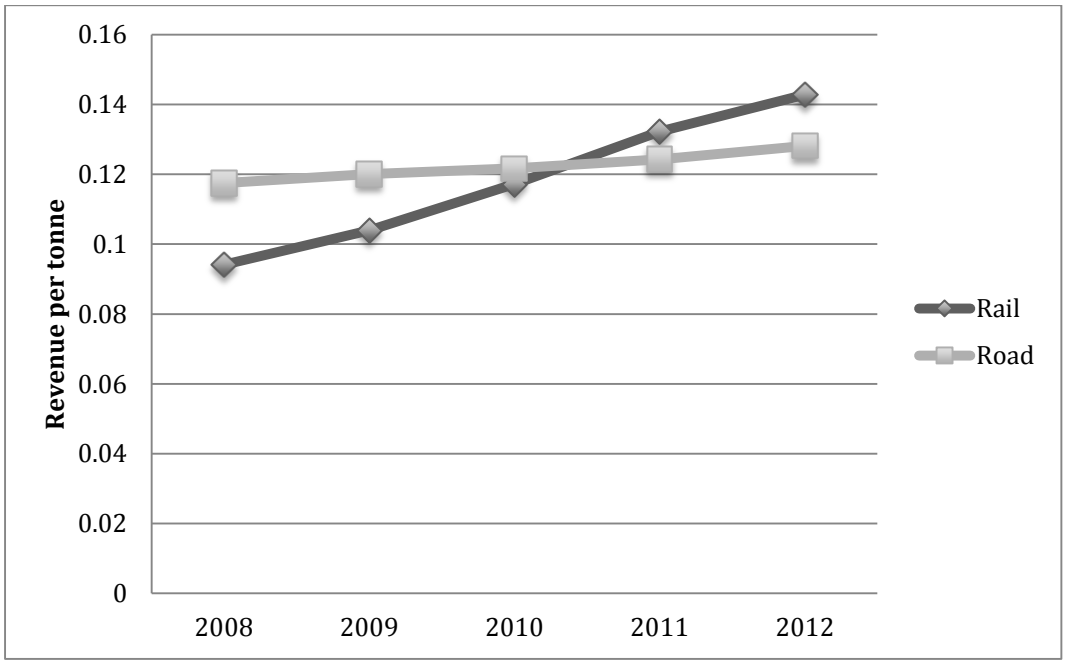
Source: Transnet Annual Reports (2009-2011)

Figure 7. Actual and Target Contribution of Price and Volume Increase to Revenue Increase



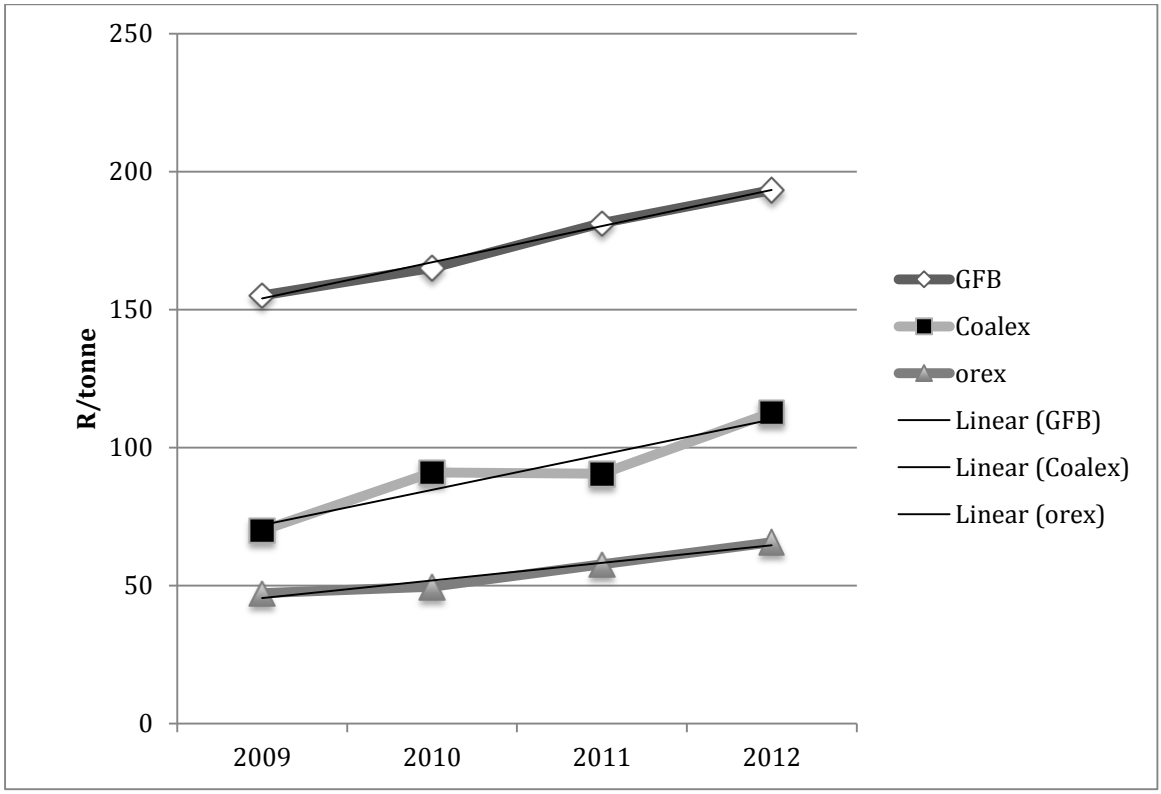
Source: Transnet Annual Reports (2007,2009 and 2010)

