FREIGHT RAIL ECONOMIC REGULATION AND THE VERTICAL SEPARATION/OPEN ACCESS DISCUSSION IN SOUTH AFRICA

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ABSTRACT

The issues surrounding vertical separation, privatisation and economic regulation have recently resurfaced in South Africa around discussions to create a rail economic regulator (RER) (Radebe, 2008). In particular, a framework was proposed that has an overarching objective of more efficient and effective rail services. To achieve this, rail economic regulation should be benchmarked internationally and key principles for a regulator should be developed.

Recent events such as reform in rail passenger transport, the development of the Gautrain and a new approach for branch lines have provided impetus for new proposals for more overarching rail reforms. These reforms propose structural changes to achieve competitiveness on, private-sector investment and quality improvements which will provide transparency and eliminate cross-subsidisation.

Although there are various options for reform (in particular, vertical integration with third-party access, or horizontal separation or vertical separation) vertical separation in freight rail is specifically highlighted as the vision put forward by the National Freight Logistics Strategy (NFLS).

Following the deregulation of surface transport services around two to three decades ago, modal competition was encouraged in many countries. The primary objectives were to enable free-market principles, encourage efficiency and effectiveness in surface transport and allow rail services to become profitable – often to prepare the rail operators for privatisation. Although the approach was generally sound, some specific problems surfaced, indicating that not all the above-mentioned objectives were reached. On the one hand, certain bulk freight transport services in low-cost, long-haul markets were ‘captured’ by rail because of its nature. On the other hand, however, traffic that did switch caused structural

inefficiencies on a macro-economic scale. Initially, freight owners on a micro-consignment level experienced better service levels owing to increased competition. The loss of economies of scale on the rail network, however, caused higher rail costs and tariffs, with severe long-term consequences on a national level. This was further exacerbated by the inappropriate allocation of externalities. Once the effect of these issues on national competitiveness became evident, governments were motivated to develop strategies to revitalise rail as a preferred mode for long-distance transport with the key outcome of lowering the total freight cost of the economy.

South Africa's specific history and circumstances clearly indicate that the role of an economic regulator should be that of a transport economic regulator. A blind belief that competition in rail will achieve efficient and effective rail services is unproven, and such services could be costly and is complex. If the historic imbalances are addressed, reinvestment in rail maintained and the turnaround strategy supported, efficiency and effectiveness could be engineered in a much shorter time while protecting and promoting South Africa's competitiveness. A transport economic regulator could assist in this process by levelling the playing field, engineering transparency and through performance management.

INTRODUCTION

The issues surrounding vertical separation, privatisation and economic regulation have recently resurfaced in South Africa around discussions to create a rail economic regulator. Transnet, as a large infrastructure owner, the primary rail operator in South Africa and a commercialised public enterprise, is an important stakeholder in this process and should take a specific position on these developments as a departure point for possible future discussions with government and other stakeholders about rail economic regulation.

In particular, a framework was proposed that has an overarching objective of more efficient and effective rail services. To achieve this, rail economic regulation should be benchmarked internationally and key principles for an RER should be developed (Khuthele Projects, 2007, p. 1). The further objectives and governance model for an RER were also defined and the strategic plan of the Department of Transport (DoT) is cited, i.e. that the growth, operation and optimisation of the rail system should be 'overseen' (op. cit., p. 2).

Recent events, such as reform in rail passenger transport, the development of the Gautrain and a new approach for branch lines provided impetus to new proposals for more overarching rail reforms. These reforms propose structural changes to achieve competition, private-sector investment and quality improvements which will provide transparency and eliminate cross-subsidisation (op. cit., pp. 2–5).

Freight transport plays an important strategic role and it is believed that the current framework allows for 'monopolistic tendencies, fiscal neglect and poor demand planning' (op. cit., p. 8) Even though various options for reform exist (most importantly, vertical integration with third-party access or even horizontal separation or vertical separation) vertical

separation in freight rail is specifically highlighted as the vision put forward by the NFLS (op. cit., pp. 31–32). It is envisaged that in the short to medium term, third-party access will be engineered (op. cit., p. 37), but possibly assumed that the long-term vision would be vertical separation. A report by Khuthele Projects entitled 'Interim report – access regulation – rail economic regulator' is referred to. Interestingly, the copy of the report that was made available recommends that 'the restructuring model should not have a high degree of vertical separation and operators should control both train operations and infrastructure' (p. 25). But this recommendation in the document that was made available has a review comment (the only one in the document), which says 'discuss please'.

