

A Theoretical Perspective Informing Variables for Inclusion in a Railway Economic Regulatory Framework for Enabling Sustainable Regional Economic Development in Developing Countries-SADC

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Abstract

Transportation continues to be recognized as an essential sector contributing to the development of many economies. Railway Transport, in particular, due to its absolute advantage of transporting bulk and heavy cargo, is pronounced as a freight surface transport mode which can contribute to the sustainable development of the Southern African Development Community (SADC) of Africa. This regional economic community has economies primarily dependent on bulk exports and imports of freight influencing their balance of payments and this trade also serves as the basis for their economic growth. It is from this ideology that railway freight transport economic efficiency is desired. This paper gives a realization of the variables for inclusion in a Railway Economic Regulatory Framework for enabling sustainable regional economic development in SADC based on economic and competitiveness theories. A particular case of the SADC North South Corridor Railway Market is used as a sufficient and representative SADC railway corridor due to the multiple number countries (Botswana, Democratic Republic of Congo, South Africa, Zambia and Zimbabwe) involved defining this railway corridor. This North South Railway Corridor is argued to be representative because the railway networks of these countries are connected to most if not all the other ten railway corridors in SADC but all other corridor has a smaller number of countries.

Keywords: Railway economic regulation • Property rights • Railway corridor market • Competition

Introduction

This paper aims to contribute towards economic effectiveness in development and use of rail transport in meeting the aspirations of the Southern Africa Development Community (SADC) Member States through regional transport corridors. It is meant to catalyse 'change management' in rail transport policy planning that enhances goal congruence and effectiveness of national and regional economic policies [1]. The purpose is to improve how rail transport can effectively provide the backwards and forward linkages with economic sectors for their inter-dependence, growth, and investment and for trade facilitation-a railway economic regulatory framework. The argues for practical recommendations for SADC member states, using the North South Corridor as a case study. The North South Corridor (NSC) is chosen as the case study because of its geographical position and composition as it is defined by the interconnection of the railway networks amongst Democratic Republic of Congo (DRC)-Zambia-Zimbabwe-Botswana-South Africa. The SADC protocol on transport communications and meteorology

defines a transport corridor as, "a major regional transportation route along which a significant proportion of Member States' or non-Member States' regional and international imports and exports are carried by various transport modes, the development of which is deemed to be a regional priority". The other SADC Railway Corridors are: Lobito Corridor (DRC-Angola); Dar es Salaam Corridor (DRC-Zambia-Tanzania); Beira Corridor (DRC-Zambia-Zimbabwe-Mozambique); Nacala Corridor (Zambia-Malawi-Mozambique); Namibian Corridor (Namibia-South Africa); and Limpopo Corridor (DRC-Zambia-Zimbabwe-Mozambique); Goba Corridor (Eswatini-Mozambique); Ressano Garcia Corridor (South Africa-Eswatini-Mozambique) and Richard's Bay Corridor (South Africa-Eswatini).

Literature Review

The NSC railway corridor is currently run by the following railway companies in each national boundary: Transnet Freight Rail (South Africa); Botswana Railways (Botswana); Beitbridge Bulawayo Railways and National Railways of Zimbabwe (Zimbabwe); Zambia

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Railways Limited (Zambia) and Societe Nationale de Chemins de Fer du Congo (DRC).

This paper uses the railway corridor case study approach to develop arguments for a regional railway economic regulatory framework. This is because of the economic significance of the corridor concept as defined by SADC and more importantly, on realizing the corridor end to end significance of economic policies and regulations implemented in either of the corridor member countries [2]. This ensues from the fact that the corridor railway network and operators have to work in a coordinated manner as facilitators of their national trade and economic development.

Owing to the above, the factors influencing the need for railway economic regulation in both developed and developing countries are important to clarify. This clarification is to be based upon using applicable economic theories on regulation of the railway markets. Following this clarification, the paper then gives a critically informed philosophy of the factors expected to determine economic regulation of the North South Corridor and for the management of expected externalities thereof. In the Conclusion, argues on the deduction of railway economic regulatory theory for the North South corridor is given and prescription of the variables argued for maximization and/or minimization of externalities thereof.

Contemporary theories of economic regulation

The research narrowed to use the definition of transport economic regulation who said, "Economic regulation concerning transportation means the maintaining and being in charge of all the business activities. These business acts include:

- Entry of new firms in the market.
- Exit of the existing firms from the market.
- Pricing of the goods and commodities by the firms in the market.
- Services that are provided by the firms in the market concerning the various goods.
- Accounting of the firms.
- Financial concerns that are related to the activities of the firms in the market.
- Mergers, purchases and acquisitions that the firms indulge in order to expand their activities.

