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Editorial: China's Belt and Road Initiative

Since the opening up of the Chinese economy in 1979, China has grown to become the largest manufacturing and trading country in the world. This has been aided by global trends over the same period towards globalization and the liberalization of trade, in tandem with the development of regional economic blocks and free trade agreements. However, since the worldwide financial crisis of 2008, China has failed to replicate the phenomenal growth rates of the preceding decades (Timmer et al., 2016). Recognizing the need to overcome this slowdown in economic growth, President Xi Jinping first introduced the idea of establishing 'The Silk Road Economic Belt and 21st Century Maritime Silk Road' in September 2013, whilst on a state visit to Kazakhstan. In March 2015, this statement was followed up by the Chinese Government issuing an action plan for implementing the concept – which has subsequently become better known as the One Belt, One Road (OBOR) or the Belt and Road Initiative (BRI). The BRI is fundamentally focused on boosting regional economic cooperation (Huang, 2016) and connecting China to Asia, Africa and Europe, and is stated to have at its core the five major objectives of: policy coordination, facilities connectivity, unimpeded trade, financial integration and people-to-people bonds (NDRC et al., 2015).

The BRI revolves around the reinstatement and resurgence of the ancient land-based silk road that linked China to Europe through Central and Western Asia (now known as the 'Silk Road Economic Belt' (Li et al., 2015), as well as the reinforcement of maritime routes that connect China and other parts of Asia to Europe and Africa (now known as the '21st Century Maritime Silk Road' (Lim, 2015). Primarily, this will involve improving and reconfiguring logistics and transportation networks within the BRI trade/economic corridors (Lee et al., 2017) and, thereby, enhancing the connectivity among the countries along the route. Roughly 65 countries are involved in this. The BRI has become formalized within China's 13th Five-Year Plan (2016–2020) and has become one of the most discussed topics about China's evolving role in the world economy (EIU, 2016).

In terms of its practical implementation, the BRI revolves around the construction of an efficient infrastructure and transportation system which enhances interconnectivity between China and all its neighboring countries and regions, eradicates bottlenecks in cross-border trade, facilitates effective logistics systems and services and promotes greater demand for the carriage of freight. Much of the investment that is linked to the BRI is aligned to the development of the rail network, both within Asia and connecting Asia to Europe. Obviously, however, this is likely to have a significant impact on other modes of transportation, particularly liner shipping, as well on the wider aspects of the logistics system and supply chain management practices within the region. Understandably, many of the papers within this special issue reflect this emphasis on investment in transportation infrastructure and operations, with a focus on rail and shipping modes. However, it is important not to lose sight of the wider, more strategic, aspects of the BRI. For example, the BRI will foster new international relationships for China that will not only benefit the Chinese economy, but also the economies of the other countries affected. This will be achieved not only through China's direct investment in infrastructure and manufacturing within neighboring countries, but also by China's capabilities in exporting technological hardware and expertise. It is important to recognize, however, that the BRI does not take the form of aid. In fact, from a financial perspective it is actually underpinned by a system of loan financing where, as is normally the case, risks and returns need to be properly factored into the investment decision (EIU, 2016).

Given the scale, variety and geographical dispersion of the investments that are associated with implementing the BRI, it is obvious that there will be a significant impact on infrastructure and logistics provision, as well as on the origins and destinations of freight flows, within and around the area directly affected. This will entail a significant reconfiguration of the international logistics network, as the different impacts of BRI investments radiate out, and interact over time, from the locations where those investments have been made. Indeed, one of the primary objectives of the BRI is to improve, and generally to increase the efficiency and connectivity of, the affected logistics network. The first paper in this Special Issue on the BRI specifically addresses this complexity by developing a model which forecasts the evolution of the logistics network configuration, as a response to the dynamic and stochastic effects of BRI investments. Assuming a three-layer supply chain framework, Sheu and Kundu (in press) expound a spatio-temporal

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logistics interaction model, based on the use of friction functions that are integrated with a Markov chain, in order to produce multi-interval forecasts of time-varying freight flows on a pre-defined BRI-relevant international logistics network. The authors go on to illustrate the internal validity and potential use of the proposed forecasting model, based on two empirical simulations of China's oil supply network, with cargoes originating in West Africa and also the Middle East. The paper concludes that the analytical results obtained from the model will inform shippers, logistics service providers and government policy, not only with respect to optimizing route and mode choice decisions within the network, but also more strategic decisions on such aspects as: overseas infrastructure investments, the reallocation of resources and the reconfiguration of international logistics networks within the OBOR region. In so doing, the model provides support for achieving the primary objective of the BRI – as a vehicle to serve China's national and regional economic development goals.