GLOBAL PRACTICE

The Khuthele Projects report specifically mentions that many countries are in the process of rail reform and that the process is complex (Khuthele Projects, 2007, p. 11; pp. 19–20). A more specific view of the context and history of global practice are required.

History

Following deregulation of surface transport services in many countries around two to three decades ago, modal competition was encouraged. The primary objectives were to enable free market principles, to encourage efficiency and effectiveness in surface transport and to allow rail services to become profitable, often to prepare the rail operators for privatisation. Although the approach was generally sound, some specific problems surfaced, indicating that not all the above-mentioned objectives were reached. On the one hand, certain bulk freight transport services in low-cost, long-haul markets were 'captured' by rail because of its nature, but on the other hand traffic that did switch caused structural inefficiencies (often described as the 'tragedy of the commons' phenomenon) on a macro-economic scale. Initially, freight owners on a micro-consignment level experienced better service levels owing to increased competition. The loss of economies of scale on the rail network, however, caused higher rail costs and tariffs, with severe long-term consequences on a national level. This was further exacerbated by the inappropriate allocation of externalities. Once the effect of these events on national competitiveness became evident, governments were motivated to develop strategies to revitalise rail as a preferred mode for long-distance transport with the key outcome of lowering the total freight cost of the economy.

Returning to the free market principle, vertical separation and open access were seen as apparent obvious solutions, but on closer scrutiny a different truth emerged. This approach is not unique to rail services and could be applied to a range of utilities, such as telecommunications, postal services, energy and water supply. The approach and expected benefits for each utility, however, will differ. Pittman (2005) specifically refers to the rail sector and compares it with other utilities when he says that 'one of the specific lessons of the experience to date is that the freight railways sector may not be a very promising sector for

vertical separation'. He continues to say that 'analysts throughout the world are coming to understand *ex post* much better than they did *ex ante* that there are a number of characteristics of the freight railways sector that do not seem to fit well with the assumptions and requirements of the vertical separation model' (Pittman, 2005, p. 182).

In rail services the specific benefits that were expected to follow from vertical separation and/or open access were to encourage competition (as in Australia), the facilitation of international services (as in Europe) and even to put different modes on an equal footing (as in Scandinavia) (Gomez-Ibanez and De Rus, 2006, p. 5). A focus on specific tasks by the rail infrastructure company, which would lead to more efficient and effective maintenance, is also sometimes mentioned, but specific failures in the United Kingdom and an analysis of other case studies has proven that when 'specializing in mainly maintaining infrastructure, the maintenance cost is no different from the costs of integrated systems' (Mizutani and Shoji, 2004, p. 262).

Of these benefits, only competition could be an issue in South Africa because a very large percentage of current and medium-term future traffic is considered domestic and because the road mode already enjoys significant statutory benefits over rail.

Another important consideration for rail reform globally was the funding required to rejuvenate rail. Various rail liberalisation options were considered to specifically solve this problem. Some practices are summarised in Table 1.

Table 1 – Rail funding practices

Practice	**Issue**	**Country**
The state offloads the rail reform problem to a development bank	▪ Finding the best agency to manage a concessioning process	Brazil: BNDES
Provide a state-owned recapitalisation catch net for failing concessions	▪ Management of the logistics network impacts on the economy when a concession fails	Brazil: BNDES
• Special back-to-back arrangements with BNDES for intermediate lending • Customers buy new rolling stock on their balance sheets and TOCs and buy it back through tariff discounts	▪ State-owned assets are not on concessionaire's balance sheet to gear against	Brazil: ALL
Rolling-stock finance SOE	▪ Finding attractive specialised funding for rolling-stock modernisation	India: IRFC

A number of funding mechanisms have been pursued by railways worldwide. Table 2 indicates the funding approaches for networks, rolling stock and train operations that have evolved during rail reform and transformation. This also implies that there is no universal remedy for addressing the funding issue.

Table 2 – Funding mechanisms

Case	Network	Rolling stock	Train operations
USA	Private TOCs	Private TOCs	Private TOCs
Brazil	• BNDES (old) • Private TOCs (new)	• BNDES (old) • Private TOCs (new)	Private TOCs
EU	Governments	TOC	Private/SoE TOCs
Australia	AusLink and state government	Private / SoE TOCs	Private/SoE TOCs
China	MoR/provincial government	MoR/JV	CR/JVs
India	MoR	IRFC	IR/PPP's

Notes: TOC = train-operating company; BNDES = ; MoR = Ministry of Railways; SoE = ; JV = ; CR = China Railways, IRFC = Indian Railway Finance Corporation; IR = ; PPP =

Table 3 summarises the funding issues in terms of state or private ownership which highlight the rail reform path taken by various railways worldwide.

