

A FRAMEWORK FOR REGIONAL LOGISTICS PERFORMANCE

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Countries have traded with each other for thousands of years, yet the impact of globalization today is greater than ever before. Championed by the invention of shipping containers, global trade has been increasing, along with the world population and production and logistics technologies.

Logistics is “the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from point of origin to point of consumption for conforming to customer requirements.” Note that this definition includes inbound, outbound, internal, and external movements, and return of materials for environmental purposes” (Council of Logistics Management, 1998). Logistics management encompasses logistics systems both in the private business sector, the public/government and non-profit sectors (Coyle et al., 2016). Whether it be business, military, event, service, or humanitarian, logistics create the backbone of supply chain operations.

The Logistics industry accounts for about 14% of the world’s Gross Domestic Product, GDP (Rodrigues et al., 2005). Although the cost to GDP ratio reveals an estimate of the size of the logistics economy in a country, it does not necessarily reveal any information about the performance of the logistics systems in it. Many factors influence the Logistics Performance (LP, hereafter), both from the perspective of a company, and its dependence on others in a supply chain. Figure 1 displays such factors.

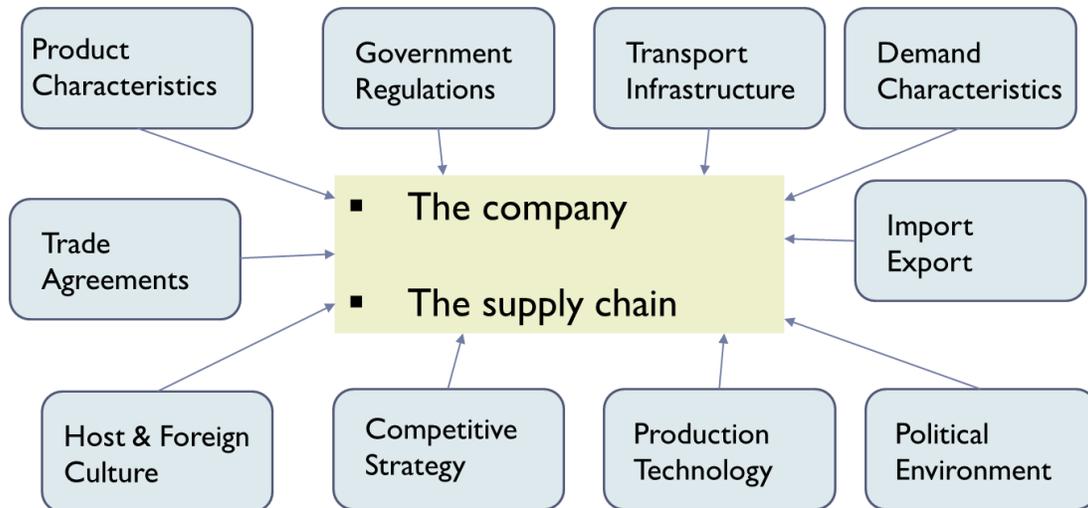


Figure 1. A holistic approach to factors impacting LP

The Logistics Performance Index (LPI) was developed by the World Bank in 2005, and it has been updated biannually. LPI provides scores on countries based on a composite index combining proxy measures related to transport infrastructure, supply chain management, and trade facilitation. In its essence, “the LPI is an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance” (World Bank, 2016). LPI focuses on the following performance evaluation rubrics:

- Efficiency of the clearance process (i.e., speed, simplicity and predictability of formalities) by border control agencies, including customs;
- Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology);
- Ease of arranging competitively priced shipments;
- Competence and quality of logistics services (e.g., transport operators, customs brokers);
- Ability to track and trace consignments;
- Timeliness of shipments in reaching destination within the scheduled or expected delivery time.

Although there is no one-size-fits-all solution for LP assessments at the macro level, LPI, at the very least, creates a means for the participating 125 countries to get into dialogue in their trades and their logistics operations. While LPI is a proxy for benchmarking at the country level, it does not necessarily help develop regional comparisons within a country. Figure 2 provides a general framework for the unit of analysis for LP.