Transportation activities have economic significance as well Social as importance. It is mandatory for government regulation to exist in order to make sure that society derives benefits from it." Further in Chapter One, this definition was taken in complement with the six principles of Economic regulation at stipulated by department of business, innovation and skills of the United Kingdom which stated them as being accountability; focus; predictability; coherence; adaptability; and efficiency. In considering existing economic theory of regulation of an industry or firm, the research now moves to cross reference in quest to affirm the research conceptual framework.

In a system of natural liberty, a sovereign or government only has The society from the violence and invasion These are:

- Duty of protecting three responsibilities to attend to of other independent societies.

- Duty of protecting, as far as possible, every member of society from the injustice or oppression of every other member of it, i.e. establishing an exact administration of justice.
- The duty of erecting and maintaining public infrastructure and institutions to offer public goods that cannot be for the interest of the private sector or individual members of the society to erect or maintain.

Furthermore, in consideration of Adam Smith's postulated second duty of the sovereign's, the research takes to consider it relative to the arguments of property rights theorists who suggest that to minimize the role of the public sector, for example, market failure is most often than not due to a lack of property rights which, if specified, facilitate for optimal levels of any externalities. Facilitation of which is through specified individual incentives and bargaining between relevant parties.

Whilst these theories are based on a general deduction of markets, this chapter contextualizes them in respect to the North South Corridor (NSC) railway market. In terms of the NSC sovereigns' three responsibilities regarding regulation. It is noted that Adam Smith was stating the three responsibilities of a sovereign or government on supposition that:

- The market jurisdiction (society) is bound by one legislative authority-a government.
- There are other similar markets and/or substitute markets (other independent societies) within the same geographic space, with ability to serve the same customers and/or transport the same product, which can thus, penetrate the market.
- Players within the same market have the tendencies to exploit one another.
- In every market some services or infrastructure shall not appeal to the private sector and therefore, have to be provided by governments as or for the provision public goods.
- It follows that government or private needs to raise funds from private sector lucrative aspects for the market for re-investments.

Two critical principles from Adam Smith's assertions, first, both that the public and private sector are involved in separate activities and with different responsibilities and secondly, that the public sector should restrict itself to developing a legal and economic infrastructure for the private sector to operate in. However, he also argued that the public sector should remain active rather than simply responding to market failures. It is this, therefore, the proactiveness of the governments, subject to separate activities and different responsibilities it has from those of the private sector that this chapter advocates for in relation to a theory on railway economic regulation.

Economic characterization of the north south corridor railway market

Following from the above, it can be deduced that in respect to the SADC North South Corridor Railway Market economic regulation:

A corridor under multiple legal sovereign jurisdictions: It is a market composed of five (South Africa, Botswana, Zimbabwe, Zambia and the Democratic Republic of Congo) sovereigns whose railway lines interconnect in form of a chain providing freight transport services to one or more customers from one end or within the middle

of the chain to another end or to a point within the chain but having to traverse other sovereign(s) jurisdiction. One of the ends being the South African ports and the other being the trade and product source markets primarily in the other four countries. Can one railway economic regulatory regime be applied on a market constituted of multiple governments?

No multilateral commercially binding railway legislation: The NSC railway market does not have a harmonized nor documented railway specific economic regulatory regime, policy or legislation like is the case for the European Union which has had successive regional legislative instruments such as Directives 2012/34/EU meant to establish a single European railway market. The SADC protocol on transport communications and meteorology is the existing high-level policy document expressing agreed aspirations of SADC Member states regarding their transport corridors. Chapter 7 of the said Protocol is explicit on aspirations for the regional railway markets. The SADC Protocols are not legally binding. The regional railway operators currently have private interchange bilateral commercial agreements. Further to this, they also have private bilateral rolling stock leasing agreements.

In this regard, how is the NSC rail corridor pricing arrived at and, how effective is corridor pricing? Is it determined from the perspective and bargaining power of the commodity shippers who have to deal with moving commodities from one end of the corridor to another *via* a railway network under multiple sovereign legal regimes, different sovereign territorial operators and under differing customer service levels.