Figure 8. Average Revenue Per tonne for Freight Rail and Road, 2008-2012



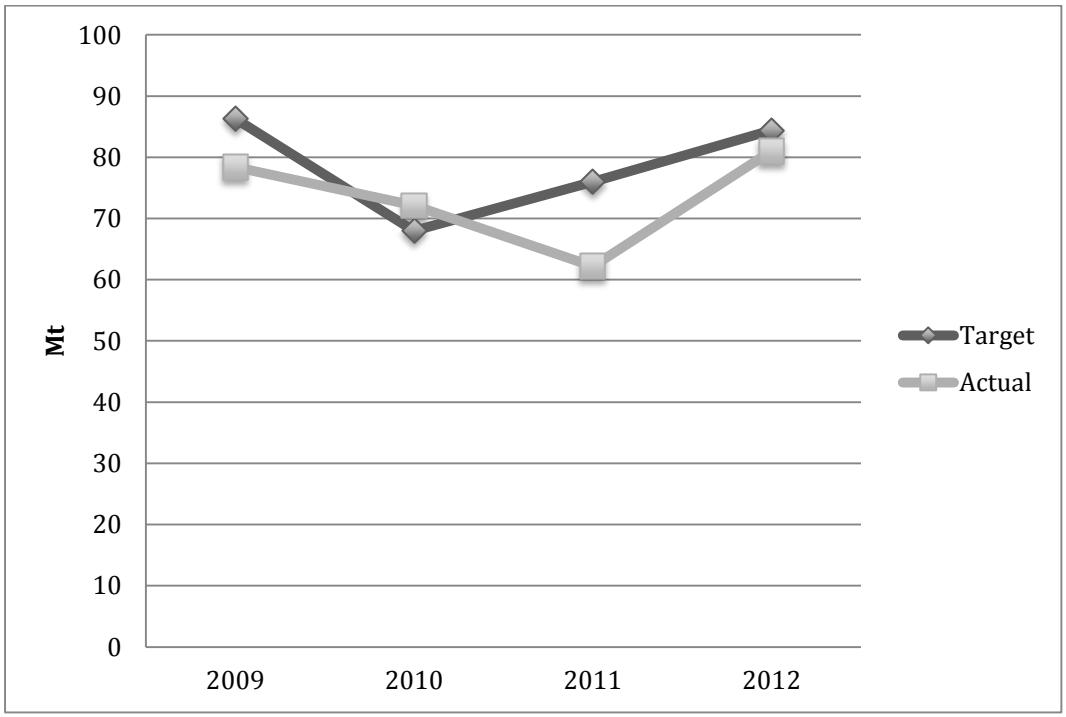
Source: StatsSA Land Freight Monthly Survey

