

The value of opening terminals to private operators

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The South African container terminal governance model

Most ports around the world are governed following the landlord port authority scheme. Under this management model, terminal operations are awarded to private companies using long-term concession agreements that are signed between the (public) port authority and the private terminal operator. South African ports constitute an exception to this rule. All major ports in South Africa are owned and operated by state-owned Transnet, and its respective divisions such as the port authority Transnet National Port Authority (TNPA) and terminal operator Transnet Port Terminals (TPT). TPT is responsible for the cargo handling and logistics management solutions at the container terminals of the ports of Durban, Port Elizabeth, Ngqura and Cape Town. This governance model created a factual monopoly in the container terminal operating business in South Africa. TPT only faces competition from global terminal operators active in seaports located in neighboring countries such as Maputo (Mozambique), Walvis Bay (Namibia) and the ports on the islands of Mauritius and Madagascar. Still, both competition in the market and competition for the South African gateway cargo market remain limited. Opening up container terminal operations in one or more terminals in South Africa to outside terminal operators could change competitive dynamics in the region.

The use of game theory for the study of South African port competition

Game theory offers insights into the possible effects of the mobilization of private capital and management skills in South African ports. We use a game theory model to examine the implications for the stakeholders of a possible decision by Transnet to open up the container terminal business to outside operators. A non-cooperative model was developed to compare the current situation in South African ports with hypothetical scenarios of opening up one of the terminals to private business. A linear market area of unit length is assumed, with identical consumers evenly spread over this interval. We consider two ports in this simulation: we assume that TPT continues to operate terminals in Durban while one terminal of the Port Elizabeth/Ngqura cluster is opened up to private terminal operators following a form of landlord management system. The ports considered compete for inbound and outbound gateway cargo.

The model presented in this study is based on the Cournot model of competition in the terminal handling industry (figure 1). Quantity competition is perceived as a choice of scale that determines the firm's cost functions and thus determines the conditions of price competition.

The competition that is expected to take place when one of the terminals is concessioned will be concentrated on the

terminals. The competition modeled is inevitably between the four container terminals: two in Durban, one in Port Elizabeth and one in Ngqura. For simplification reasons, we model the ports of Port Elizabeth and Ngqura as one. Apart from the fact that these two ports organizationally belong to the same authority, they are also in close physical proximity of around 19 kilometers. The analysis is based on the examination of the changes in the direction of the values (increase/decrease) of the policy choice variables rather than the absolute values.

Opening up the South African terminal business

The competition that is supposed to take place after Transnet opens up the container terminal handling operations to private interests is expected to bring new balances in the port business in the South African region. Although the game is a simplification of reality with a number of assumptions, it manages to grasp the vital components that need to be taken into account by Transnet. The pay-offs for Transnet can be translated into profits but also into other rewards that might follow the decision of concessioning one terminal. Besides, Transnet is a public entity and is not expected to have profit maximization as the first and only objective.

The results of the model show that it is in Transnet's best interest to open up the terminal business to outsiders. In doing so, Transnet's profits increase considerably in both ports even though now it operates three rather than four terminals. The increase in operational efficiency stemming from imminent port competition seems to outweigh the fact that TPT will operate one terminal less.

In addition, terminal and thus port efficiency, interpreted as a function of capacity, increases in the port of Ngqura. This will have a positive impact not only on the port but also on its users who will have the chance to enjoy better quality services. Positive impacts are also expected on the distributional channels and corridors, especially the ones connected to the port of Ngqura. Eventually all of this should invoke a boost in the economy of the area surrounding the ports and their hinterland which is one of the intentions and goals of the authorities of the region.

The private terminal operator of Ngqura is also expected to have an advantage from the new setting. The model results show it would have high profits, especially when compared to the profits of Transnet from operating two terminals.

The model investigates the port system of the South African region by focusing on the operating conditions and the imminent competition of the container ports of this area. However, the South African port system faces competition from neighboring ports. This research could be further refined in the future by expanding the model in order to capture competition faced from ports outside South Africa.

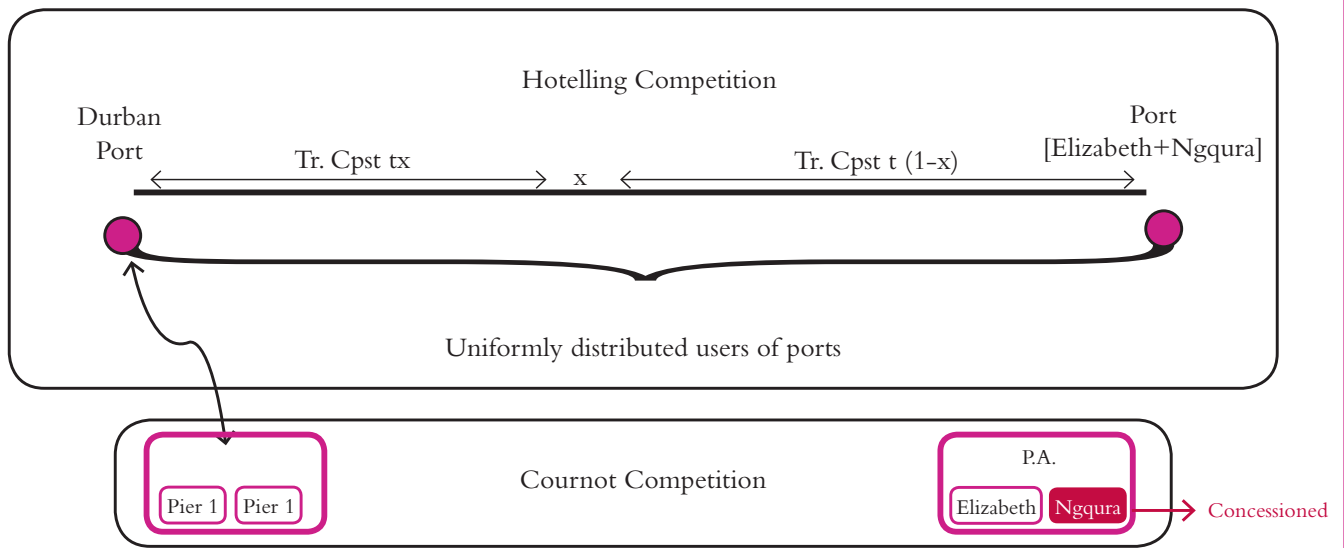


Figure 1: The linear city model under the Cournot model of competition adjusted to the South African ports case study.

ABOUT THE AUTHORS



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