

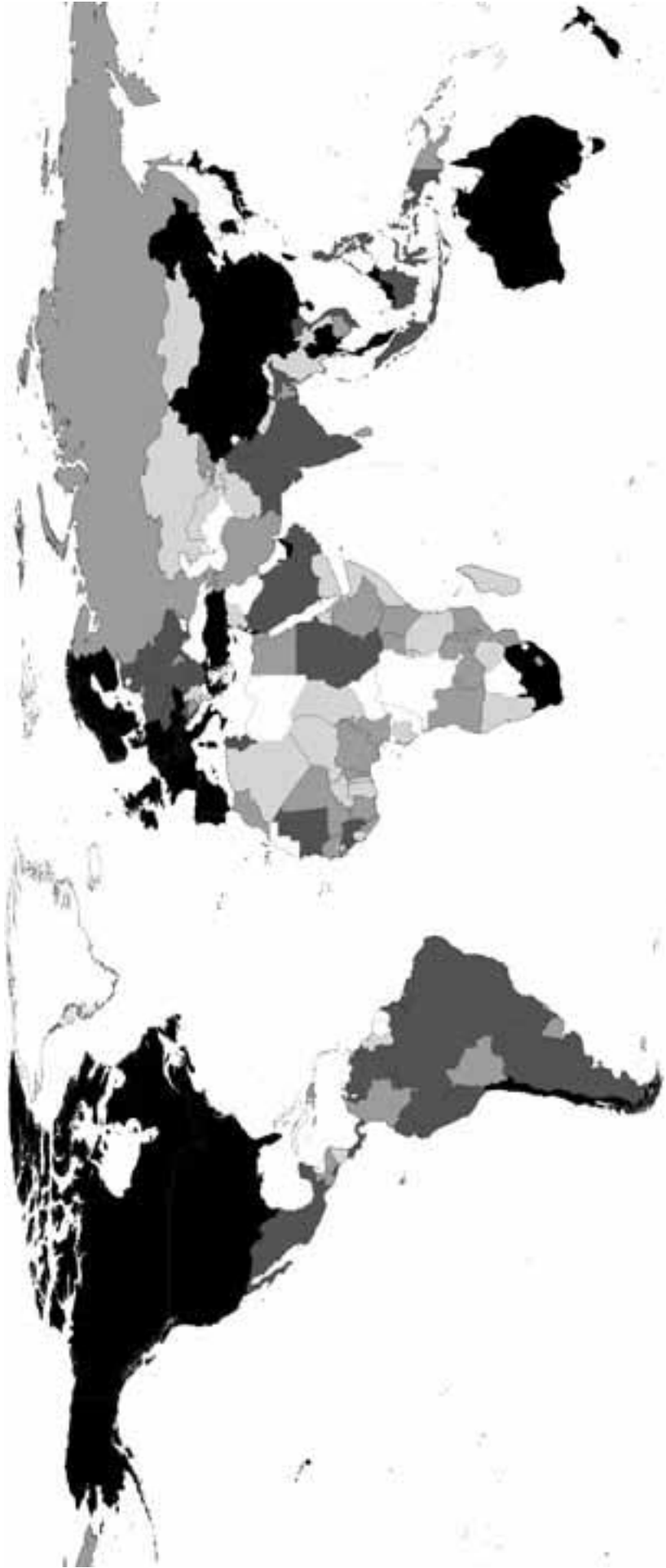
Connecting to Compete

2007

Trade Logistics in the Global Economy



The Logistics Performance Index and Its Indicators



■ LPI 1–2.29
■ LPI 2.53–3.14
□ No data

■ LPI 2.29–2.53
■ LPI 3.14–5

1 is the lowest score; 5 is the highest score.

Connecting to Compete

Trade Logistics in the Global Economy

The Logistics Performance Index and Its Indicators

Jean-François Arvis
The World Bank

Monica Alina Mustra
The World Bank

John Panzer
The World Bank

Lauri Ojala
Turku School of Economics

Tapio Naula
Turku School of Economics

© 2007 The International Bank for Reconstruction and Development / The World Bank
1818 H Street NW
Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org
E-mail: feedback@worldbank.org

All rights reserved

The findings, interpretations, and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the Executive Directors of the International Bank for Reconstruction and Development / The World Bank or the governments they represent.

The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this publication is copyrighted. Copying and/or transmitting portions or all of this work without permission may be a violation of applicable law. The International Bank for Reconstruction and Development/The World Bank encourages dissemination of its work and will normally grant permission to reproduce portions of the work promptly.

For permission to photocopy or reprint any part of this work, please send a request with complete information to the Copyright Clearance Center Inc., 222 Rosewood Drive, Danvers, MA 01923, USA; telephone: 978-750-8400; fax: 978-750-4470; Internet: www.copyright.com.

If you have any questions or comments about this report, please contact:

International Trade Department
The World Bank
1818 H Street NW, Room MSN MC2-201, Washington, DC 20433 USA
Telephone: 202-473-8922
E-mail: tradefacilitation@worldbank.org
Web site: www.worldbank.org or www.worldbank.org/lpi

All other queries on rights and licenses, including subsidiary rights, should be addressed to the Office of the Publisher, The World Bank, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2422; e-mail: pubrights@worldbank.org.

