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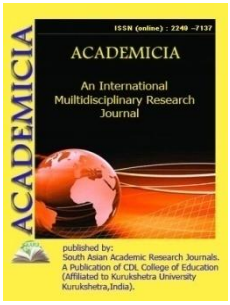

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EXPLORING THE LOGISTICS PERFORMANCE INDEX -A COMPARISON OF INDIA'S LPI STATISTICS WITH OTHER COUNTRIES

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ABSTRACT

Logistics Performance Index 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. LPI is a set of indicators that measure the performance of the logistics environment of countries on several logistics dimensions. There are two perspectives for LPI – international and domestic. This article describes the conceptual framework of Logistics Performance Index and throws light into India's domestic LPI data as on 2014. Germany and Netherlands are the most efficient and highest ranked LPI countries. LPI overall score reflects perceptions of a country's logistics based on efficiency of customs clearance process, quality of trade- and transport-related infrastructure, ease of arranging competitively priced shipments, quality of logistics services, ability to track and trace consignments, and frequency with which shipments reach the consignee within the scheduled time. The index ranges from 1 to 5, with a higher score representing better performance. The article also analyses the cross country comparisons of LPI scores of India in 2014 according to World Bank statistics.

KEYWORDS: *Logistics, Logistics Performance Index, LPI Scores*

1. INTRODUCTION

Logistics also play a major role in International trade relations. Enhancing the logistics framework has become an important goal in the worldwide economy. The establishment of global supply chains has brought the challenge to move goods rapidly, reliably and inexpensively around the world. Since the significance of logistics has steadily increased, there is a growing

need of evaluating its components and comparing the achievements of different countries (David, 2006). The Logistics Performance Index (LPI) calculated by World Bank is an instrument built on a survey of operators in charge of moving and trading goods. The operators provided feedback on the logistics disparities among the countries and the constraints they met throughout the time. The index covers a broad range of indicators such as the quality of infrastructure, the competence of private and public logistics service providers, the degree of corruption and transparency, the reliability of the trading system and supply chains, the efficiency of customs and border agencies. The information was gathered from more than 800 operators or agents of the world's main logistics service providers (World Bank, 2014).

2. LITERATURE REVIEW

Logistics has traditionally been defined as the process of planning, implementing and controlling the efficient flow and storage of goods, services and related information as they travel from the point of origin to the point of consumption. Some of the activities included in the logistics domain include transportation, warehousing, purchasing and distribution. Within this model, the locus of logistics control has been the individual firm. A more recent interpretation calls for logistics to guarantee that the necessary quantity of goods is in the right place and at the right time (La Londe 1983).

The reduction of organizational slack, of which inventory is a typical example, needs close coordination of and an intensive information exchange between the supply chain partners (Caputo 1996, Vollman et al. 1997). This current trend in using strategic partnerships and cooperative agreements among firms forces the logistics integration to extend outside the boundaries of the individual firm (Langley and Holcomb 1992).

E.Sandberg and M.Abrahamsson explore how to generate sustainable cmpetitive advantage in the best two Swedish practice-companies that successfully exploit logistics as a source of ompetitive advantage. By using a theoretical framework based on the resource results from review of a firm, the research elaborates the link between operational and dynamic logistics capabilities and sustainable competitive advantage. The study identified the five dynamic capabilities, namely managerial knowledge and presence, cross-functional teamwork, control, learning and supply chain relationships. Those all are vital for the continuous development of the bundling of logistics process and Information Technology (IT) systems. (Sandberg & Abrahamson 2011)

J.Tongzon examines the determinants of competitiveness in logistics and identified the key factors that are required for a successful logistics hub. For the logistics hub, the analysis on the determinants of competitiveness is made using Singapore as a case study before drawing some implications for the countries in the Southeast Asian region. The customers of logistics services do pay more attention to operation efficiency when selecting the services. Logistics operators in the service industry, should well understand the requirement of their customers and make efforts to meet and possibly exceed their expectations (Tongzon 2004).

R. Founou developed a framework for analyzing the contribution of IT in the logistics sctor. The paper concluded that IT would contribute to competitive advantage in limited cses and that most often the strategic necessity hypothesis would apply. The paper suggests a dual approach to information technology strategic management: first, the firm should develop the capacity to

efficiently implement some standart solutions on an opportunity-based approach; second, it should embed its IT system in the organization with a strong top management commitment and a clear strategic alignment. To create a competitive edge, logistics IT applications were predominantly outsourced (Founou2002).