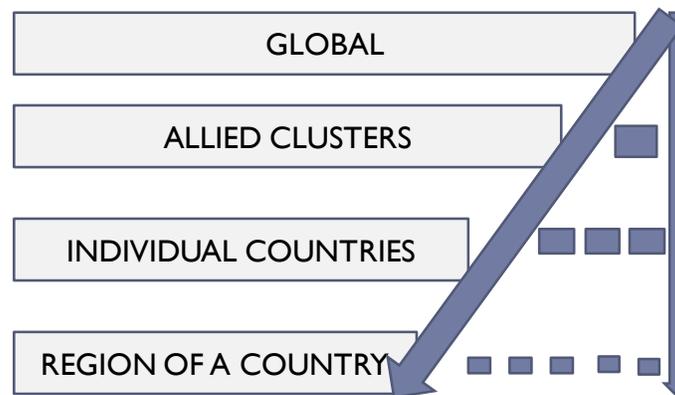


Figure 2: Possible scopes for LP analysis

Naturally, “global logistics” is the level where the highest level of aggregation is done. Such performance measures at the global level provide a benchmark to the allied clusters (e.g., the EU, NAFTA, ASEAN etc.). The level of specificity in creating the LP measures increases as the scope narrows down to the region of a country (e.g., the province of Nova Scotia in Canada, or the state of Ohio in the U.S.) As the analysis moves from global down to a regional level, the number of benchmarking regions also increases.

Regional Logistics Performance (RLP) has been lacking in the literature. There are three fundamental reasons for this: First, even LPI at the country level is relatively recent. Second, competitiveness at the regional level, compared to the national one, has not yet been well recognized. Third, it is hard to create a consensus on globally-accepted metrics to be used. Yet, RLP may be a vital tool for promoting regional prosperity and its benchmarking with its domestic counterparts. RLP is challenging, especially boiling it down to an index score, for two reasons: First, who will do it, systematically? Second, is the region industry-dense enough to collect data from? With these in mind, Table 1 proposes a framework for RLP that is relatively-easy to measure and use. The metrics are inspired by LPI measures and consider possible regional specificities.

General Attribute	Specifics
Location	<ul style="list-style-type: none"> • Ease of access to seaport • Ease of access to airport • Closeness to industrial hubs • Closeness to logistics hubs • Level of regional natural resources
Demographics	<ul style="list-style-type: none"> • Population density • Resident buying power per capita • Residents' average age • Level of business friendliness • Level of political stability in the region
Industry	<ul style="list-style-type: none"> • Level of industrial diversity • Import to export ratio • Ratio of inbound to outbound freight volumes • Total warehousing capacity • Total number of common carriers • Total number of big-box retailers
Infrastructure	<ul style="list-style-type: none"> • Availability of highways within region • Connectivity of highways to logistics hubs • Quality of highways • Availability of highways • Connectivity of highways to logistics hubs • Quality of highway services • Availability of seaports within region • Capacity of seaport • Quality of seaport services • Availability of airports within region • Capacity of airport • Quality of airport services • Availability of railroads within region • Capacity of railroads for freight transportation • Quality of railroad services • Level of intermodal transportation
Global shipments	<ul style="list-style-type: none"> • Level of documentation • Ease of customs clearing • Ease of loading/unloading • Level of supply chain fluidity
Logistics information	<ul style="list-style-type: none"> • Ease of tracking shipments • Quality of logistics information systems used
Workforce	<ul style="list-style-type: none"> • Immigration laws • Level of skilled labor • Availability of logistics educational programs • Student density • Labour regulations • Availability of licensed transport vehicle drivers
Sustainability	<ul style="list-style-type: none"> • Ratio of green companies • Ratio of green logistics service providers • Level of regional environmental regulations • Impact by climate change

Table 1: Proposed metrics for measuring RLP

Because there has been an increasing desire for greening supply chains and logistics services, and because environmentally-friendly products and smart operations drive costs down in the long run, and because governmental regulations on carbon emissions (most which relate to logistics) are getting tighter, the sustainability aspect of RLP is crucial (e.g., Ülkü, 2012). Sustainability has already been used as criteria used by the shippers in selecting their logistics service providers (e.g., Evangelista, 2014). Therefore, in addition to some core LPI measures, sustainability is appended in RLP metrics in Table 1.

RLP analysis provides a benchmark between the regions and may quantify the relative rank position of a certain region. This ranking then would enable local authorities to further analyze in what ways and how to improve RLP. To that end, for example, Data Envelopment Analysis is a reasonably good methodology to employ. Logistics capabilities play an instrumental role in the economic and social development of a region (e.g., Benton et al., 2016). Implementing efficient policies to improve RLP not only improves the regional competitiveness and prosperity of the region but also the country it is in.

Supply chain activities such as integrated marketing, transportation management, warehouse and distribution management, order fulfillment, channel management and global procurement generate massive volumes of data. Therefore, not only shippers but also the carriers see a great opportunity for improvement in their operations using big data, its analysis, and use in making better business decisions (e.g., Wang et al., 2016). Therefore, with advances in data collection and analytics for better business decisions, RLPs would further provide building blocks for strategic positioning of supply chains and their partnering manufacturing/service companies and logistics providers.

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