Foreword

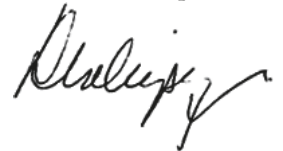
Technological progress and worldwide trade and investment liberalization are presenting new opportunities for countries to harness global markets for growth and poverty reduction. But with the advent of global supply chains, a new premium is being placed on being able to move goods from A to B rapidly, reliably, and cheaply. Being able to connect to what has been referred to as the “physical internet” is fast becoming a key determinant of a country’s competitiveness. For those able to connect, the physical internet brings access to vast new markets; but for those whose links to the global logistics web are weak, the costs of exclusion are large and growing. Whether a cause or a consequence, no country has grown successfully without a large expansion of its trade.

This report aims to shed light on how different countries are doing in the area of trade logistics, and what they can do to improve their performance. It is based on a worldwide survey of the global freight forwarders and express carriers who are the most active in international trade. The Logistics Performance Index (LPI) and its underlying indicators constitute a unique dataset to measure country performance across several dimensions of logistics and to benchmark that logistics performance against 150 countries. It provides the empirical basis to understand and compare differences in trade logistics as well as to inform policy with respect to difficult bottlenecks and tradeoffs. As a tool for policymakers, professionals, development agencies, and other stakeholders, it will directly support the fast-growing agenda for

reforms and investments in trade and transport facilitation.

The report provides some insights on the cost of poor logistics to country competitiveness—and the sources of those higher costs. Beyond cost and time taken to deliver goods, the predictability and reliability of supply chains is increasingly important in a world of just-in-time production sharing. Costs related to hedging against uncertainty are significant. Equally, cost and quality of logistics are determined not just by infrastructure and the performance of public agencies, but also by the availability of quality and competitive private services. Moreover, in many developing countries, problems of adverse geography are compounded by a weak modern services sector due to poor institutions or over-regulation. The report closes with some practical insights, advocating a comprehensive, integrated approach to ensure that actions in one area are not rendered ineffective by bottlenecks in another.

We hope that this initiative will be a valuable addition to the set of tools the World Bank provides to enable countries to assess and benchmark their performance in this critical area, and that it will, in a modest way, promote growth, poverty reduction, and economic development.



Danny Leipziger
Vice President and Head of Network
Poverty Reduction and Economic management

Acknowledgments

The survey would not have been possible without the support and participation of the International Federation of Freight Forwarders Associations (www.fiata.com), the Global Express Association (www.global-express.org), the Global Facilitation Partnership for Transportation and Trade (www.gfpptt.org), and ten major international logistics companies. The survey was designed and implemented with Finland's Turku School of Economics (www.tukkk.fi/english/), which worked with the Bank to develop the concept in 2003.

This is the first report presenting the Logistics Performance Index (LPI) and indicators. The survey will be conducted each year to improve the reliability of the indicators and to build a dataset comparable across countries and over time.

The authors express their gratitude to the hundreds of employees of freight forwarding and express carrier companies around the world who took the time to respond to the survey. Their participation was central to the quality and credibility of the project, and their continuing involvement and feedback will be essential as we develop and refine the survey and the LPI in future years.

Authors



This report has been prepared under the leadership of Jean-François Arvis, Monica Alina Mustra, and John Panzer (sector manager) with a core team of external partners, including Lauri Ojala and Tapio Naula. Additional contributions were made by Julia Nielson (including help in drafting parts of the report) and Jean Pierre Chaffour. Liliya Repa contributed to the data analysis and the data appendix.

Several reviewers offered extensive advice and comments throughout the conceptualization stages. These included Aart Kray, Robin Carruthers, and Najy Benhassine. Extensive and excellent advice was received from Marc Juhel, Antonio Estache, Gerard McLinden, Peter Walkenhorst, Simeon Djankov, and Mariem Malouche.

The accompanying LPI website was produced by the World Bank Institute Multimedia Team which included Steffen Soulejman Janus, Arseny Malov, and under the guidance of Monica Alina Mustra.

Communications Development Incorporated provided overall design, editing, and layout, led by Bruce Ross-Larson, Laura Peterson Nussbaum, and Amye Kenall. Elaine Wilson created the graphics and typeset the book. Peter Grundy, of Peter Grundy Art & Design, provided the cover design. Monica Alina Mustra managed the publication process and the dissemination activities.

The work was conducted under the general guidance of Uri Dadush.

Table of contents

Foreword	iii
Acknowledgments	iv
Authors	v
Executive summary	1
Overview: Connecting to compete	3
Measuring logistics performance	7
The Logistics Performance Index and its indicators	8
Assessing the performance gap	8
Overachievers and underachievers: Examples of the logistics gap	9
The LPI gap, trade, and FDI: Good logistics performers benefit more from globalization	11
Key factors in logistics performance	13
Factors determining logistics performance	13
Logistics and competitiveness: Why predictability and reliability matter more than costs	16
Lessons for reform	18
Reforms must be comprehensive	18
Some areas of reform are tackled more than others	19
Implementing reform is not easy	19
While integrated reforms are essential, priorities and strategies may differ	19

Technical notes

Technical note 1: Selection of countries	22
Technical note 2: The Logistics Performance Index and multivariate regressions	23

Boxes

Box 1.1	The LPI and other international indicators	7
Box 1.2	Building the Logistics Performance Index	8
Box 1.3	How precise is the LPI estimate?	9
Box 2.1	Modernizing border processes	15
Box 2.2	Delivering on schedule	15

