

A systematic review of China's belt and road initiative: implications for global supply chain management

Article (Supplemental Material)

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Table 1: Summary of Basic Sample Characteristics – Journals Publishing the Articles

Journal	Number of articles
China and World Economy	8 (4.62%)
China Report	7 (4.04%)
Croatian International Relations Review	7 (4.04%)
Sustainability (Switzerland)	6 (3.46%)
Chinese Journal of Comparative Law	5 (2.89%)
Baltic Journal of European Studies	4 (2.31%)
International Affairs	4 (2.31%)
Journal of Chinese Economic and Business Studies	4 (2.31%)
East Asia	4 (2.31%)
Geography, Environment, Sustainability	4 (2.31%)
International Spectator	3 (1.73%)
Journal of Cleaner Production	3 (1.73%)
China Economic Review	3 (1.73%)
Revista de la Facultad de Ingenieria	3 (1.73%)
Geopolitics	3 (1.73%)
Boletin Tecnico/Technical Bulletin	3 (1.73%)
Environmental Earth Sciences	3 (1.73%)
Journal of Eurasian Studies	2 (1.15%)
Eurasian Geography and Economics	2 (1.15%)
European Transport - Trasporti Europei	2 (1.15%)
Asia Europe Journal	2 (1.15%)
Europe - Asia Studies	2 (1.15%)
Central Asia and the Caucasus	2 (1.15%)
Renewable and Sustainable Energy Reviews	2 (1.15%)
Emerging Markets Finance and Trade	2 (1.15%)
American Foreign Policy Interests	2 (1.15%)
Science of the Total Environment	2 (1.15%)
Global Journal of Emerging Market Economies	2 (1.15%)
Other (one paper per journal)	77 (44.51%)
Total	173 (100%)

Table 2: The Part of the BRI Discussed in the Articles

Part of the Belt Road Initiative Discussed	Number of Articles
All	35
Silk Road Economic Belt	30
Maritime Silk Route	12
not clear	96

Table 3: Geographical Context of Study

Geographical Context of the Study	Number of Articles
Global	66
China	33
Central Asia	25
Europe	20
South East Asia	8
Russia	7
India	3
Taiwan	3
Pacific Ocean and Australia	2
Not clearly specified	6

Table 4: Summary of Aspects Discussed

Aspect Discussed	Number of Articles
Political science	70
Economical	55
Supply chain management	11
Environmental issues	12
Legal	9
Supply and Consumption of Natural Resources	5
Energy	4
Infrastructure	4
Other	3

Table 5: Summary of Supply Chain Management Literature in the Context of the BRI

Article	Content
Hsu (2016)	The study proposes issues related to innovative product development models with suggestions for its application and manufacturing servitization value.
Bao & Ma (2017)	The paper discusses the quantity decision by considering product quality in parallel supply chains where two manufacturers produce substitute products and then sell them to their downstream retailers separately.
Chen <i>et al.</i> (2017)	The study develops a game-theoretic model to analyze the competition between two container freight transportation modes (shipping and railway) using a competitive game strategic interactions method (deterrence) by taking account of the most cost effective scale of the transportation capacity settings.
Du & Shi (2017)	The paper uses dynamic games of incomplete information to analyze the game behavior between the government and the local companies of the China Railway Express to study whether the government subsidy policy is beneficial to the operation of the latter.
Gallo <i>et al.</i> , 2017	The paper proposes a mixed integer linear programming model to minimize the total energy consumption in cold chains of perishable products.
Lee & Cho, 2017	The paper aims to derive the optimal number of ports in the scenario where ports serve transship and domestic cargos.
Lin <i>et al.</i> (2017)	The paper focuses on developing a novel decision model for green supplier selection in the BRI through a fuzzy weighted average approach with social media.
Zhang (2017b)	The paper proposes an improved logistics path selection algorithm.
Chen & Yang (2018)	The study addresses a port cluster problem that considers industry transfer and the capacity constraints along the Maritime Silk Road.
Ruan <i>et al.</i> (2018)	The study proposes a concept of port service network that consists of a large hub and multiple ports. Ports of small and medium sizes can share their capacities of different types of port service with the hub.
Zhao <i>et al.</i> (2018)	The study redesigns the supply chain of agricultural products in southwest China under the BRI to improve its eco-efficiency by considering the associated agro-wastes flowing into bioenergy enterprises for energy production.