Figure 9. Average Revenue Per tonne for GFB, Coalex and Orex, 2008-2012



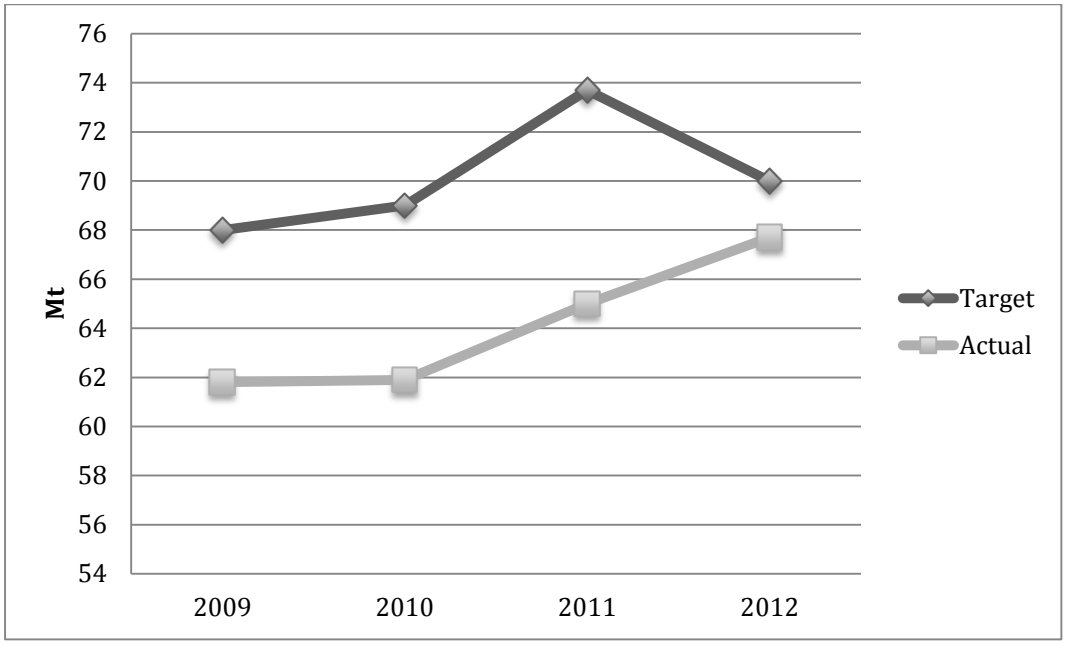
Source: Transnet Annual Reports (2009-2012)

Figure 10. Actual and Target GFB Volumes, 2009-2012



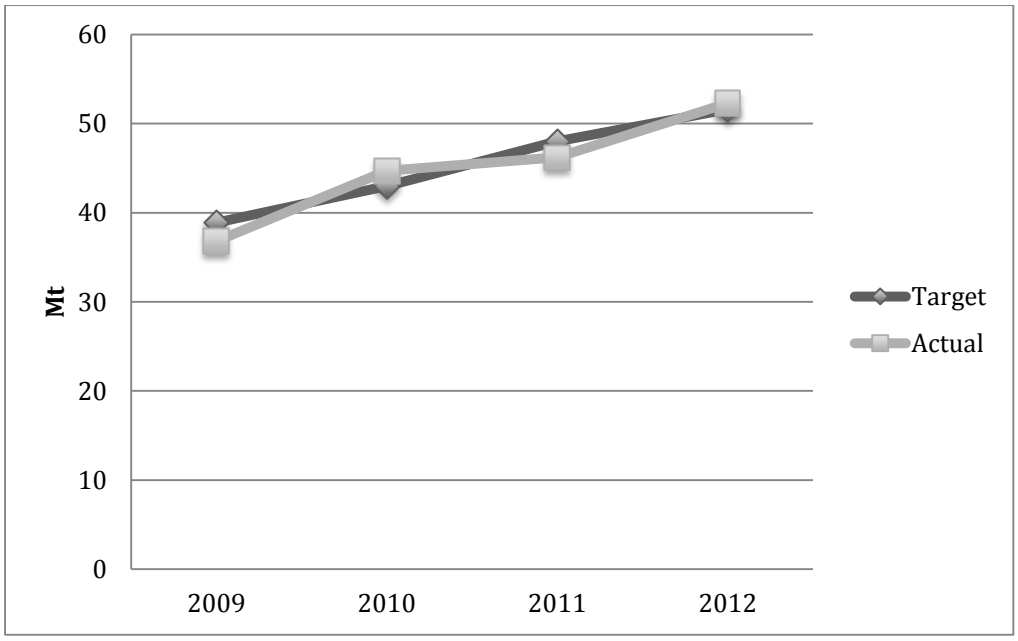
Source: Transnet Annual Reports (2009-2012)