Figures

Figure 1.1	High income countries are generally top performers, but there are big differences between countries at other income levels	9
Figure 1.2	Performance of selected middle income countries	10
Figure 1.3	Performance of selected low income countries	11
Figure 1.4	Logistics performance is associated with the diversification of exports, 2005	11
Figure 1.5	Trade expansion of non-oil-exporting developing countries and logistics performance, 1992–2005	12
Figure 2.1	Structure of logistics costs supported by traders	16
Figure 2.2	Direct freight costs versus induced costs assessed by respondent	16
Figure 3.1	High performers are consistent performers: Discrepancies across factors of performance	18
Figure 3.2	Vicious and virtuous logistics	20
Figure 3.3	Logistics typology	21

Tables

Table 1	The first Logistics Performance Index	2
Table 1.1	Top 10 countries, by income group	10
Table 2.1	How logistics professionals assess institutions and processes	13
Table 3.1	Percent of respondents acknowledging positive trends in developments for the following areas, during the last three years	19
Table 3.2	Identify the severity of constraints to overall performance	21
Technical note table 1.1	Six country selection rules	22
Technical note table 1.2	Regional coverage of the Logistics Performance Index	22
Technical note table 2.1		23

Appendix tables

Table A1	Country rankings on the Logistics Performance Index and indicators	26
Table A2	Country-specific environment and institutions data averages, by income group and region	34
Table A3	Country-specific performance data, by country	36

Executive summary

Connecting to compete—trade logistics in the global economy—is critical for developing countries to harness global trade and reap the benefits of globalization. Success in integrating global supply chains starts with the ability of firms to move goods across borders rapidly, reliably, and cheaply.

The Logistics Performance Index (LPI) and its indicators provide the first in-depth cross-country assessment of the logistics gap among countries. Drawing on the first-hand knowledge of logistics professionals worldwide, it provides a comprehensive picture of supply chain performance—from customs procedures, logistics costs, and infrastructure quality to the ability to track and trace shipments, timeliness in reaching destination, and the competence of the domestic logistics industry.

Using a 5-point scale, the LPI aggregates more than 5,000 country evaluations. It is complemented by a number of qualitative and quantitative indicators of the domestic logistics environment, institutions, and performance of supply chains (such as costs and delays).

The LPI and its indicators point to significant differences in logistics performance across countries and regions. It reflects not only expected disparities between developed and developing countries, especially the least-developed, landlocked countries, but more important, significant differences among developing countries at similar levels of development. Countries that top the LPI ranking are typically key players in the logistics industry, while those at the bottom are often trapped in a vicious circle of overregulation, poor quality services, and underinvestment. Among developing countries, logistics overachievers are also those experiencing economic growth led by manufactured exports.

A key insight from the survey of logistics professionals is that, while costs and timeliness are of paramount importance, traders are primarily concerned with the overall reliability of the supply chain. Costs related to hedging against uncertainty have become a significant part of logistics costs in many developing

countries. Country performance is largely influenced by the weakest link in the supply chain: poor performance in just one or two areas can have serious repercussions on overall competitiveness.

Although much progress has been made in telecommunications and information technology, most logistics professionals are not satisfied with the quality of the physical infrastructure in many developing countries. Even where customs has been modernized, the coordination of border procedures between customs and other agencies remains an important concern. Logistics performance is more and more determined by the availability of quality, competitive private services—such as trucking, customs brokering, and warehousing.

The LPI suggests that policymakers should look beyond the traditional “trade facilitation” agenda that focuses on road infrastructure and information technology in customs to also reform logistics services markets and reduce coordination failures, especially those of public agencies active in border control. This demands a more integrated, comprehensive approach to reforms all along the supply chain.

Indeed, there are strong synergies among reforms to customs, border management, infrastructure, and transport regulations because reforms usually reinforce each other. Countries performing well typically have a comprehensive approach that improves key factors in logistics performance in parallel, while countries with a piecemeal approach tend not to demonstrate lasting improvements.

In turn, cross-cutting reforms need to be supported by broad constituencies. International companies can bring global knowledge, but the support of local exporters, operators, and public agencies is crucial.

The LPI rankings and indicators provide robust benchmarks that may help build the case for reform. By shining a light on the costs of poor logistics performance, the LPI and its indicators can help countries break out of the vicious circle of logistics unfriendliness to effectively access global markets.