Regionally harmonized railway gauge: Unlike the Australian railway market, of which have been adversely impacted by the lack of interstate rail harmonization, including differing rail gauges and regulatory structures on the costs to safety and the economy, the NSC railway market has the advantage of having a common Cape Gauge (1067 mm) across the SADC. Therefore, whereas in the case of Australia, challenges of having different rail gauges from state to state as: incompatibility of rail lines, equipment and operating practices; inefficiencies within the rail manufacturing industry due to failure to optimize on economies of scale; lack of sustained continuity in production and consequently reliance on foreign supplier markets and therefore, a compromise on local manufacturing, employment creation and sustainability. From the Australian case, the research brings to light that the NSC railway market's having a common rail gauge network presents a spectrum of opportunities which can be economically exploited. How can these opportunities be economically maximized?

Different forms of competition the NSC railway corridor has to challenge: The NSC Railway Market is faced with multiple types of competition from other SADC railway corridors, from players with the NSC railway corridor market and also from other substitute modes of transport-predominantly road freight trucks. It is this phenomenon which postulated as a market requiring protection from the vulnerability of other independent markets and also that within the same market, there shall be plausible exploitation from other player of which government needs to protect against. Conventionally, the NSC railway corridor is subject to the following types of railway market competition.

Inter-modal transport competition is contemporarily understood as a situation where alternative modes of transport exist between two points, in this case, corridor end to end points and in this case the alternative transport modes being freight trucks and the railways. Factors that determine the market power of the alternatives and/or competitiveness will include speed, comfort, reliability, security, amongst other customer requirements. According to the OECD road freight transport is preferred over rail amongst other transport modes because it offers the last mile point to point service, enhancing the speed of end to end service, reducing the need for trans-shipment, thereby minimizing the risk of breakage or loss and allowing for surveillance of the cargo as a unit from its origin to its destination [3]. Whilst this argument may stand with SADC reporting a 10%-15% rail freight market share in the region compared to road freight (85%-90%), railways argue for their absolute advantages of bulk and heavy cargo movement thereby having capacity to deliver large volumes at once.

The primary difference between the road freight industry and the railway industry is the ease of entry and exit from the industry. Further, the road freight industry is more of a perfectly competitive industry because it presents itself as an economic model wherein competition, market entry and exit and a generally homogeneous product work together to force rates towards the minimum, long-run average variable cost [4]. Firms that are able to produce most efficiently survive, but the less efficient do not. A significant side effect of the road competitiveness is that these eventual average minimum road rates stand as a constraint to rail rates.

The competitive nature of road freight transport has thus involuntarily forced them into a defined market realm with similar parameters of operations. The NCS railway market including other corridors therefore requires corridor bespoke economic regulatory regimes relative to the competitive road freight industry competition. What absolute and comparative advantages to road can railway economic regulation maximize or minimize on to compete with road freight trucks?

Corridor route-based competition or competition over parallel tracks: This can be explained using a customer of, for example copper, from the Konkola Copper Mines (KCM) in Zambia, who is desirous to transport their copper *via* rail to the Port of Durban in South Africa. The customer shall be faced with the choice of two (in other instances more) train routes between KCM and the port of Durban i.e. the Plumtree Rail Corridor (Zambia-ZRL line from Livingstone into Zimbabwe-NRZ line to Bulawayo then into Botswana-BR to Lobatse and then into South Africa-TFR then to the port of Durban) and the Beitbridge Rail Corridor (Zambia-ZRL line from Livingstone into Zimbabwe-NRZ line to Bulawayo then linking to the BBR line to Beitbridge then crossing into South Africa-TFR then to the Port of Durban). In the event that these two lines are akin with respect to distance, reliability, security, speed, safety and comfort, then competition exists between the two routes and this is particularly between the NRZ-BBR and NRZ-BR rail sections and the collaboration between BBR and TFR and that between BR and TFR becomes of significance. It is these factors which therefore, determine the degree of competition between the two rail corridors. It is imperative to note, therefore, that the NSC Rail Corridor is composed of the two routes-Plumtree and Beitbridge rail corridors.

End-market competition: Suppose the KCM copper customer is actually interested in shipping his product to China from Zambia. This entails that the customer has alternative SADC rail corridors to use including the NSC, the Dar es Salaam Corridor (ZRL-TAZARA-Dar es Salaam Port), Beira rail corridor (ZRL-NRZ-CFM-Beira Port), among others. Thereafter, the commodity is shipped from the alternative ports *via* the ocean vessels to China. If the NSC, Beira Rail Corridor and the Dar es Salaam Corridor have sufficiently similar cost structure, reliability, security and journey time, then their respective market powers are limited, assuming the efficiency at the ports (Durban, Beira and Dar es Salaam) and the distances from the respective ports to China including also that maritime shipping leg from the ports to China is similar.