Figure 11. Coalex actual and target volumes, 2009-2012



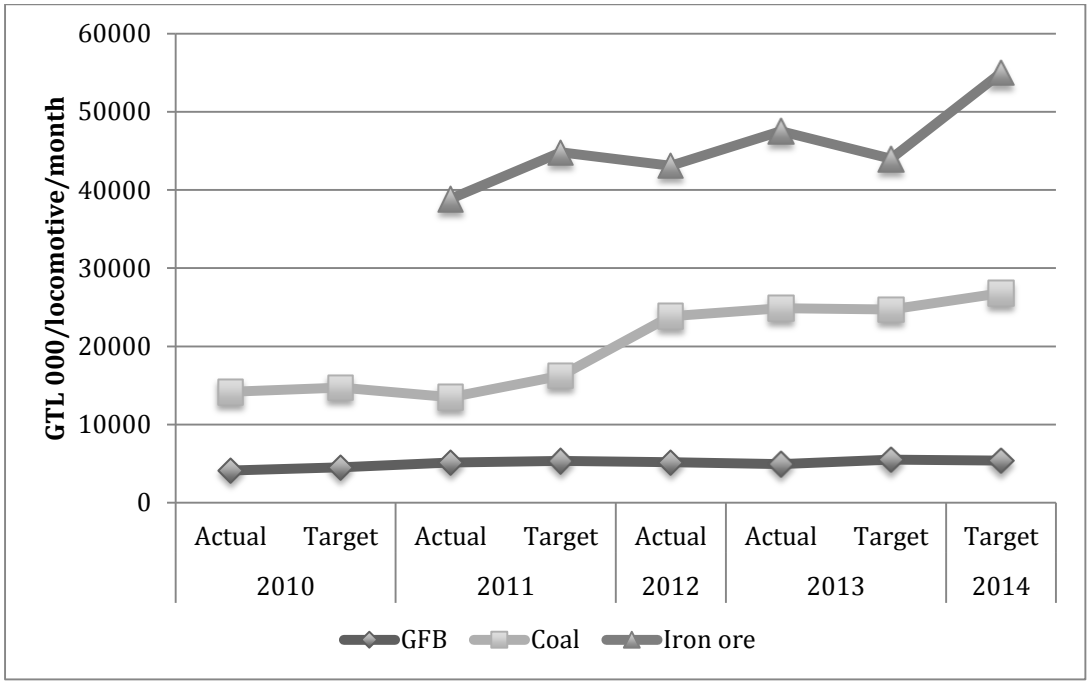
Source: Transnet Annual Reports (2009-2012)