Table 1 The first Logistics Performance Index

Logistics Performance Index			Logistics Performance Index			Logistics Performance Index		
Country	Rank	Score	Country	Rank	Score	Country	Rank	Score
Singapore	1	4.19	Romania	51	2.91	Senegal	101	2.37
Netherlands	2	4.18	Jordan	52	2.89	Côte d'Ivoire	102	2.36
Germany	3	4.10	Vietnam	53	2.89	Kyrgyz Republic	103	2.35
Sweden	4	4.08	Panama	54	2.89	Ethiopia	104	2.33
Austria	5	4.06	Bulgaria	55	2.87	Liberia	105	2.31
Japan	6	4.02	Mexico	56	2.87	Moldova	106	2.31
Switzerland	7	4.02	São Tomé and Príncipe	57	2.86	Bolivia	107	2.31
Hong Kong, China	8	4.00	Lithuania	58	2.78	Lesotho	108	2.30
United Kingdom	9	3.99	Peru	59	2.77	Mali	109	2.29
Canada	10	3.92	Tunisia	60	2.76	Mozambique	110	2.29
Ireland	11	3.91	Brazil	61	2.75	Azerbaijan	111	2.29
Belgium	12	3.89	Guinea	62	2.71	Yemen, Rep.	112	2.29
Denmark	13	3.86	Croatia	63	2.71	Burundi	113	2.29
United States	14	3.84	Sudan	64	2.71	Zimbabwe	114	2.29
Finland	15	3.82	Philippines	65	2.69	Serbia and Montenegro	115	2.28
Norway	16	3.81	El Salvador	66	2.66	Guinea-Bissau	116	2.28
Australia	17	3.79	Mauritania	67	2.63	Lao PDR	117	2.25
France	18	3.76	Pakistan	68	2.62	Jamaica	118	2.25
New Zealand	19	3.75	Venezuela, RB	69	2.62	Togo	119	2.25
United Arab Emirates	20	3.73	Ecuador	70	2.60	Madagascar	120	2.24
Taiwan, China	21	3.64	Paraguay	71	2.57	Burkina Faso	121	2.24
Italy	22	3.58	Costa Rica	72	2.55	Nicaragua	122	2.21
Luxembourg	23	3.54	Ukraine	73	2.55	Haiti	123	2.21
South Africa	24	3.53	Belarus	74	2.53	Eritrea	124	2.19
Korea, Rep.	25	3.52	Guatemala	75	2.53	Ghana	125	2.16
Spain	26	3.52	Kenya	76	2.52	Namibia	126	2.16
Malaysia	27	3.48	Gambia, The	77	2.52	Somalia	127	2.16
Portugal	28	3.38	Iran, Islamic Rep.	78	2.51	Bhutan	128	2.16
Greece	29	3.36	Uruguay	79	2.51	Uzbekistan	129	2.16
China	30	3.32	Honduras	80	2.50	Nepal	130	2.14
Thailand	31	3.31	Cambodia	81	2.50	Armenia	131	2.14
Chile	32	3.25	Colombia	82	2.50	Mauritius	132	2.13
Israel	33	3.21	Uganda	83	2.49	Kazakhstan	133	2.12
Turkey	34	3.15	Cameroon	84	2.49	Gabon	134	2.10
Hungary	35	3.15	Comoros	85	2.48	Syrian Arab Republic	135	2.09
Bahrain	36	3.15	Angola	86	2.48	Mongolia	136	2.08
Slovenia	37	3.14	Bangladesh	87	2.47	Tanzania	137	2.08
Czech Republic	38	3.13	Bosnia and Herzegovina	88	2.46	Solomon Islands	138	2.08
India	39	3.07	Benin	89	2.45	Albania	139	2.08
Poland	40	3.04	Macedonia, FYR	90	2.43	Algeria	140	2.06
Saudi Arabia	41	3.02	Malawi	91	2.42	Guyana	141	2.05
Latvia	42	3.02	Sri Lanka	92	2.40	Chad	142	1.98
Indonesia	43	3.01	Nigeria	93	2.40	Niger	143	1.97
Kuwait	44	2.99	Morocco	94	2.38	Sierra Leone	144	1.95
Argentina	45	2.98	Papua New Guinea	95	2.38	Djibouti	145	1.94
Qatar	46	2.98	Dominican Republic	96	2.38	Tajikistan	146	1.93
Estonia	47	2.95	Egypt, Arab Rep.	97	2.37	Myanmar	147	1.86
Oman	48	2.92	Lebanon	98	2.37	Rwanda	148	1.77
Cyprus	49	2.92	Russian Federation	99	2.37	Timor-Leste	149	1.71
Slovak Republic	50	2.92	Zambia	100	2.37	Afghanistan	150	1.21

Overview: Connecting to compete

High logistics costs and—more particularly—low levels of service are a barrier to trade and foreign direct investment—and thus to economic growth

The increase in global production sharing, the shortening of product life cycles, and the intensification of global competition all highlight logistics as a strategic source of competitive advantage. Since the advent of modern trade several centuries ago, the international movement of goods has been primarily organized by freight forwarders, typically large networks of companies with worldwide coverage, capable of handling and coordinating the diverse actions required to move goods across long distances and international borders. More recently, the rise of express carriers and third-party logistics providers has expanded the scope of services available to traders. Freight forwarders and express carriers are at the heart of the present wave of globalization: they facilitate an ever-more demanding system that connects firms, suppliers, and consumers on what *The Economist* characterizes as “the physical internet.”¹ The physical internet is global, but the ability of countries to access it depends on the quality of their national infrastructure as well as the effectiveness of their policies and institutions.

Technological advances and economic liberalization have created new opportunities for countries to harness global markets for economic growth and development. But expanded supply chains and global production networks put a new premium on moving goods in a predictable, timely, and cost-effective way. Well connected countries can have access to many more markets and consumers: a country as distant from most major markets as Chile can be a major player in the high-end world food market, supplying fresh fish and perishable fruits to consumers in Asia, Europe, and North America. But for the poorly connected, the costs of exclusion are considerable and growing, and the risks of missed opportunities loom large, especially

for the poorest landlocked countries, many of them in Africa.

In this highly competitive world, the quality of logistics can have a major bearing on a firm’s decisions about which country to locate in, which suppliers to buy from, and which consumer markets to enter. High logistics costs and—more particularly—low levels of service are a barrier to trade and foreign direct investment and thus to economic growth. Countries with higher overall logistics costs are more likely to miss the opportunities of globalization.