J. Roy compared Canada's logistics and supply chain management performance, both in terms of international trade and from the perspective of innovative practices adopted by Canadian companies in the domestic market. The study also compared the performance of Canadian and American companies on the basis of logistics costs. Despite recent efforts by the Industries in Canada to understand and support Canada's logistics sector, much remains to be done in terms of assessing and understanding the performance level of Canadian companies regarding supply chain management (Roy n.d.).

3. Objectives

The study focuses on achieving the following objectives:

- To understand the Logistics Performance Index and its components
- To make cross country comparisons of LPI scores of India with other Asian countries

4. Methodology

The study is analytical in nature based on secondary data. The data has been gathered from Logistics Performance Index surveys conducted by the World Bank in partnership with academic and international institutions and private companies and individuals engaged in international logistics. The study also attempts to detect possible advances in logistics in India by comparing the first LPI data published in 2007 with the most recent data, released in 2014. Cross country comparisons of 2014 LPI scores of India with that of top performers and other Asian countries are also done. For this, World Bank 2014 report on Global trade logistics has been examined in detail.

5. Logistics Performance Index: A conceptual framework

The World Bank in its report Connecting to Compete 2014: Trade Logistics in the Global Economy, shows the performance of countries across the world on the basis of Logistics Performance Index (LPI) which is an indicator of on-the ground efficiency of trade supply chains, or logistics performance . The index ranks 160 countries depending on a number of aspects of global trade, including customs performance, infrastructure quality, and timeliness of shipments to reflect on the timeliness, cost and reliability of country's execution of international trade.

A close observation of the LPI reveals that it captures some crucial aspects which would have been very difficult to measure otherwise: perceptions of logistics environment, efficiency of customs, quality of transport and infrastructure, timelines of shipments in reaching destination, domestic logistics costs. LPI is reported on a scale of 1 to 5, where 1 means worst and 5 represents excellent.

According to the report, high-income countries dominate the top 10 rankings and also remained relatively unchanged since 2010. Germany is reported as the best performing country with an LPI score of 4.12 and followed by Netherlands , Belgium , United Kingdom , Singapore ,

Sweden , Norway , Luxembourg , United States , and Japan with an LPI score ranging from 4.05 to 3.91.

5.1 Logistics Performance Index and its Components

The importance of efficient logistics is now widely accepted by policymakers worldwide. Trade andcommerce are moved within and across borders by private operators. The efficiency of those supply chain -logistics performance- is what the Logistics Performance Index (LPI) and its components measure. This performance depends heavily on the policy environment: measured by individual countries or regional economic groups in infrastructure provision, regulation and development of services, or facilitation of trade through more friendly procedures at the border contribute substantially to logistics performance (WTO 2014).

The LPI survey was carried out through The World Bank's partnership with the International Association of Freight Forwarders (FIATA), the Global Express Association (GEA), and Global Facilitation Partnership for Transportation and Trade (GFP) (The World Bank 2002). The Logistics Performance Index (LPI) analyzes countries in six components:

- The efficiency of customs and border management clearance.
- The quality of trade and transport infrastructure.
- The ease of arranging competitively priced shipments.
- The competence and quality of logistics services.
- The ability to track and trace consignments.
- The frequency with which shipments reach consignees within schedule or expected delivery times.

The LPI consists therefore of both qualitative and quantitative measures and helps build profiles of logistics friendliness for these countries. It measures performance along the logistics supply chain within a country and offers two different perspectives: international and domestic.

5.2 International LPI

It provides qualitative evaluations of a country in six areas by its trading partners—logistics professionals working outside the country. LPI 2014 ranks 160 countries on six dimensions of trade -- including customs performance, infrastructure quality, and timeliness of shipments -- that have increasingly been recognized as important to development. The data used in the ranking comes from a survey of logistics professionals who are asked questions about the foreign countries in which they operate. The LPI uses standard statistical techniques to aggregate the data into a single indicator that can be used for cross-country comparisons.

5.3 Domestic LPI

It provides both qualitative and quantitative assessments of a country by logistics professionals working inside it. It includes detailed information on the logistics environment, core logistics processes, institutions, and performance time and cost data. International LPI based on the assessment of foreign operators located in the country's major partners, and weighs the average of the six components above (World Bank 2012).