Figure 12. Export Iron Ore Volumes, 2009-2012



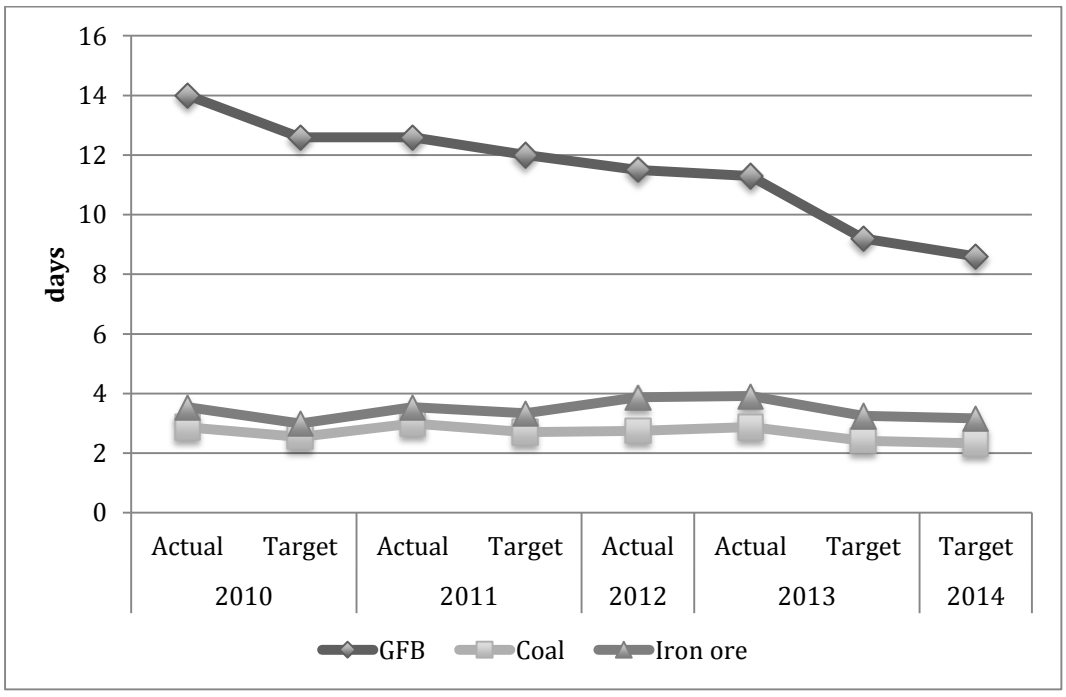
Source: Transnet Annual Reports (2009-2012)

Figure 13. Actual and Target Locomotive Productivity, 2010-2014



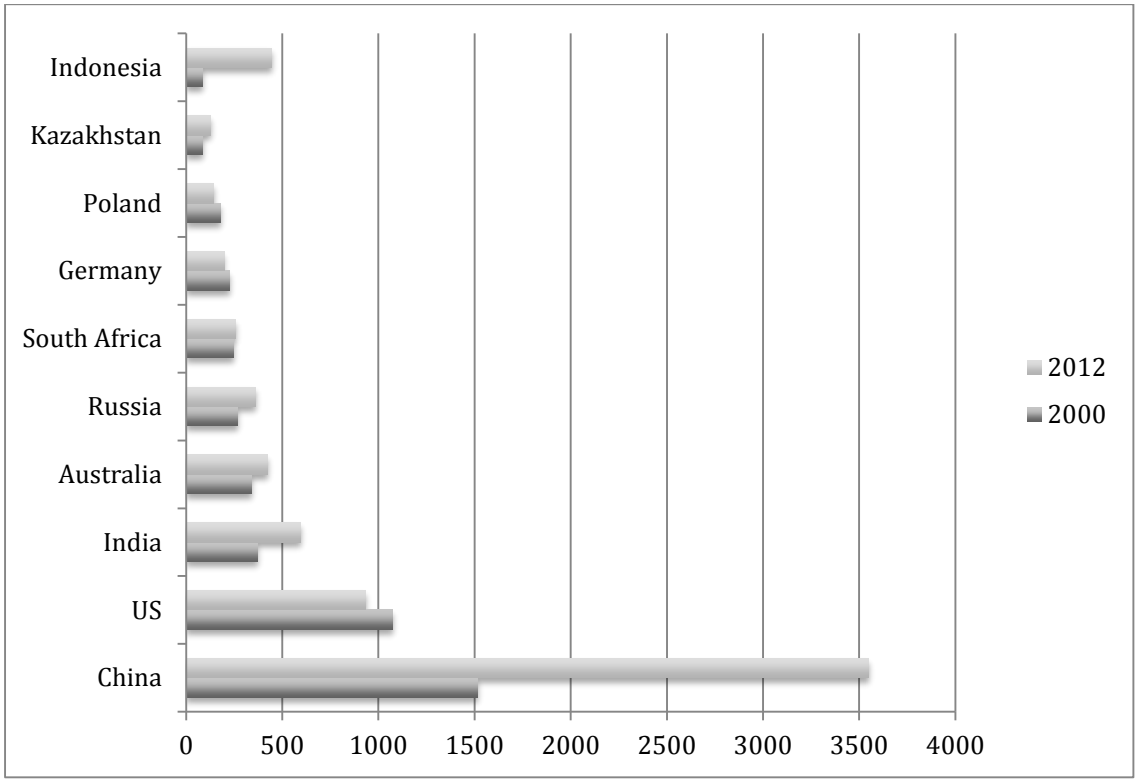
Source: Transnet Annual Reports (2010-2013)