Take landlocked Chad. Importing a 20-foot container from Shanghai to its capital N’jamena takes about ten weeks at a cost of \$6,500. Importing the same container to a landlocked country in western or central Europe would take about four weeks and cost less than \$3,000. The shipping costs and delays from Shanghai to Douala, the gateway for Chad, and to West European ports are essentially the same. And the same international freight forwarding company would handle the container from Douala to N’jamena and within Europe. But what accounts for the large difference in time and cost?

The answer lies in better processes, higher quality services, and the operating environment. The forwarder in Europe would use a seamless, paperless system to manage the inland shipment from its eight-hectare campus in the gateway port of Le Havre. The transport inside Europe would take less than three days. And to add value for its client and generate more business, the forwarder would provide additional services, such as improving the client’s internal distribution practices.

In Chad the process would be different. While only five days should be needed to move the container from Douala to N’jamena, the

The LPI suggests that there are strong synergies among reforms to customs, border management, infrastructure, and transport regulations

actual time would likely be as long as five weeks. In a difficult governance and security environment, the freight forwarding company would be trying simply to avoid a breakdown in its client's supply chain. It would maintain company staff along the trade corridor to physically track the goods and trade documents. And it would have to be ready to mediate with the trucking syndicate, the security forces, and myriad government agencies.

Freight forwarders and express carriers are in a privileged position to assess how countries perform on logistics. They manage operations from factory and warehouse to port, from port to overland transit, and through one or more borders to destination, with each link testing a country's logistics infrastructure performance. The logistics performance survey taps the first-hand knowledge of the operational staff of logistics companies worldwide.

Complementing existing international sets of competitiveness indicators—such as the World Bank's *Doing Business* measures and the World Economic Forum's *Global Competitiveness Index*—the Logistics Performance Index and its indicators propose a comprehensive approach to supply chain performance. It provides the first in-depth cross-country assessment of the logistics gap and constraints facing countries. It elaborates on several areas of performance, such as trade procedures, infrastructure, services, and reliability. Based on a 1 to 5 scale (lowest to highest performance), it aggregates more than 5,000 country evaluations by professionals trading with the country on various dimensions of performance. These evaluations, by individuals located outside the country being evaluated, are used to compute the Logistics Performance Index (LPI) and its underlying indicators (table 1 and appendix table A1).

In addition to the LPI, for each country, the survey combines qualitative and quantitative assessments of the domestic logistics environment, institutions, and performance of domestic supply chains (costs, delays) by international professionals located in the country evaluated (appendix tables A2 and A3). This additional information is used to reinforce and interpret the results of the LPI and underlines the major

messages about priorities for reform and effective ways of reforming.

The LPI and its indicators underscore significant differences in logistics performance across countries and regions. These differences reflect the disparities between developed and emerging economies (such as Singapore, which ranks first) and other developing countries, especially the least-developed or landlocked countries (Afghanistan ranks last). Countries that top the LPI rankings are typically hubs and/or key players in the logistics industry.

While performance outcomes such as domestic costs or the time taken to reach a destination are important, traders mostly value the performance of logistics services available to them: reliability and predictability of the supply chain matter most. For example, traditional measures of performance such as direct freight costs and average delays, while important, may not capture the overall logistics performance and thus the ability of countries to use trade for growth. The predictability and reliability of shipments, while more difficult to measure, are more important for firms and may have a more dramatic impact on their ability to compete.

Indeed, professionals view the friendliness of border processes primarily in terms of the transparency and the predictability of clearance procedures. Even where countries have already implemented a customs modernization program, the coordination of border procedures between customs and other agencies (responsible say, for sanitary and phytosanitary standards) is an important concern. The availability and competence of trucking, customs brokering, and warehousing services are also critical performance factors that vary widely across countries. While telecommunications and information technology infrastructure, increasingly the key to successful trade operations, have improved rapidly in most countries, most professionals remain concerned about the quality of physical infrastructure.

In terms of the way forward, the LPI suggests that there are strong synergies among reforms to customs, border management, infrastructure, and transport regulations. Reforms in these different areas have a mutually

reinforcing effect along all links in the logistics supply chain, directly contributing to predictability and performance. Countries performing well have a comprehensive approach, improving all the key logistics in parallel, while those with a piecemeal approach, targeting a single link in the logistics chain, may see initial results but no lasting improvements. A comprehensive reform of logistics and trade facilitation is thus essential. But too few developing countries have created a virtuous circle of improvements. Countries at the bottom of the LPI ranking are typically trapped in a vicious circle of overregulation, poor quality services, and underinvestment.

The LPI suggests that policymakers should look beyond the traditional “facilitation agenda” focused on trade-related infrastructure and information technology in customs. To close the logistics gap, they should also look to reforms in the markets for logistics services, reduce coordination failures (especially those of public agencies active in border control), and build strong domestic constituencies to support reform. This effort will demand a more integrated, comprehensive approach to reforms all along the supply chain. For the most severely constrained countries—typically landlocked countries in Africa and Central Asia—innovative solutions may need to be found, and international donors will have an important role.

The LPI rankings and indicators provide robust benchmarks that may help policymakers—and particularly the private sector—build the

case for reform. By showing countries how they compare with their competitors, and shining a light on the costs of poor logistics performance, it is hoped that the LPI and its indicators may help countries break out of the vicious circle of “logistics unfriendliness”. In identifying the key areas of problems and constraints, the LPI and its indicators also aim to help guide the preparation of the more in-depth, country-specific assessments and strategies, such as trade and transport facilitation audits (Raven 2001), that will be needed to generate concrete improvements in logistics performance.