The Domestic LPI looks in detail at the logistics environments in 116 countries. For this measure, surveyed logistics professionals assess the logistics environments in their own countries. This domestic evaluation contains more detailed information on countries' logistics environments, core logistics processes and institutions, and performance time and cost. This approach looks at the logistics constraints within countries, not just at the gateways, such as ports or borders. It uses four major determinants of overall logistics performance to measure performance.

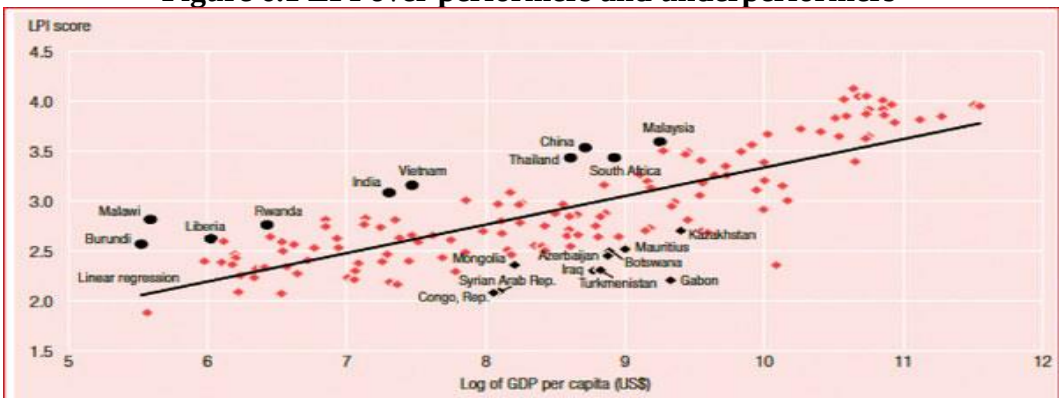
- Infrastructure,
- Services,
- Border procedures and time, and
- Supply chain reliability.

The components were chosen based on recent theoretical and empirical research and on the practical experience of logistics professionals involved in international freight forwarding (WTO 2012). LPI survey has been made 4 times so far, in 2007, 2010, 2012 and 2014. Based on a worldwide survey of global freight forwarders and express carriers, the LPI is a benchmarking tool developed by the World Bank that measures performance along the logistics supply chain within a country. Allowing for comparisons across 160 countries, the index can help countries identify challenges and opportunities and improve their logistics performance (WTO 2014). The index ranges from 1 to 5, with a higher score representing better performance (The World Bank 2014).

6. Domestic LPI statistics: Indian Scenario

With an overall rank of 54, India with the LPI score of 3.08 is ranked 3rd amongst lower-middle income countries. India is also reported as the over performing trade logistics performance amongst the non high-income economies (Figure 6.1). The other over performing non high-income economies are Malaysia , South Africa , China , Thailand and Vietnam . However, India's trade logistic performance has exhibited a fall as compared with 2010 when LPI score of 3.12 was recorded for the country.

Figure 6.1 LPI over performers and underperformers



Source: Logistics Performance Index, 2014

TABLE 6.1 DOMESTIC LPI, ENVIRONMENT AND INSTITUTIONS: INDIA 2014

Level of Fees and Charges

Based on your experience in international logistics, please select the options that best describe the operational logistics environment in your country of work	Percent of respondents answering high/very high
Port charges are	58.39%
Airport charges are	57.25%
Road transport rates are	51.09%
Rail transport rates are	48.53%
Warehousing/transloading charges are	48.18%
Agent fees are	16.79%

Quality of Infrastructure

Evaluate the quality of trade and transport related infrastructure (e.g. ports, roads, airports, information technology) in your country of work	Percent of respondents answering low/very low
Ports	34.56%
Airports	35.77%
Roads	41.61%
Rail	33.09%
Warehousing/transloading facilities	42.65%
Telecommunications and IT	13.87%

Competence and Quality of Services

Evaluate the competence and quality of service delivered by the following in your country of work	Percent of respondents answering high/very high
Road	21.01%
Rail	20.59%
Air transport	39.42%
Maritime transport	32.35%
Warehousing/transloading and distribution	21.9%
Freight forwarders	58.39%
Customs agencies	30.66%
Quality/standards inspection agencies	31.39%
Health/SPS agencies	22.63%
Customs brokers	51.82%
Trade and transport associations	37.23%
Consignees or shippers	53.68%