Figure 14. Actual and Target Wagon turn around time, 2010-2014



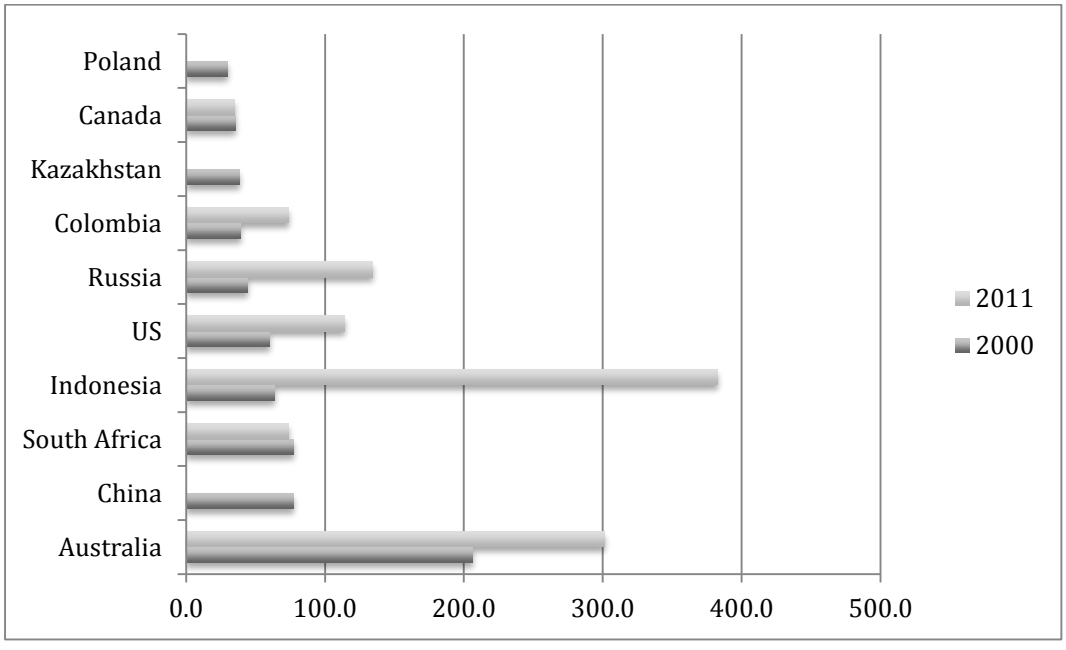
Source: Transnet Annual Reports (2010-2013)

Figure 15. Top Country Coal Producers, 2000 and 2012



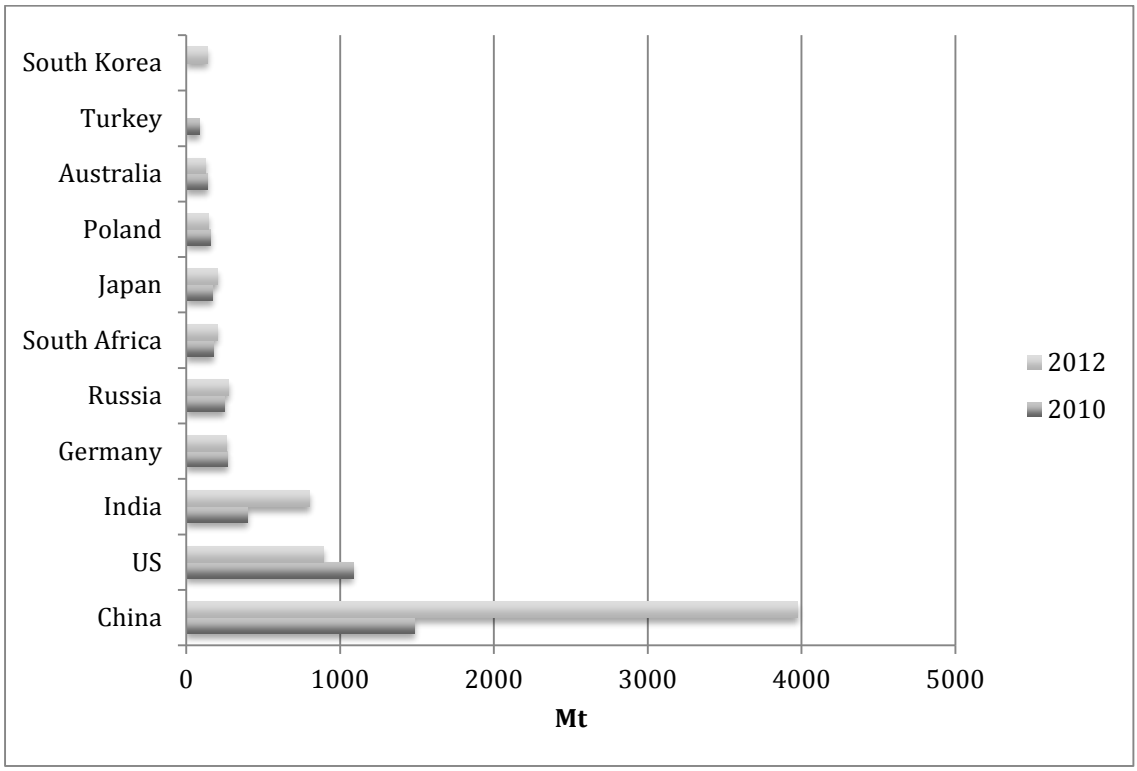
Source: Department of Mineral Resources (DMR) South African Minerals Industry (SAMI)