Since, the Ports of Durban, Beira and Dar es Salaam have differing structural relationships with their respective connecting railway operators, TFR, CFM and TAZARA, this becomes a significant factor affecting competitiveness of the corridor. Furthermore, the efficiency of the respective ports in receiving, handling, storing, loading and dispatching the product-copper onto the ships, at each of the respective ports is another factor. These factors therefore, limit the extent to which each of the railway corridors can raise its price in comparison to the other corridors.

Whilst the railway industry does not have direct control on the shipping vessels transporting commodities from the SADC ports to and from the global markets, e.g. China, it is however imperative that they know the efficiency and reliability of the vessels. Also, it is important to know the travel schedules, commodity load types and the lead time of delivery between the respective ports and the global export markets.

Another illustration of End-Market Competition whereby if two rail lines say, Dar es Salaam Corridor and North South Corridor serve different origins (e.g. their respective ports) but the same destination (e.g. KCM for the supply of Sulphur). Since KCM is connected to both corridors, the market power of each of the corridors is then limited by the difference in the Sulphur costs from the source and also the added logistics costs up to their respective ports.

Feasibility of allocating property rights to the NSC railway market players

A candid interpretation of Adam Smith's second responsibility of a government i.e. establishing an exact administration of justice, for every member of the society so as to protect them from injustice or oppression from every other member, can be postulated with appreciation of market failure is most often than not due to a lack of property rights. That is where allocation of property rights for individual players in a market is through facilitation of specified individual incentives and bargaining between relevant parties. Reading from the various types of competition the NSC rail market is exposed to, it is important to categorically determine the corridor market players, their incentives and bargaining power to ascertain who needs to be catered for administrative justice.

The first market player category is the governments or the institution with judiciary authority over the market or in the current perspective, those who primarily own railway operators on the NSC Page 4 of 7 rail market, of course within their respective jurisdictions with the exception of Beitbridge Bulawayo Railways (BBR) in Zimbabwe,

which is a privately owned and vertically integrated railway company running the section Bulawayo to Beitbridge.

The second is the railway operators and infrastructure managers. The NSC Corridor has a multiple number of operators but, registered and authorized to operate only within their national boundaries. The railway market on the NSC is vertically integrated under 100% government owned parastatal companies. This is with the exception of BBR. The railway operators (Transnet Freight Rail (South Africa); Botswana Railways (Botswana); Beitbridge Bulawayo Railways and National Railways of Zimbabwe (Zimbabwe); Zambia Railways Limited (Zambia) and Societe Nationale de Chemins de Fer du Congo (DRC)) are all statutorily mandated with the responsibility to manage, operate and maintain both the rollingstock and infrastructure within their respective jurisdictions.

It is however, imperative to note with regard to rollingstock operations and use on the NSC railway market, as confirmed by ZRL:

- Current operations do not permit for locomotives of another railway operator to ply on another sovereign operator's rail network unless under special circumstances.
- Wagons (both loaded and empty) are allowed to cross and move on another sovereign operator's rail network but to be pulled by the locomotive of the operator within that jurisdiction.
- The NSC railway operators are allowed to engage in commercial leasing agreements for wagons, locomotives and other equipment such as maintenance and derailment rescue equipment from members of the corridor and also from players outside the NSC rail market.

This model of corridor operations where wagons are passed to another locomotive operator under a different jurisdiction is akin to that being practiced in Russia. Russian railway reform is such that the RZD (Russian main rail parastatal company) maintained a monopoly on both network services, including tracks, dispatching and scheduling, and locomotives and drivers whilst both its subsidiaries and private companies operate freight wagons and serve customers. However, for the NCS railway market, they are totally vertically integrated within their national jurisdictions but, interchanging wagons and operate like the vertical separation reform being practiced in Russia, when transporting regional or international freight traffic.