Source: World Bank 2014

TABLE 6.2 DOMESTIC LPI, ENVIRONMENT AND INSTITUTIONS: INDIA 2014

Efficiency of Processes Evaluate the efficiency of the following processes in your country of work	Percent of respondents answering often or nearly always
Clearance and delivery of imports	68.35%
Clearance and delivery of exports	65.94%
Transparency of customs clearance	39.42%
Transparency of other border agencies	36.76%
Provision of adequate and timely information on regulatory changes	32.85%
Expedited customs clearance for traders with high compliance levels	43.8%

Sources of Major Delays How often in your country of work, you experience	Percent of respondents answering often or nearly always
Compulsory warehousing/transloading	41.91%
Pre-shipment inspection	48.55%
Maritime transshipment	40.44%
Criminal activities (e.g., stolen cargo)	18.71%
Solicitation of informal payments	44.2%

Changes in the Logistics Environment Since 2011 Since 2011, have the following factors improved or worsened in your country of work	Percent of respondents answering improved or much improved
Customs clearance procedures	71.94%
Other official clearance procedures	39.42%
Trade and transport infrastructure	70.07%
Telecommunications and IT infrastructure	90.58%
Private logistics services	83.33%
Regulation related to logistics	72.46%
Solicitation of informal payments	46.38%

Source: World Bank 2014

Tables (7.1, 7.2 and 7.3) throws light into India's logistics environment and performance as on 2014 with respect to the following areas: level of fees and charges, quality of infrastructure, competence and quality of services, efficiency of processes, sources of major delays, and the various changes that happened in the Indian logistics environment across 2011 to 2014.

TABLE 6.3 DOMESTIC LPI, PERFORMANCE : INDIA 2014

	India	Region: South Asia	Income: Lower middle income
Export time and cost / Port or airport supply chain			
Distance (kilometers)	384km	209km	753km
Lead time (days)	2 days	2.3 days	3.4 days
Cost (US$)	492US$	2032US$	1626US$
Export time and cost / Land supply chain			
Distance (kilometers)	199km	231km	708km
Lead time (days)	2 days	2.8 days	4.4 days
Cost (US$)	430US$	1413US$	1780US$
Import time and cost / Port or airport supply chain			
Distance (kilometers)	403km	263km	881km
Lead time (days)	2 days	2.7 days	4 days
Cost (US$)	518US$	1778US$	1838US$
Import time and cost / Land supply chain			
Distance (kilometers)	206km	223km	701km
Lead time (days)	3 days	3.3 days	4.6 days
Cost (US$)	579US$	1615US$	2003US$
Shipments meeting quality criteria (%)	67.45%	67.5%	71.35%
Number of agencies - exports	3	3.7	4
Number of agencies - imports	3	3.7	4.2
Number of documents - exports	4	4	3.8
Number of documents - imports	4	4.5	4.5
Clearance time without physical inspection (days)	1 days	1.7 days	2 days
Clearance time with physical inspection (days)	2 days	3.2 days	3.4 days
Physical inspection (%)	21.55%	23.76%	33.34%
Multiple inspection (%)	8.13%	7.29%	7.11%

Source: World Bank 2014

TABLE 6.4 DOMESTIC LPI: PERFORMANCE COMPARISON OF INDIA WITH TOP PERFORMERS 2014 (GERMANY, NETHERLANDS)

	India	Germany	Netherlands
Export time and cost / Port or airport supply chain			
Distance (kilometers)	384km	282km	111km
Lead time (days)	2 days	1 days	1 days
Cost (US$)	492US$	675US$	530US$
Export time and cost / Land supply chain			
Distance (kilometers)	199km	367km	199km
Lead time (days)	2 days	2 days	1 days
Cost (US$)	430US$	1129US$	447US$
Import time and cost / Port or airport supply chain			
Distance (kilometers)	403km	455km	160km
Lead time (days)	2 days	2 days	2 days
Cost (US$)	518US$	892US$	554US$
Import time and cost / Land supply chain			
Distance (kilometers)	206km	1030km	164km
Lead time (days)	3 days	3 days	1 days
Cost (US$)	579US$	1326US$	419US$
Shipments meeting quality criteria (%)	67.45%	76.02%	94.15%
Number of agencies - exports	3	3	1
Number of agencies - imports	3	3	2
Number of documents - exports	4	4	1
Number of documents - imports	4	4	2
Clearance time without physical inspection (days)	1 days	1 days	0 days
Clearance time with physical inspection (days)	2 days	1 days	1 days
Physical inspection (%)	21.55%	3.27%	2.83%
Multiple inspection (%)	8.13%	3.07%	1.57%