Figure 16. Top Exporting Countries



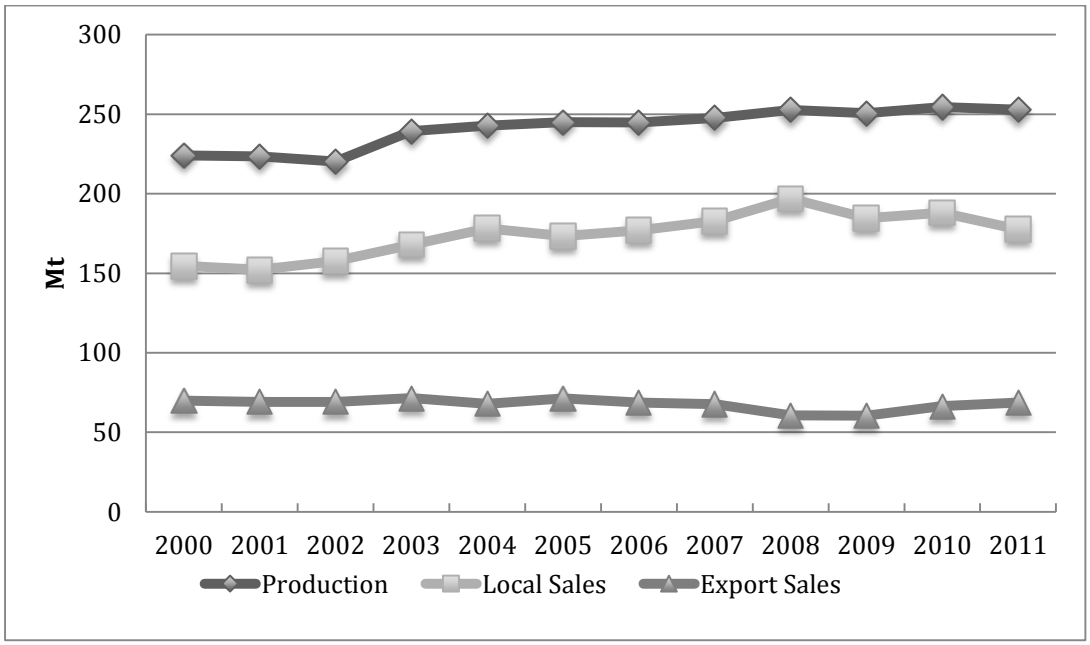
Source: DMR SAMI (2011)