Table 2 – Funding issues

Rail reform models		USA	Brazil	Australia	EU	India	China
Vertically Integrated				Hybrid state- (QR) and privately owned	NA	State-owned	State-owned
Competitive access		Privately owned and operated	Concessions	Rarely			
Vertically separated	**Train operators**	NA	NA	Hybrid state- and privately owned	Hybrid state and privately owned	NA	NA
	Network owner	NA	NA	Federal-owned (ARTC)	Hybrid state and privately owned	NA	NA
	Terminals	NA	NA	Hybrid state- and privately owned	Joint ownership – LSPs and railways	NA	NA
New expansion projects		TOC's balance sheet	Concessionaire's balance sheet	ARTC leads interstate rail; rest private; IPO (QR)		PPP	Joint ventures
Regulation		Deregulated		Seven state regulators; national regulator on the cards	EU directive; country-level regulators	Self-regulated	Self-regulated

Notes: QR = ; ARTC = ; IPO = ; LSP = ; PPP =

The analysis of case references does not build a clear case for any specific form or model of 'rail liberalisation', such as vertical separation or integration, open access or a combination of these. There is no clear evidence that any of these forms were more successful than others, as many research projects over the last decade have established. Specific forms were sometimes necessary for extrinsic reasons (such as open access in the EU due to its political structure; concessioning in Brazil due to the absence of funds for further investment; or interstate integration in Australia). There were successes and failures, not because of the specific form, but because of adherence, or lack of it, to three basic principles:

- Adherence to sound macro-economic principles (South African rail policy objectives are clear and logical: to support exports and mobility, shift freight traffic from road to rail, reduce the cost of logistics and improve the competitiveness of the country.)
- Adherence to sound business principles (appropriate investment criteria and investment vehicles, cost management, processes and practices to adapt to the business environment, improvements in productivity and efficiency and *not necessarily a pure profit motive*).
- Clear and commonly shared objectives of what is required with the rail-reform activity (not reform for the sake of it, but in order to contribute to some national objective). In South Africa's case, growth of the economy, equitable distribution of wealth and the protection of society.

Status quo

The different emphases placed on proposed vertical separation/open access processes, as well as the motives behind them, led to the rise of many different models for what was to be termed 'rail reform'. These models can, however, be summarised as the British and Brussels approaches (Diaconu and Pittman, 2006, p. 2). The British model requires complete vertical separation, whereas the Brussels model maintains vertical integration, although third-party operators are allowed to use the vertically integrated operator's infrastructure (sometimes called the 'third-party access' model). A further and separate dimension to these issues is the extent to which rail operators are privatised. (The Khuthele document is clear that third-party access, i.e. the Brussels model, should be engineered. The British model is tabled as the vision of the National Freight Logistics Strategy, but it is not, as such, supported in detail in the final document, i.e. the issue is left somewhat open.)

Although the concepts of vertical separation and open access have been in existence for more than a decade, success could at best be described as limited. By 2007, 97% of rail traffic was still handled by vertically integrated railways (Amos, 2007, p. 3).

Privatisation, especially in the case of freight railways, is, however, more successful (only 2% of passenger-kilometres but 40% of freight ton-kilometres are handled by private operators). This emphasises the disconnection between the concepts of privatisation and vertical separation, i.e. the one is not a prerequisite for, or a necessary driver of, the other.

Failures and difficulties of vertical separation

Many reasons for failures or implementation difficulties are cited by researchers and experts in the logistics discipline, and are synthesised in this section. The reasons include complexity, high costs of execution, loss of economies of scale, safety risks and information asymmetries.[1]

Paradoxically, the problems associated with information asymmetries during vertical separation and the processes that successful address them lead to close relationships between interested parties. The mooted advantages of vertical separation are then negated by the fact that an industry with a few highly specialised players and highly integrated operations will require these relationships to be successful (Sanchez, 2001, p. 7). This inevitably leads to 'co-operation, quasi-reintegration, [which] limit the role of market forces contrary to what was apparently planned in the first years of the railway reform' (Bouf, 2005, p. 11).