Section 1 introduces the overall concept of the LPI and the methodology underlying its construction. It also presents examples that point to some of the critical factors behind a country’s logistics performance. It introduces a broad typology of country groups, revealing the large disparities in performance among countries at similar incomes. It examines this logistics gap and shows that good logistics performers experience greater and more diversified trade flows. Section 2 draws upon the qualitative information provided by international operators based in the countries being evaluated to provide insights on the key institutions and processes determining logistics performance and analyzes the importance of reliability in logistics performance for competitiveness. Section 3 offers some ideas on the way forward for policymakers and development agencies, setting priorities for comprehensive reforms according to the current level of performance.

Countries performing well have a comprehensive approach, improving all the key logistics in parallel, while those with a piecemeal approach, targeting a single link in the logistics chain, may see initial results but no lasting improvements

Measuring logistics performance

International logistics encompasses an array of actions, from transportation, consolidation of cargo, warehousing, and border clearance to in-country distribution and payment systems

Improving logistics performance has become an important development policy objective. The performance of customs, trade-related infrastructure, inland transit, logistics services, information systems, and port efficiency are all critical to whether countries can trade goods and services on time and at low cost. And this trade competitiveness is central to whether countries can harness globalization's new opportunities for development.

Governments, often at the urging of the private sector, are now ramping up projects to facilitate trade and transportation, supported by increased assistance from the World Bank and other development agencies. But the scarcity of performance indicators to benchmark and assess country logistics performance is making it difficult for policymakers and private sector stakeholders to quantify the constraints they face in connecting to global markets and also to inform and reinforce constituencies for reform.

International logistics encompasses an array of actions, from transportation, consolidation of cargo, warehousing, and border clearance to in-country distribution and payment systems.

This sequence cannot be easily summarized in a single indicator. Nor is it easy to collect on a global basis the information to build a performance measure. Information on time and costs associated with some important logistics processes—such as port time, time to clear customs, and transport—provides a good starting point and in many cases is readily available. But this information, even when complete, cannot be easily aggregated in a single consistent cross-country dataset because of essential differences in the supply chain structure among countries.

Perhaps more important, many critical elements for good logistics performance—such as the transparency of processes and the quality, predictability, and reliability of services—cannot be captured from the information available on time and costs. So the World Bank, with its professional and academic partners, has produced the (first) Logistics Performance Index (LPI) to start closing the knowledge gap and help countries develop logistics reform programs to enhance their competitiveness. The LPI complements existing measures of competitiveness (box 1.1).

Box 1.1

The LPI and other international indicators

The International Finance Corporation and the World Bank jointly maintain the *Doing Business* database. This major initiative provides objective measures of business regulations and enforcement (www.doingbusiness.org). *Doing Business 2008* presents quantitative indicators on business regulations and the protection of property rights that can be compared across 175 economies and over time.

For trade activities, *Doing Business* focuses on red tape obstacles to the movement of goods across borders and the ease of export and import for small and medium sized enterprises. It looks, for example, at the number of documents and signatures for imports and exports. The LPI uses a broader and comprehensive approach to supply-chain performance to measure some of the critical factors of trade logistics performance, including the quality of infrastructure and logistics services, the security of property from theft

and looting, the transparency of government procedures, macro-economic conditions, and the underlying strength of institutions.

The Global Competitiveness Index 2006–2007 (GCI), produced by World Economic Forum (www.weforum.org), is a composite index based on macro and micro data as well as interviews with key business and societal stakeholders featuring the 12 pillars of competitiveness. It contains detailed profiles of 125 economies and data tables with global rankings covering more than 100 indicators in nine areas: institutions, infrastructure, macroeconomy, health and primary education, higher education and training, market efficiency, technological readiness, business sophistication, and innovation. Several indicators are directly relevant to trade facilitation and logistics.

The added value of the LPI is that it provides a global benchmark of logistics efficiency and service quality not treated specifically in the GCI or in *Doing Business*.

The Logistics Performance Index and its indicators are based on a survey of multinational freight forwarders and express carriers—professionals whose views matter

The Logistics Performance Index and its indicators

The Logistics Performance Index and its indicators have been constructed from information gathered in a worldwide survey of the companies responsible for moving goods and facilitating trade around the world—the multinational freight forwarders and the main express carriers. It relies on the experience and knowledge of professionals. Their views matter: they have a direct impact on the choice of shipping routes and gateways and can influence the firms' decisions about the location of production, choice of suppliers and selection of target markets.

The indicators summarize the performance of countries in seven areas that capture the current logistics environment (box 1.2). They range from traditional areas such as customs procedures, logistics costs (such as freight rates), and infrastructure quality to new areas like the ability to track and trace shipments, timeliness in reaching a destination, and the competence of the domestic logistics industry. None of these areas alone can ensure good logistics performance. The selection of these areas is based on the latest theoretical and empirical research² and on extensive interviews with logistics

professionals involved in international freight logistics.³ The LPI synthesizes this information in a composite index to allow for comparisons (see appendix table A1).

The LPI and its indicators are given on a numerical scale, from 1 (worst) to 5 (best). This scale can also be used to interpret performance outcomes measures. For example, the analysis based on the additional country information gathered in the survey, indicates that, on average, having an LPI lower by one point (say, 2.5 rather than 3.5) implies six additional days for getting imports from the port to a firm's warehouse and three additional days for exports. It also implies that a shipment is five times more likely to be subject to a physical inspection at entry.