Third, as deduced from above that corridor shippers or customers in respect to their expectations of the NSC rail freight transportation services are significant players. From the postulation on all types of rail competition: Safety, security, speed and reliability are all essential ingredients for establishing rail market power [5]. These are attributes which ascertain the retention of corridor customers. Further, on rail freight commodities, as the table below will confirm, most if not all rail freight commodities form part of the major export and import commodities for the economies/societies traversed by the NSC Rail market. As such, it could even be fair to refer to the rail freight commodities as strategic economic commodities. It therefore, ensues that rail freight/commodity owners-the customers must have significant rights and market power. Considering the bulk and heavy nature of rail freight commodities on the NSC, as can be seen from the table below, a clarification on the rail market relationship between the commodity producers and commodity shippers and the rail operators and respective governments, as the other identified market

players is cardinal to establish their appropriate requisite property rights.

Commodity centrism of the NSC railway market

Arguing further to the above, the NSC rail market can be referred to as a rail corridor transporting or facilitating international trade of regional strategic commodities. This is because the commodities being transported *via* this corridor form part or in some instances the main import or export commodity for the economies on this corridor. It becomes appealing to establish whether or not the NSC rail market share of freight is significant relative to its capacity and whether it satisfactorily provides for the customers' essentially desired ingredients which establish rail market power. These being safety, security, speed and reliability (Table 1).

Country	Type of products	Import origins/ export destination	Products competitively transported/ transportable by NSC rail?
DRC	Main imports	Packaged medicaments; Human and animal blood; Refined petroleum; Poultry meat; Foodstuffs, Mining and Other machinery, Transport equipment	South Africa; China; Zambia; Belgium; Luxembourg; India; Tanzania
	Main exports	Cobalt; Refined copper; Copper ore; Cobalt oxides and Hydroxides; Cobalt Ore diamonds, Gold, Wood products, Crude oil, Coffee	China; Zambia; South Korea; Italy; Indonesia; Finland
Zambia	Main imports	Copper ore; Cobalt oxides and Hydroxides; Refined petroleum; Crude petroleum; Nitrogenous fertilizers, Machinery, transportation equipment, Electricity, Foodstuffs, Clothing	South Africa; DRC; China; Kuwait; UAE
	Main exports	Raw copper; Refined Copper; Cobalt; Raw tobacco;	Switzerland; China; India; South Africa; DRC
	Postage stamps		

Zimbabwe	Main imports	Broad casting equipment; Packaged medicaments; Delivery trucks; Corn; Refined petroleum, machinery and transport equipment, other manufactures, chemicals, fuels, food products	South Africa; China; India; Zambia; Hong Kong	All depending on capacities of the railway corridor
	Main exports	Raw tobacco; Ferroalloys; Diamonds; Chromium ore; Raw sugar, platinum, cotton, gold, ferroalloys, textiles/clothing	China; South Africa; The UK; India; Zambia, Mozambique, UAE	All depending on capacities of the railway corridor
Botswana	Imports	Foodstuffs, machinery, electrical goods, transport equipment, textiles, fuel and petroleum products, wood and paper products, metal and metal products	South Africa, Canada, Israel	All depending on capacities of the railway corridor
	Exports	Diamonds, Copper, Nickel, soda ash, beef, textiles	Belgium, India, UAE, South Africa, Singapore, Israel, Hong Kong, Namibia	All depending on capacities of the railway corridor
South Africa	Main Imports	Crude petroleum; Refined petroleum; Cars; Gold and broadcasting equipment, machinery, chemicals, petroleum products, scientific instruments, foodstuffs	China; Germany; USA; India and Saudi Arabia	All depending on capacities of the railway corridor
	Main Exports	Gold; Diamonds; Platinum; Cars; Coal briquettes, other metals and minerals, machinery and equipment	China; United States; India; UK; Germany, Japan Botswana, Namibia.	All depending on capacities of the railway corridor

Table 1. Main regional import and export commodities for the NSC economies as at December 2017.

Commodity origins and destinations of the rail freight have been luridly expressed as significant influencers of rail market power and/or competitiveness. With knowledge of the NSC rail market freight commodities, it therefore becomes important to establish the significance of commodity origins and destinations for determination of the economic competitiveness of the NSC rail market.

Railway sector Investors are also notable players to consider. Reading from the African competitiveness report by the World Economic Forum-WEF the development of transport infrastructure has stagnated [6]. The WEF highlights that development banks such as the African development bank have been encountering significant difficulties in disbursing loans and grants for infrastructure development. Stagnation of transport infrastructure and service development has been further worsened by the tighter public budgets and banking sector liquidity hence the need for new solutions.

The Brazilian railway market, regulatory governance attracts investors for logistics infrastructure because it pronounces fundamentals including: Stable policy framework for long-term planning and consistent decision making; strategic capacity to develop infrastructure that goes beyond political and administrative convenience; enhanced understanding of public-private investments; regime credibility and no attitude to ad-hoc renegotiation of contracts/concessions; and guidance on resourcing of regulatory agencies.