According to Pittman, 'common sense and econometric analysis both suggest that the application of the reformers' "default option'' of vertical separation in the freight railways sector may impose high costs on the system in their destruction of economies of vertical integration; thus arguments for the adoption of this option would seem to require the demonstration of high levels of corresponding benefits' (Pittman, 2005, p. 193). These benefits have been difficult to find.

Many economies have also learned the hard way that whereas vertical separation and open access work well in some utilities, this is not necessarily true of railways because of the high proportion of fixed cost, upstream economies of scale and the locus of vertical separation (Pittman, 2005, pp. 2–7). Research suggests that 25% of delivered costs of railways are infrastructure costs versus 5% for electricity and 2,5% for gas. In addition, if one takes the example of power plants, for instance, small power plants can be almost as competitive as bigger plants (if not just as competitive), whereas density is the holy grail of railways. In fact, it is at the interface point between fixed and rolling infrastructure where real efficiency can be gained (Sanchez, 2001, p. 83). Or, as Pittman states, 'the effectiveness of the operations depends on the exact point where vertical integration or vertical separation takes place' (Pittman, 2005, p. 185).

[1] Burgeat, 2002, p. 43; Amos, 2007, p. 6; Pietrantino and Pelkmans, 2004, p. 35; Van de Velde and Van Reeven, 1999, p. 360; Pittman, 2005, p. 181; Bouf et al., 2005, p. 11.

In summary, vertical separation, specifically in the case of freight railways, must at best still be seen as an 'experiment' (rather than the developing status quo, as the Khuthele document implies), and the conditions under which the experiment could be attempted can be distilled from case studies. These conditions are:

1. The maturity and size of the economy. Mature and rich economies would normally have the depth of funding and required skill set to consider this possible change to vertical separation.
2. The density or potential density on the network. Low-density networks do not benefit from economies of scale and could, therefore, also be a target, especially if governments are considering subsidies in a developmental context. (In the South African context branch lines are a potential candidate for open access.)
3. The number of clients and origin-destination pairs (ODs). Many ODs mean that a disconnection between the core network and operator is possible. When there are few ODs, the railway operates like a factory and integration is always better, especially if only a few clients are served, which will make it possible to integrate operations with terminals.

In South Africa's case, none of these conditions for vertical separation are met (except for branch lines), especially if corridor transport is provided wholesale into terminals and integration is, therefore, indicated. The railway (as with the transport of bulk, long-haul, low-cost mining commodities) then operates as an integrated factory – also on corridors.

SOUTH AFRICA'S POSITION

Given the current unproven track record of vertical separation options (even the World Bank has not yet taken a specific position) (Amos, 2007, p. 9) and the many potential problems associated with implementation, an early adoption by South Africa must be questioned. The costs associated with such an approach, the substantial skills required (Van de Velde and Van Reeven, 1999) and the effectiveness losses due to density challenges seem immense. Amos (2007) attempts, in fact, to categorise economies where the 'experiment' could be attempted and also where possibly not, and maintains that in smaller markets costs specifically appear to be disproportionate to the potential benefits. The South African rail system quite clearly requires improvements, but much better approaches exist to achieve these improvements. Cost – as the final measurement of efficiency and effectiveness that is the agreed overarching objective – should be a prime consideration.

FREIGHT TRANSPORT ISSUES IN SOUTH AFRICA

South Africa is a large, sprawling country with an economy relatively smaller (compared with the rest of the world) than its land mass and the freight flows that are required to sustain the

economy. The discovery of gold and diamonds during the nineteenth century led to the establishment of a large industrial complex in the middle of the country. Coal, iron ore and manganese deposits were subsequently also discovered in the hinterland and are today effectively traded internationally, despite their being furthest away from a coastline than any other internationally traded deposits in the world. To sustain these mineral exports and the densely populated hinterland with its ever-expanding manufacturing industries requires a relatively well-developed freight transport capability. Freight demand for South Africa is depicted in Figure 1.