Source: World Bank 2014

The above table (6.4) compares India's logistics performance with that of LPI 2014 top performers like Germany and Netherlands

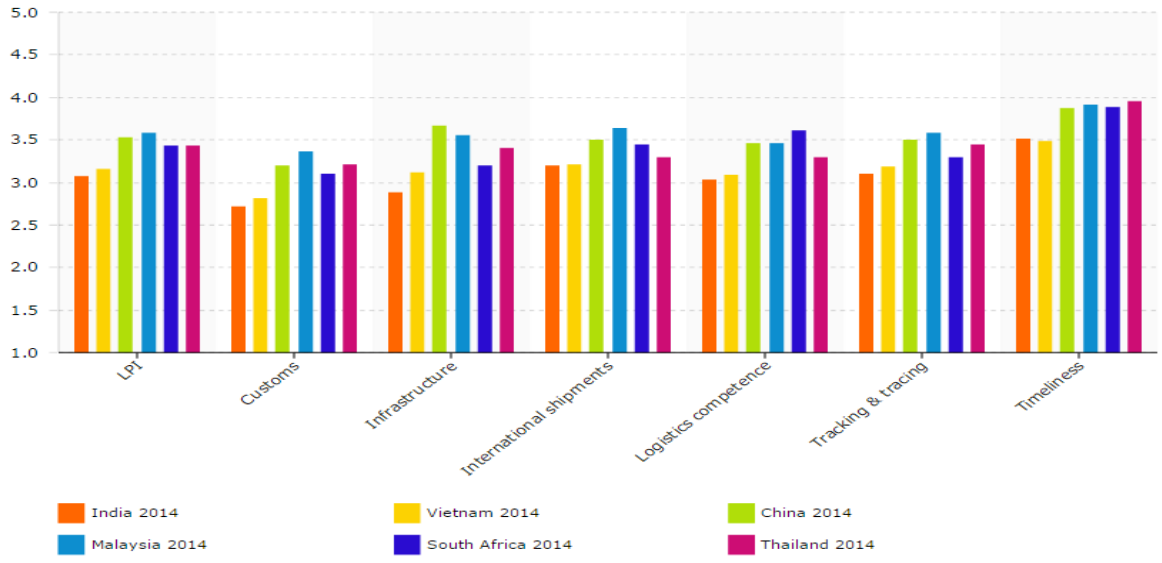
TABLE 6.5 TRADE LOGISTIC PERFORMANCE COMPARISON OF INDIA WITH SELECT COUNTRIES

Countries	Particulars	Customs	Infrastructure	International Shipments	Logistics, Quality & Competence	Tracking & Tracing	Timeliness
India	**Rank**	**65**	**58**	**44**	**52**	**57**	**51**
	Score	**2.72**	**2.88**	**3.2**	**3.03**	**3.11**	**3.51**
China	Rank	38	23	22	35	29	36
	Score	3.21	3.67	3.5	3.46	3.5	3.87
Malaysia	Rank	27	26	10	32	23	31
	Score	3.37	3.56	3.64	3.47	3.58	3.92
South Africa	Rank	42	38	25	24	41	33
	Score	3.11	3.2	3.45	3.62	3.3	3.88
Thailand	Rank	36	30	39	38	33	29
	Score	3.21	3.4	3.3	3.29	3.45	3.96
Vietnam	Rank	61	44	42	49	48	56
	Score	2.81	3.11	3.22	3.09	3.19	3.49