Figure 17. Leading Consumer Countries



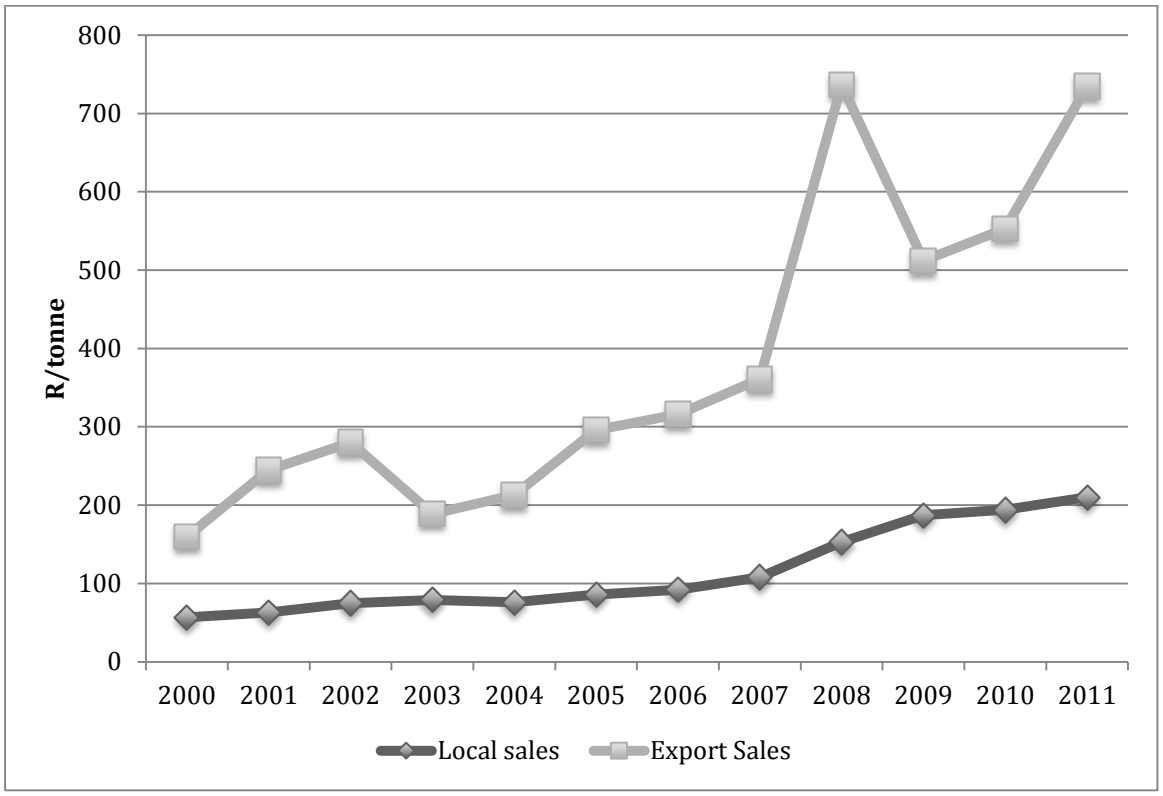
Source: DMR SAMI (2011)

Figure 18. South African Total Production, Local Sales and Export sales



Source: DMR SAMI (2011)

Figure 19. Local and Export Price of Coal, 2000 - 2010



Source: DMR SAMI (2011)

Figure 20. Logistics System for Coal Exports

Source:

Table 10. Performance of Auto Assembly Sector

Production (2012)	12 year CAGR (2010-12)
2,200,983 t	3.4
Value Added (2012)	12 year CAGR (2010-12)
R 6.9 bn	12.4
Exports	12 year CAGR (2010-12)
1,276,099 t	6.2

Source: Quantec (2014)

Table 11. Performance of Citrus Sector

	1995	2012
Capital expenditure by OEM	R 847 mn	R 4.7 bn
Export value	R 4.2 bn	R 86.9 bn
Total vehicle exported (units)	15,764	277,893
Automotive industry contribution to GDP	6.5%	7%
Total units produced	389,392	539,538
Contribution to global production		1%

Source: NAAMSA (2013)

Table 12. SOC Shareholder, Transnet, Eskom and Auto Assembly Sector Arrangement

Transnet	Eskom
Price competitiveness of rail and ports	Price competitiveness of electricity
Reliability of rail and port services	Reliability of electricity supply
Availability of rail and port services	Availability of electricity capacity
Efficiency of rail and port services	Responsiveness of Eskom to company and industry needs
Supply Chain operational and tactical transparency	Proposals around how the logistics service could be improved.
Responsiveness of Transnet to company and industry needs	
Proposals around how the logistics services could be improved	

Source: NAAMSA (2014)