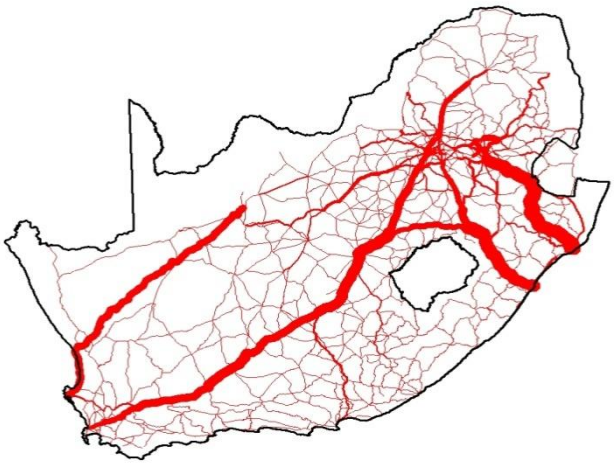

Figure 1 – Freight demand in South Africa

In Figure 1, four core flows can be observed, of which two are very dense ‘conveyor belts’ of coal and iron ore towards the coast, transported by highly efficient rail ‘export machines’. All of South Africa’s rail flows are illustrated in Figure 2.

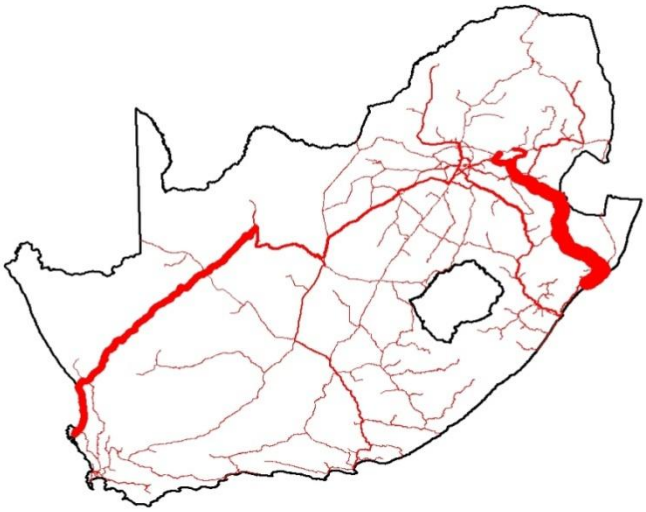

Figure 2 – All rail flows in South Africa

However, if flows are depicted instead as the flow of *value*, a different picture emerges (see Figure 3).

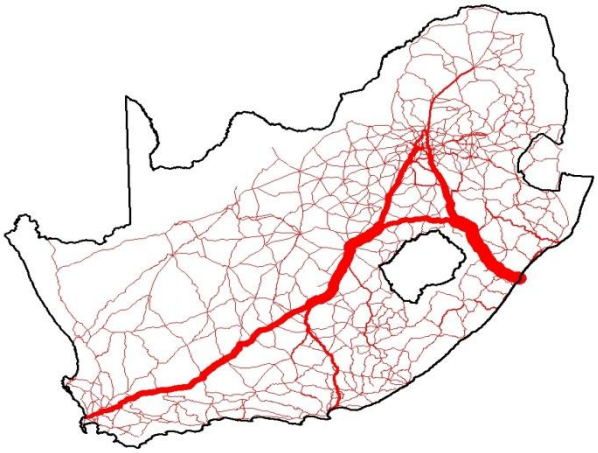

Figure 3 – The flow of value in South Africa

As is to be expected, the railways transport mostly low-value commodities; the high-value flows are by road (South Africa has no inland waterways). The two high-value corridors, however, are highly dense, quite long (1 450 and 600 kilometres) and very suitable for intermodal transport. Unfortunately, no domestic intermodal solution has been developed for South Africa.

The importance of costs

South Africa's transport costs as a percentage of total logistics costs are extremely high – currently at 50,4% (De Jager et al., 2008, p. 19), compared with the global average of 41% (Rodrigue, 2007, p. 84). Although it is true that for large countries this indicator is higher than the global average, these countries' transport-cost percentages nevertheless are lower than

that of South Africa. In the United States, for example, the figure is currently 48% (Wilson, 2008, p. 27). Large sprawling countries that are spatially challenged in terms of the location of industry in relation to their markets obviously attract higher transport costs, but South Africa's case is extreme, as is evidenced by the World Bank's Logistics Performance Index (LPI) rating for domestic transport costs, according to which South Africa ranks 124th in the world, compared with its 24th position ranking for its overall logistics performance (Arvis et al., 2007, p. 27). As with many advanced economies (in which the same trend is visible), this must be an area of opportunity, but even more so for South Africa because transportation costs' relative contribution is much higher than for these countries. The fact that South Africa's transportation unit costs (i.e. cost per ton-kilometre) are in fact very low – the result of a low ratio of user contribution to infrastructure usage, the relatively low cost of fuel compared with Europe and the non-collection of externality costs – is often forgotten in this context. It is when the unnatural spatial dimension is added that the cost accumulates, and this makes the country especially vulnerable to rising fuel costs, environmental concerns and the high cost of road infrastructure.