Source: PHD Research Bureau, compiled from World Bank

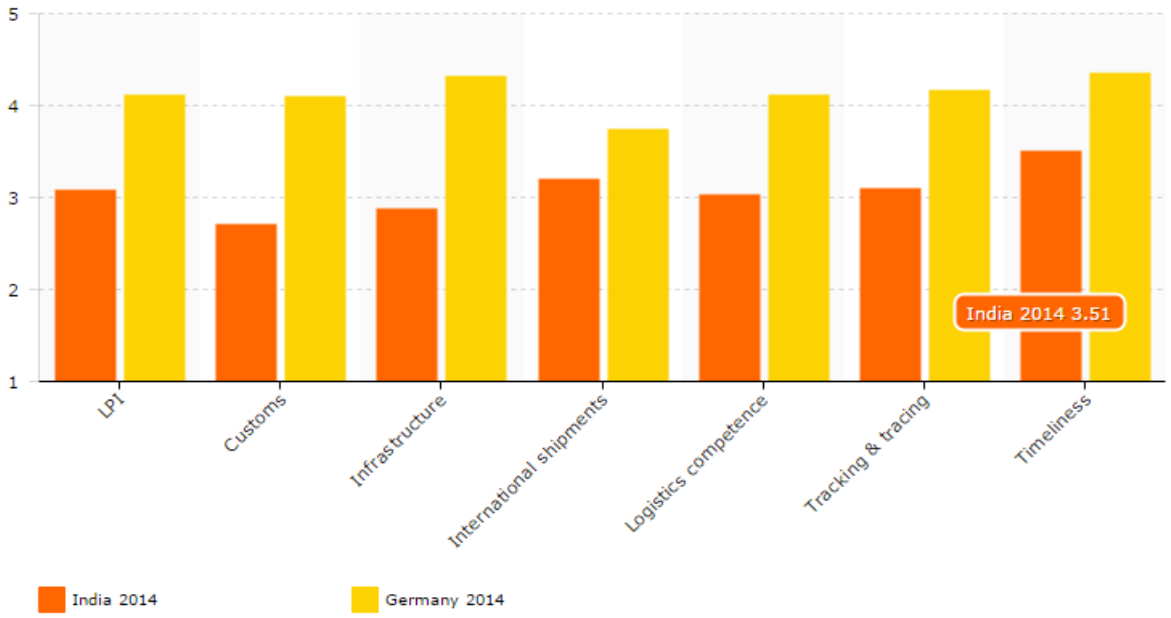
Compared to countries like China, Thailand, Malaysia and Vietnam, India fares way below all of them in terms of logistics performance. (Table 6.5).

Figure 6.2 India compared with other Asian countries



Source: World Bank, 2014

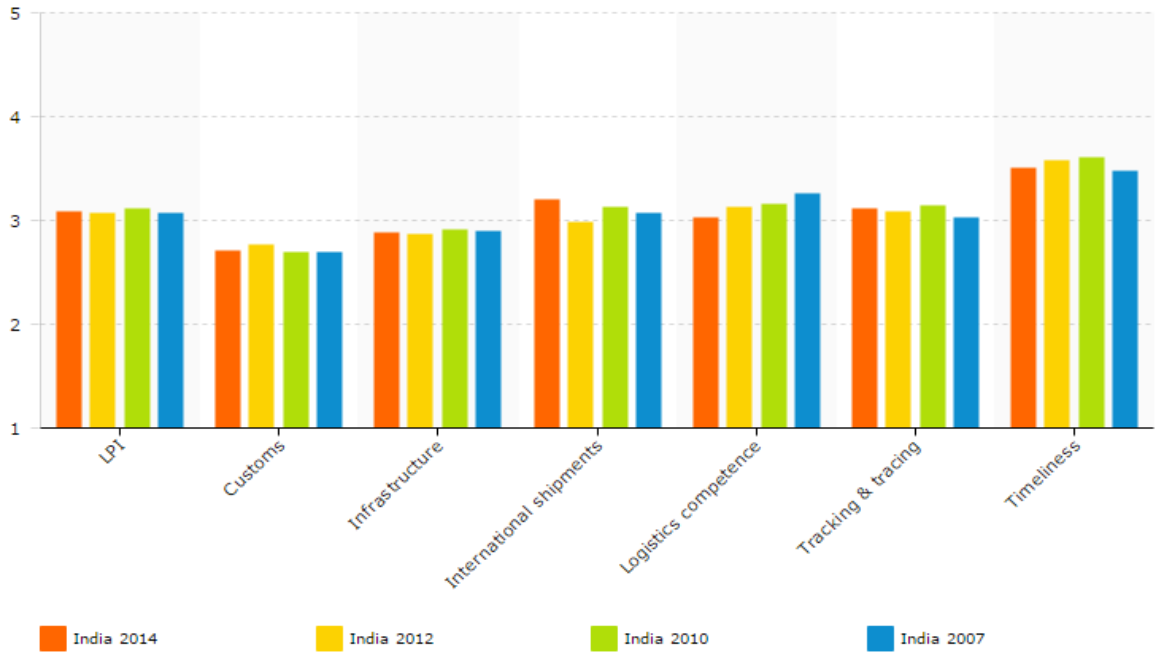
Figure 6.3 India against top performer in 2014 (Germany)



Source: World Bank (2014)

The above chart (Figure 6.3) shows the LPI scores of India and Germany (ranked No.1) along various dimensions.