Table 6: The Expected Impact of the BRI on the Eight Factors that Determine the Location Decision (from Ellram et al., 2013)

Factor	Expected impact
Input/Product Factors	<ul style="list-style-type: none"> • Increased foreign direct investment and currency stability: The internationalization of the Chinese currency and the effective use (or re-balancing) of foreign currency reserves is one of the main motives for the BRI. • Improved access to primary resources: Infrastructural projects to facilitate access to primary resources make up a substantial part of the BRI.
Cost	<ul style="list-style-type: none"> • Easier access to (cheap) labor: Reduced transportation time allows for relocating in a larger geographical area providing access to a larger labor pool.
Labor	<ul style="list-style-type: none"> • Need for human resource development: Access to new labor often means low skilled or poorly qualified labor. A major issue is therefore the development of human resources.
Logistics	<ul style="list-style-type: none"> • Increased availability and reliability of transportation: Improvement of the infrastructure is a key objective of the BRI. • Reduced transportation time: Reducing the transportation time is a main objective of the BRI.
Supply Chain Interruption Risk	<ul style="list-style-type: none"> • The risk of disruption by disaster and/or terrorism increases: The BRI potentially extends the supply chain over a larger geographical distance and through several countries. • The risk of disruption by disaster and/or terrorism decreases: The BRI links supply chain partners closer together by reducing the 'perceived' geographical (i.e. time) distance.
	<ul style="list-style-type: none"> • The risk of disruption decreases through better infrastructure: Increased quality and dependability of the logistics infrastructure decreases supply chain interruption risk.
Strategic Access	<ul style="list-style-type: none"> • The access to suppliers and markets is increased: The BRI links peripheral countries to developed economies providing new markets and new possibilities for sourcing.
Country Risk	<ul style="list-style-type: none"> • Increased risk through bilateral relations: Cooperation with one country (for example Pakistan) may increase tension with another country (for example India) disturbing the status quo. This in turn may significantly affect the supply chain since sourcing, manufacturing and access to a market may become easier for the former but almost impossible for the latter. • Different degrees of investment risk: There are significant discrepancies in the development of BRI countries and investment risk. These different degrees of risk need to be carefully considered when designing the supply chain. • Risk through legal insecurity: Extensive government-to-government, enterprise-to-government, and enterprise-to-enterprise relations and transactions are likely to spur disputes. However, bilateral dispute settlement mechanisms are scarce and the legal systems within BRI countries is sometimes not easily accessible. This leads to further risk. • Need for sustainability considerations: A major concern is the 'outsourcing' of highly polluting and dangerous industries to countries with less strict environmental regulations. This would have a direct detrimental effect on overall supply chain sustainability.
Government Trade Policies	<ul style="list-style-type: none"> • Different taxation and custom rules: At this stage there are no free trade agreements. Hence, taxation and customs play major roles in supply chain costs. There are also no clear rules governing international contracts for carriage across BRI countries.

Table 7: Major Supply Chain Management Research Issues in the Context of the BRI

Topic	Supply Chain Management Research Directions
Supply Chain Configuration	<ul style="list-style-type: none"> • Observe how supply chains adapt over time to the new opportunities and challenges presented by the BRI. • Develop decision support systems that can handle a broad set of different suppliers within a global context. • Develop big data analytics that is able to handle the large amount of data potentially created by the scale of the BRI.
Supply Chain Resilience	<ul style="list-style-type: none"> • Conduct empirical research into supply chain resilience, specifically in transitional economies. • Develop means for assessing the risk of supply chain disruption (across multiple and diverse sources of risk). • Establish how infrastructure should be designed to provide high resilience to supply chains. • Establish maintenance plans for infrastructure in remote areas.
Supply Chain Sustainability	<ul style="list-style-type: none"> • Establish how the social dimension of sustainability can be realized in less developed economies. • Expand the extant literature by focusing on transitional economics and on the supplier perspective. • Reduce the impact of transportation on the environment. • Provide policy advice to avoid the 'outsourcing' of polluting industries. • Establish how visibility in global supply chains, as facilitated by the BRI, can be ensured to provide consumers with the transparency they desire.
Cross border Supply Chain Management	<ul style="list-style-type: none"> • Establish how local businesses in transitional economies (that cannot rely on large, third-party providers) handle cross border trade. • Provide means to support local businesses in transitional economies to cope with the complexities of cross border trade.
Adoption and Diffusion	<ul style="list-style-type: none"> • Identify the factors that influence the adoption and diffusion of the new infrastructure provided by the BRI. • Identify the factors that influence the timing of the adoption decision. • Establish to what extent the decision to adopt the BRI is viewed as an economic opportunity or as a cost of doing business.

Figure 1: Summary of Basic Sample Characteristics – Distribution of Articles per Year (until April 2018)