The specific spatial challenge for South Africa is further illustrated by the fact that, although South Africa contributes 0,4% of the world's GDP, 1,2% of the world's ton-kilometres are required for this output (Havenga and Pienaar, 2005, p. 9). The fact that 6% of global maritime ton-miles are generated by South Africa's ports (Chasomeris, p. 3) confirms the intrinsic and extrinsic nature of South Africa's spatial challenges even further.

In an assessment of how this spatial challenge should be addressed various considerations are necessary. A modal shift to road transport adds cost, which is the driver of the current debate when achieving efficiency and effectiveness is the objective. But, as is often the case in this regard, not all costs are considered and not all costs are accounted for, leading to imbalances in the system. Part of the problem is road infrastructure cost accounting.

The low concern for the infrastructure component of road costs as opposed to rail costs is clearly evidenced by the exponential increase in the size of South Africa's truck fleet (from 6 000 vehicles in 1938 to 270 000 in 2006). In 1990, at the point of deregulation, user-pay principles should have been installed and the railway shareholder should have invested in new intermodal capacity to equal the playing field and lower corridor transport costs to the economy. This was not done, which means that in addition to the 'fiscal neglect' that the Khuthele document acknowledges (Khuthele Projects, 2007, p. 8), the absence of *road* economic regulation also has a part to play in current problems. The road truck fleet increased by 60% from 1990, whereas the rail wagon fleet actually declined by almost 30%, and the locomotive fleet by 17%. This was compounded by considerable ageing of the rail fleet (making it less suitable for changing market needs). These factors made it more or less impossible for the railway to attract or retain corridor transport and impossible for the country as a whole to exploit the density advantage of the corridors.

If costs are the major problem in South Africa's domestic transport system, unnecessary wastage must be questioned. The drivers of costs should instead be identified and managed downwards in order to achieve strategic competitiveness for the country as a whole.

The drivers of freight transport costs in South Africa

Ideally, cost drivers should be considered by mode and by typology. Typology describes the four network types that exists in South Africa, i.e. export-line transport (the bulk long-haul movement of low-value commodities from mines to export harbours); corridor transport (large-volume transport of beneficiated and higher-value products over long-distance corridors between defined metropolitan centres); rural transport (long- and short-haul transport of low density in rural areas and between these areas, and feeding into corridors and metropolitan areas); and metropolitan transport (high-density local deliveries) (Havenga and Naude, 2006, p. 11; Havenga, 2007, pp. 141–147). The most important cost driver for road is fuel; for rail it is density. These relationships mean that in an environment with very low fuel costs, economies of scale advantages for rail would be lower (though still positive), but conversely in an environment with very high fuel costs rail's density opportunities would be invaluable to any economy.

South Africa consumes around 21,5 billion litres of fuel per annum (11,5 billion litres of petrol and 10 billion litres of diesel), which has an alarming effect on logistics costs in the current environment (SAPIA, 2008, p.17). Taking the current fuel price into account, the fuel cost for a seven-axle interlink as a percentage of variable costs is 71% (or 51% of operating costs). In fact, initial calculations show that a shift of 100 billion ton-kilometres (of the 200 billion ton-kilometres currently transported by road) could save the country 1,9 billion litres of fuel if it is hauled by rail electric power. This power could be generated locally and will constitute a foreign-exchange saving, but even if it were hauled by rail diesel power the saving would still be 1 billion litres of fuel.

As far as the network typologies are concerned, a more detailed evaluation is required. Bulk mining transport (71 billion ton-kilometres – mostly by rail) forms the biggest segment in transport in South Africa. It includes a dedicated rail system for coal and iron ore (66 billion ton-kilometres), which could be defined as a 'factory' and is already benchmarked as one of the best such systems in the world. The cost is low and it is highly unlikely that different institutional arrangements will affect costs (except to increase them). The only issue may be pricing, but the transparency required to address this issue could be solved in many straightforward ways. Transnet's approach is to create capacity in step with the mining companies' demand patterns, to the degree that the service can be afforded and based on long-term contracts. In these cases, the rail system is integrated with mine production processes and harbour activities and terminals, and any form of vertical separation would be counter-productive and harmful to a seamless, integrated, high-performing machine.