Assessing the performance gap

Countries that top the LPI rankings are major global transport and logistics hubs (Singapore) or the base for a strong logistics service industry (Switzerland). Logistics services in these countries tend to benefit from economies of scale and are often sources of innovation and technological change. The scores for the top performers are fairly close, yet in many cases the differences are statistically significant (box 1.3).

Box 1.2 Building the Logistics Performance Index

The Logistics Performance Index (LPI) is built on information from a web-based questionnaire completed by more than 800 logistics professionals worldwide—the operators or agents of the world's largest logistics service providers. Each respondent was asked to rate performance in seven logistics areas for eight countries with which they conduct business. For each respondent, the eight countries were automatically generated by the survey engine based on trade flows, income level, geographical position of respondent countries (coastal or landlocked), and random selection.⁴ The country selection matrix is presented in technical note 1. Performance was evaluated using a 5-point scale (1 for the lowest score, 5 for the highest).

The seven areas of performance are:⁵

- Efficiency of the clearance process by customs and other border agencies.
- Quality of transport and information technology infrastructure for logistics.
- Ease and affordability of arranging international shipments.

- Competence of the local logistics industry.
- Ability to track and trace international shipments.
- Domestic logistics costs.
- Timeliness of shipments in reaching destination.

More than 5,000 individual country evaluations were used to prepare the Logistics Performance Index, which covers 150 countries (see appendix table A1). The LPI was aggregated as a weighted average of the seven areas of logistics performance.⁶ The index is constructed using the Principal Component Analysis method in order to improve the confidence intervals.

Each respondent was also asked to evaluate the logistics performance and the environment and institutions in support of logistics operations in the country in which they are based (appendix table A2) and to provide time and cost data (appendix table A3). This wealth of additional information on different aspects of logistics was used to interpret the LPI as well as validate and cross-check the information underlying the LPI. The questionnaire is available at www.worldbank.org/lpi.

Box 1.3

How precise is the LPI estimate?

The LPI is a robust combination of the various dimensions from the international assessments, built by standard econometric techniques to maximize significance and improve confidence intervals, which are computed at a 10 percent level. The average confidence interval on the 1–5 scale is 0.16, the equivalent of eight places in the LPI ranking. These calculated intervals are larger for small markets that have few respondents. For instance, Mauritius has a surprisingly low ranking (137), but a wide confidence interval of 0.25. An upper-range reading of its index would give it the same ranking as Sri Lanka (97).

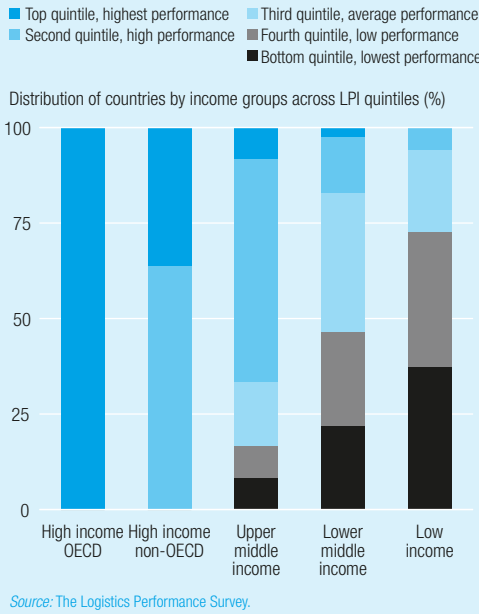
At the other extreme are low-income countries, often landlocked and geographically isolated, or countries afflicted by conflict or severe governance problems. Landlocked developing countries, especially in Africa and Central Asia, are the most logistically constrained. They typically suffer not only from geographical disadvantages resulting in high transport costs and delays but also from limited access to competitive markets for logistics services and dependence upon the performance of other transit countries.

While all developed countries are top performers, there are significant differences among developing countries at similar incomes (figure 1.1). For example, China—a middle income country—ranks 30th of 150, while countries in higher income groups, such as oil producers, perform below their potential. Moreover, countries doing fairly well in logistics are also likely to do well in growth and competitiveness, export diversification, and trade expansion, as discussed further below.

For developing countries where trade has been an important factor in accelerating growth, logistics performance is also significantly better than in other countries at similar incomes. Examples include South Africa (24), Malaysia (27), Chile (32), and Turkey (34) among the upper middle income countries; China (30) and Thailand (31) among the lower middle income; and India (39) and Vietnam (53) among the low income (table 1.1).

Figure 1.1

High income countries are generally top performers, but there are big differences between countries at other income levels



Many of the oil exporting countries tend to underperform logistically

Overachievers and underachievers: Examples of the logistics gap

Performance is assessed against comparable countries, notably those at similar levels of development (figures 1.2 and 1.3). Overachievers and underachievers can be identified by whether they exhibit a positive or negative LPI gap compared with their potential, extrapolated from their level of development (gross national income per capita).

Many of the oil exporting countries tend to underperform logistically. Algeria (140) lags significantly behind its neighbors Tunisia (60) and Morocco (94). The same applies to Bahrain (36), Saudi Arabia (41), Kuwait (44), and Qatar (46), which underperform relative to the rest of the high income group. One reason for this may be the relative absence in these countries of incentives and pressure from the private sector to implement institutional reforms for trade and transport—reflecting the dominance of oil in their exports. By contrast, for some emerging economies where export-oriented manufacturing has been a major factor in growth, the private sector has been a prime proponent of logistics reforms.