Minding the contrast between railway economic regulation and surface transport regulation

Differently argued under the types of competition the NSC Rail Market faced, as an addition to the aforementioned, drawing from the recommendations by Australian Railway Association, OECD, Sampaio, Dutra, Edson Gonçalves, Mariam Daychoum and Palermo regulation of the railway sector cannot be separated from regulation on road and or surface transport. As such, it is imperative for railway freight economic regulation to be done with sensitivity to the road freight (trucking) markets using a comparable factor. For this reason, corridor freight tariff comparison for road and rail in respect to the commodities transported by both surface modes on the NSC corridor is recommended for consideration [7]. This also implies investigating the factors determining corridor tariff rates. Thus, the consideration of the corridor freight tariffs will also provide a platform for investigation into the NSC rail market economic rents. The understanding of logistics chain market power can be better explained in terms of types of economic rents-and effects they have on the logistic chains. He substantiated his assertion with the identification of three types of economic rents-market power rents, Schumpeterian rents and Ricardian rents.

Schumpeterian rents: These are 'transient surplus earnings above the costs necessary to deploy and use a resource. They emerge in the process of creative destruction in markets and result from new combinations of resources (including new modes of organization) that entrepreneurs initiate'.

Collative innovative activity forces socio economic change which determines long-run economic evolution.

As such, Schumpeterian rents may arise from incremental innovations, radical innovations, change in technology systems combining incremental and radical innovations, and also, through techno-economic paradigm shifts. Further, new techno-economic paradigm is not only about new products and productivity systems but is essentially involves: Having potential for use in pertaining market environments; being characterized by elastic long-run supply conditions; and most importantly facilitating cost reductions and therefore the overall cost of doing business [8-10]. Ricardian rents-economic rents on land is the value of the difference in productivity between a given piece of land and the poorest piece of land (or the land most distant from the market) i.e. producing the same goods (bushels of wheat) under the same conditions (of labour, capital, technology, climate).

Conclusion

In this paper, the pithy appreciation of economic regulation relative to railway transport corridor markets has provided critical insights into the fundamental aspects characterizing a Railway Economic Regulatory Framework. Principles of economic theory and applicability were extended in consideration from focusing on a nation's economic market to the practicality of a railway economic market constituted by sovereign national railway sections interconnected to form a railway corridor which, in most instances, aspires to serve freight customers as a seamless railway network from one end to another.

Owing to the aforementioned, the paper has inferred an economic characterization of the North South Corridor Railway Market relative to fundamentals of economic theories as postulated by Adam Smith. It has been deduced that the NSC Railway Market currently characterized as follows:

- A market is governed under multiple (sectional/national) legal sovereign jurisdictions.
- The market has no multilateral commercially binding railway legislation.
- The market is advantaged to have a regionally harmonized railway gauge.
- The market is exposed to different forms of competition.

These characteristics may collectively be unique to the SADC and NSC railway market alone but, taken one by one, other economic regions and federal states like the European Union, Australia, Russia, Japan and America amongst others have faced similar situations and they continue to attempt different methods of enabling their railway efficiency and economy efficacy by employing various and varying economic regulatory initiatives. Some of these characteristics may be influenced by political, economic, social and technical factors. A further elaborate investigation is therefore proposed on this aspect.

In addition to the above, the paper has also established the market players who can rightly be termed as stakeholders of a railway economic regulatory framework because of their identified stake-the roles, responsibilities and expectations from them with regard to the economic plays of the Railway Market. This exercise conducted under the context of arguing for the feasibility of allocating property rights to the different role players in the NSC railway market.

Allocation and weighting of these properties rights to the identified players becomes an essential element proposed to characterize the railway economic regulatory framework. These have been profiled to include: Governments or the institution with judiciary authority over the market; railway operators; infrastructure managers; corridor shippers or customers; commodity peculiarity, origins and destinations; and Railway investors.

With the above economic regulation factors identified, a quantitative and qualitative assessment of the NSC railway market relative to these factors and the carrying capacity of the railways, is proposed to so as to confidently test the hypothesis: 'Factor optimization and minimization through railway economic regulation can yield predictability of operations, return on investments and service delivery for sustainable economic development on the North South Corridor.' Ensuing from this hypothesis test, a best fit NSC railway economic regulatory framework can be recommended.

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