The biggest challenge for metropolitan transport (64,5 billion ton-kilometres – 2,5 billion ton-kilometres of which are by rail) is congestion alleviation, but South Africa's freight rail system plays an insignificant role in this sphere.

Rural transport (95 billion ton-kilometres – 26 billion ton-kilometres by rail[2]) requires an extensive network of low-density services, in the case of branch lines, which means that the per unit cost of transport will always be high and that difficulties will be experienced to exploit density. Where Transnet provides services in this typology it often refers to a 'secondary network'. Due to its nature, many of the arguments against vertical separation and especially open or third-party access are not valid and limited institutional arrangements could be investigated. This should be done in line with a plan to develop all logistics infrastructure in rural areas in order to achieve South Africa's development objectives.

The major opportunity for cost savings to the economy through the revitalisation of the rail mode and by exploiting the benefits of modal shift, therefore, seems to be with corridor transport, as discussed in further detail below.

OPPORTUNITIES FOR SOUTH AFRICA – CORRIDORS

The 160 billion ton-kilometres of freight on South Africa's corridors (of which only 31 billion ton-kilometres are via rail) cost the economy R117 billion and this freight is transported in a highly inefficient manner. This cost constitutes almost 68% of South Africa's total freight transport bill. Various scenarios can be investigated and modelling approaches exist that can be used to determine the cost advantages of large-scale intermodal solutions on specific corridors. Initial results show clear advantages (Havenga, 2007, pp. 209–216).

A modal shift to 50% for rail freight (from the current 14%) on the Durban corridor alone would decrease the freight bill for the corridor by R2 billion (or 1,8% of corridor costs); whereas a shift to 80% for rail freight will save R3,2 billion (or 2,8% of corridor costs). An 80% rail market share for all corridors countrywide would save R22 billion. A saving of R22 billion constitutes 12,8% of the nation's total freight bill, 6,5% of total logistics costs and 1% of GDP. Taking into account that freight demand will grow, the annual saving to the economy could be R22 billion by the year 2026 expressed at current market prices. (Another sobering thought is that an 80% rail market share on the Gauteng–Durban corridor by 2026 would mean that the N3 national route would only need to transport current volumes; the real effect of this saving, however, is not visible because current pricing and planning processes disconnect road infrastructure costs from usage.)

[2] It should be remembered that a large portion of rail rural traffic moves through rural areas without actually serving those areas, i.e. it is made up of mining commodities from rural areas to export harbours or manufacturing centres. Branch lines, which serve rural areas in general, are only a small portion of this network.

The economics of South Africa's current situation is unambiguous as far as an overarching freight transport strategy on a national level is concerned. Sanchez (2001) maintains unequivocally in a summary of many studies on this subject that '. . . for most studies returns to scale (defined as the impact on cost of a proportional variation in traffic levels and of the network variable) are practically constant, whereas returns on density (defined as impact on cost of increasing traffic while maintaining the network size constant) are clearly increasing' (Sanchez, 2001, p. 77). The country's core network is highly defined and has, as far as potential density is concerned, one of the highest potentials in the world – one which is not currently exploited.

Therefore, a modal shift in corridor transport is critical. This will be facilitated by capital investment, intermodality and service improvements on rail. The approach should integrate (rather than segregate) the corridors with domestic terminals and ports in order to develop a seamless, cost-effective, globally competitive solution that exploits density rather than hampering it. Executing this approach is in itself already a complex challenge; any further complexity will threaten the short- and medium-term execution of this plan. Transnet should be allowed to achieve the required turnaround in a focused environment without unnecessary distractions, especially since the current turnaround is proving successful (*Engineering News*, 25 July, 2008) and the underlying strategies are working. It should be borne in mind that the reasons behind the current challenges are decisions relating to the fixed infrastructure, which go back as far as the late nineteenth century, the network decisions of the mid-twentieth century and the lack of government investment of the early 1990s (Havenga and Naude, 2006, pp. 3–8). Given this, a swift turnaround could never be expected, but the recent four-year track record of success should at least prove that the current approach of reinvestment, integration around corridors and service-level improvements is working.