The facilitation of e-commerce is one of the major objectives of the BRI. As might be expected, therefore, cross-border e-commerce is growing rapidly in China and in the wider region impacted by the BRI. With an estimated 50 million customers, the Alibaba Group is the major player within the region's cross-border B2C e-commerce market. In line with the BRI, the Alibaba Group and other companies in the region are enlarging their international logistics service networks by integrating more logistics service companies within them. This is happening within a context where the growing volume of e-commerce customers is exhibiting greater demand for more individualized logistics services within the BRI region. In order to develop logistics service capacity and, in particular, the potential for customization, larger investments are required in infrastructure development and management optimization. Motivated by some of the problems faced by the Alibaba Group and others, the second paper in this Special Issue by Liu et al. (in press) is concerned with how supply chain coordination issues arising from the BRI should be resolved and, specifically, how the cost of the required investments for better integration and coordination should be shared in an optimal manner by the parties delivering the logistics service supply chain. The authors apply a game-theoretic approach to test four models of cost sharing within the supply chain to determine the impact on prices, profits, logistics service performance and degree of customization.

It is apparent that transport lies at the very core of China's BRI, with both shipping and railways playing instrumental roles in facilitating international logistical connectivity, both within and beyond the areas impacted directly by OBOR investments. The evaluation of potential investments in transport infrastructure is, therefore, critically important to the ultimate success of the BRI. The paper by Shao et al. (in press) proposes a method by which construction decisions on large-scale transnational high-speed railway projects might be evaluated as part of the implementation plan for the BRI. The method they advocate involves identifying and prioritizing those existing sections of the transnational road network within the OBOR region which are best suited to the construction of rail links. To facilitate this, the authors develop a model which not only takes into account the topological features of the road network within the geographical area considered, but also factors related to the logistics cost of imports and exports, political stability and national cooperation within the region, as well as the other political characteristics of the countries covered by the network. An important component of the model is an index of the level of cooperation between China and other countries within the BRI region that is functionally dependent upon international policy considerations, infrastructure construction, international trade and capital flows. This is utilized for deriving travel times on road links within the logistics network analyzed and exerts an influence, therefore, over the optimal paths through the network that link the major nodes and, ultimately, the road links that are identified as having priority for railway construction. The model is validated and tested using data on import and export volumes for 2015. The results reveal 18 sections of road within the BRI region which currently fulfill the priority conditions for building a high-speed railway link. A comparison of these with rail projects which are either under construction or currently planned reveal a high degree of overlap.

In a similar vein, the fourth paper in this Special Issue, by Zhao et al. (in press) also looks at the issue of evaluating infrastructure investments. In this case, however, the focus rests with the evaluation of potential cargo consolidation centers as a proposed solution to problems on the rail network such as: insufficient cargo supply, low load factors, low profit margins and pressures for government to subsidize rail freight operations. Based on China's current government policy and existing international rail operations, as well as regional development plans for the future, 27 candidate consolidation centers are identified. The authors construct topological transportation networks for all of China's national railway and road system that connects the candidate cities and then, by applying complex network theory, an index is developed for assessing the importance of each node within the overall multimodal logistics network. Using a TOPSIS model, the top 10 candidate locations are identified. Based on the predicted cargo demand in 2020, a mixed integer programming model is then developed and applied to this shortlist of 10 candidates for the purpose of determining the final ranked selection of optimal consolidation center locations. The best locations are found to be Xi'an, Taiyuan, Zhengzhou, Wuhan and Suzhou, with the first four serving Northern and Central China and Suzhou serving South China. While Xi'an links only to the western and central corridors for intercontinental transport, all of the other locations utilize all three of the major intercontinental rail corridors for China-Europe cargo movements. This broad usage of all the available corridors avoids issues surrounding the potential for corridor competition arising out of the chosen locations for the cargo consolidation centers. The selected consolidation centers also have the advantage of being multimodal, since they all combine railway and road transportation, but also even include ocean shipping at some locations. It is true to say, however, that access to and from the consolidation centers relies on roads rather more than railways, because of the relatively shorter distances within China compared with the distances from China to European destinations. Very much in line with the previous paper, the authors do point to the potential for future evaluation of whether the efficiency of the selected consolidation centers could be increased by the construction of new railways to replace some of the road routes.