Figure 6.4 India's performance across 4 years (2007, 2010, 2012 and 2014)



Source: World Bank

The above chart (Figure 6.4) shows that not much change is observed in India's logistics performance over the years. Logistics competence and timeliness are two areas of concern as they show a decreasing trend and India has improved in International shipments.

TABLE 6.6 INDIA'S LPI SCORES ACROSS 4 YEARS (2007, 2010, 2012, 2014)

Country	Year	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
India	2010	3.12	2.7	2.91	3.13	3.16	3.14	3.61
	2014	3.08	2.72	2.88	3.2	3.03	3.11	3.51
	2012	3.08	2.77	2.87	2.98	3.14	3.09	3.58
	2007	3.07	2.69	2.9	3.08	3.27	3.03	3.47

7. Findings and Recommendations

The competitive environment and global supply chain provide several insights that affect the overall logistics performance.

First, from a theoretical perspective, this paper bringing some relevant information and interesting knowledge of logistics performance in India. However, there is poor awareness among leaders about logistics performance, especially on the components, measurements and World Bank report of Logistics Performance Index (LPI). It is observed that Low- and lower middle-income countries like India have progressed the fastest in areas like customs and infrastructure .

If India has to be more competitive, they should encourage the development of third-party logistics functions, including those in the service sectors. To ensure that services are efficient and competitive, governments will need to make long-term policy changes that improve and maintain competitiveness of services, including logistics services that allow their countries to join global supply chains. A country like India could also benefit greatly by adopting more of "green logistics" practices.

8. CONCLUSION

The international LPI combines data on six core performance components into a single aggregate measure. Logistics Performance Index, developed by the World Bank, can analyze country performance in four major determinants of overall logistics performance: infrastructure, services, border procedures and time, and supply chain reliability.

This paper shows that, in spite of the fact that logistics became much more important than in the past, for most countries and organisations, there are still not many tools available and widely spread to measure its effectiveness. Based on that, it was justifiable to carry out exploratory research on a benchmarking tool that is quickly gaining importance among many high, middle and low income economies.

REFERENCES

Arvis, J.-F., Mustra, M.A., Ojala, L., Shepherd, B. and Saslavsky, D. (2014), Connecting to Compete 2014 – Trade Logistics in the Global Economy, Publications of the World Bank, USA.

Forrest, J., 2013, 'Achieving a Competitive Advantage Through Logistics Performance', Report, Supply Chain&Logistics Institute, Georgia Tech.

Founou, R., 2002 'The Role of IT in Logistics, Competitive Advantage or Strategic Necessity?', 2nd Swiss Transport Research Conference, Ascona, March 20-22, pp. 1-21.

Sandberg, E. &Abrahamson, M.,2011 'Logistics Capabilities for Sustainable Competitive Advantage', International Journal of Logistics, 14, 61-75.

Tongzon, J., 2004'Determinants of Competitiveness in Logistics: Implications for the Region', International Conference on Competitiveness: Challenges and Opportunities for Asian Countries, Thailand, July 1-2, pp. 1-16.

Vallee, F. & Dircksen, M., 2011, 'Extended Logistical Factors for Success in International Trade', World Customs Journal, 5(2), 1-94.

World Bank n.d. Logistics performance index: Overall (1=low to 5=high), viewed 01 Jan 2014, from http://data.worldbank.org/indicator/LP.LPI.OVRL.XQ/countries?display=default

World Bank . (2014, Jan 1). *Logistics Performance Index.* Retrieved From the World Bank website : http://www.lpi.worldbank.org

WTO, 2012, 'Connecting to Compete-Trade Logistics in the Global Economy, The Logistics Performance Index and Its Indicators', Trade Report, Washington.

WTO, 2014, 'Connecting to Compete-Trade Logistics in the Global Economy, The Logistics Performance Index and Its Indicators', Trade Report, Washington.