Certain open-access 'trials' involving the secondary network could be investigated, but in a ring-fenced fashion so that the focus on the core solutions as described in the previous paragraph is not endangered. A simple working group between the DoT and Transnet could be established to investigate possibilities. It is not certain whether a fully fledged RER with all its associated complexities is really necessary for this project at this time. This does not mean that the government as shareholder should not have a solid benchmarking and performance-evaluation tool in place. Such management tools are available and Transnet should co-operate fully to ensure that key performance indicators are established and independently evaluated. This process is possible through the normal governance procedure.

THE POSSIBLE ROLE OF A RAIL ECONOMIC REGULATOR

Given the specific circumstances in South Africa, the possible role of an RER is limited as far as freight railways are concerned. Primary and corridor transport should not be affected and

metropolitan freight rail transport is a non-issue, which means that only rural transport over branch lines could benefit by being ring-fenced and possibly restructured. If an RER is established anyway, this could be a point of departure for considering third-party access (i.e. the Brussels model, mentioned earlier).

If the overarching objective of any reform and the process of regulation is increased efficiency and effectiveness, then this objective should be considered for South Africa's entire freight system and not railways in isolation (after all, only 9% of the nation's freight bill is spent on rail). It is implied that modal shift will reduce total freight costs, but one of the direct drivers is in fact the cross-subsidisation of road freight by other road users. The Khuthele document also acknowledges that conditions for various countries would differ. Given the above analysis, a role for the regulator, if considered, could be as follows:

1. Pricing:

a. **The export lines**. These lines are 'captured', but systemic integration is key. The lines, together with the mines that they serve and the ports from which coal and iron ore are exported, form one systemic process, or 'machine', that competes with other comparative processes around the world. In fact, in some cases around the world, the lines and mines belong to a single owner. Vertical separation will drastically hamper South Africa's competitiveness. Transnet and the mine owners should be completely transparent in this regard and a regulator could play a role in engineering, overseeing or facilitating this mutual process in both directions. In short, a regulator would ensure that in terms of price neither the freight owner nor the railway is exploited (it should be remembered that, just as the commodity is 'rail-captured', the railway is 'commodity-captured').
b. **The corridor network**. Everything possible to achieve modal shift should be done. As far as pricing goes, the same process of transparency should be created between both rail and road modes and freight owners. If road transport is conducted according to the user pays principle and if the turnaround strategy for rail that is already showing results is allowed to continue, modal shift, as it is already being established, should happen. This will be especially so as long as no additional costs (such as costs that would be incurred by vertical separation) are added to rail. Once the user pays principle is implemented for road and cross-subsidisation is, therefore, removed from road freight, a regulator could facilitate the transparency that would be required by a single vertically integrated railway, the terminal operators and the freight owners. In summary, one must determine the real costs of all modes and ensure that the resultant pricing is related to these costs.
c. **Branch lines**. Branch lines are obvious candidates for third-party access, as the analysis illustrates. In this case, the regulator could assist with this process, but, in the same manner as other property transfer processes, also ensure that the economic viability of the different structures and its roles are protected. A good analogy is the two overarching principles of land reform, namely to ensure the sustained commercial viability of transferred land and the protection of the food

supply. This means that the rural freight system should be considered in its entirety, and pricing could even be subsidised to meet development objectives. A regulator could assist with this process. In summary, determine the real requirements and ensure that pricing, including subsidies, achieve the required objectives.

d. **The metropolitan network**. A regulator could play a role in decongestion not only by promoting passenger modal shift, but also through the regulation of road freight through congestion charges, etc. In summary, as with the corridor network, determine the real costs of all modes and ensure that resultant pricing is related to these costs.

2. Planning:

   The regulator could play a role in promoting an understanding of the symbiotic relationship between road and rail planning. Once the real potential of modal shift is understood, the effect of that shift should lead to an understanding of what infrastructure would be required. The regulator could facilitate the process of ensuring that both the required rail and road infrastructures that would lead to efficiency and effectiveness (the overarching objective) are developed. A performance management system could then be considered to ensure that both the rail and road infrastructures are economically maintained and efficiently used.

South Africa's particular history and circumstances clearly indicate that the role of an economic regulator should be that of a transport economic regulator. A blind belief that rail competition will achieve efficient and effective rail services is unproven, and such services could be costly and is complex. If the historic imbalances are addressed, reinvestment in rail maintained and the turnaround strategy supported, efficiency and effectiveness could be engineered in a much shorter time whilst protecting and promoting South Africa's competitiveness. A transport economic regulator could assist in this process by equalising the playing field and creating transparency, and through performance management.

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