Table 1.1 Top 10 countries, by income group

Top 10 countries Upper middle income			Top 10 countries Lower middle income			Top 10 countries Low income		
Country	Logistics Performance Index		Country	Logistics Performance Index		Country	Logistics Performance Index	
	Rank	Score		Rank	Score		Rank	Score
South Africa	24	3.53	China	30	3.32	India	39	3.07
Malaysia	27	3.48	Thailand	31	3.31	Vietnam	53	2.89
Chile	32	3.25	Indonesia	43	3.01	São Tomé and Príncipe	57	2.86
Turkey	34	3.15	Jordan	52	2.89	Guinea	62	2.71
Hungary	35	3.15	Bulgaria	55	2.87	Sudan	64	2.71
Czech Republic	38	3.13	Peru	59	2.77	Mauritania	67	2.63
Poland	40	3.04	Tunisia	60	2.76	Pakistan	68	2.62
Latvia	42	3.02	Brazil	61	2.75	Kenya	76	2.52
Argentina	45	2.98	Philippines	65	2.69	Gambia, The	77	2.52
Estonia	47	2.95	El Salvador	66	2.66	Cambodia	81	2.50

Morocco and Tunisia. Close to the EU market, both Morocco and Tunisia have developed manufacturing activities as part of production chains with European multinational corporations, in areas such as garments, auto parts, and electronics (figure 1.2). Policymakers in both countries have been very sensitive to logistics reform and investments in ports, customs, and foreign participation in logistics services.

So, why does Morocco (94) score lower on the LPI than Tunisia (60) and other competitors, such as Romania (51) and Bulgaria (55)?

While implementing exemplary customs and port reforms, Morocco has not yet reaped the benefits of recent measures to develop the domestic logistics industry, notably trucking and warehousing (Arvis, Bellier, and Raballand 2006). At the same time, Tunisia not only implemented some of the core reforms earlier than Morocco but also developed an electronic data interchange system that dramatically simplified the customs clearance process by integrating several procedures. And their Eastern European competitors have directly benefited from the EU accession process.

Figure 1.2 Performance of selected middle income countries



Nigeria, Senegal, and Ghana. Among the low income countries (figure 1.3), Senegal (105) and Ghana (129) rank significantly lower than Nigeria (97). Senegal and Ghana have both implemented rather successful customs reform, with the African showcase of IT systems for revenue agencies (Gainde in Senegal and CGnet in Ghana) to improve customs clearing (De Wulf and Sokol 2004). By contrast, Nigeria initiated its customs reforms only recently. Forwarders praise the clearance system in Senegal (76 on border processing), but are overwhelmingly negative for Nigeria (96 on border processing). However, they have the opposite opinion for the quality of support services (such as ports and trucking), where Nigeria has benefited from efficient port operations, thanks to privatization of the main container terminals.

Significant differences can be observed even among countries facing the most severe logistical challenges—landlocked countries in Africa and Central Asia. In East Africa, Uganda, Malawi, and Zambia are landlocked, yet they rank among the top 15 performers of the 39 Sub-Saharan African countries. Each is served by a fairly efficient logistics industry operating in a reasonably competitive environment. Malawi and Zambia also benefit

from being connected to the South African gateway. By contrast, landlocked countries in West and Central Africa ranked lower in the index are poorly served by a fragmented and largely overregulated services industry (characterized by practices such as the *tour de role*).⁷

Uganda, Malawi, and Zambia are landlocked, yet they rank among the top 15 performers of the 39 Sub-Saharan African countries

The LPI gap, trade, and FDI: Good logistics performers benefit more from globalization

The LPI gap (the difference between a country’s actual LPI ranking and its expected ranking based on its level of income) also highlights the association between logistics performance and trade and foreign direct investment (FDI) outcomes. Good logistics performers benefit more from globalization. Logistically friendly countries are more likely to have better global value chain integration and attract export-oriented FDI. Since trade and FDI are the key channels for the international diffusion of knowledge, poor logistics may impede access to new technology and know-how and slow the rate of productivity growth. Conversely, increased trade creates demand for good logistics, putting pressure on facilitating reforms and sustaining a market for modern services.

This is demonstrated by cross-country analyses of the relationship between growth, export

Figure 1.3 Performance of selected low income countries

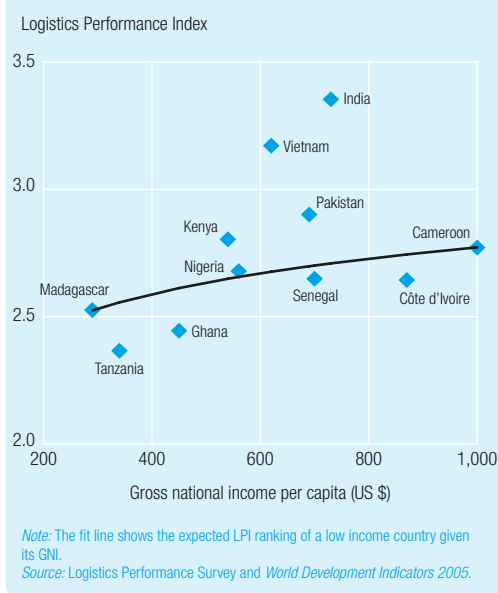


Figure 1.4 Logistics performance is associated with the diversification of exports, 2005



Figure 1.5 Trade expansion of non-oil-exporting developing countries and logistics performance, 1992–2005



diversification, or trade expansion, and the LPI. Countries ranked highly on the LPI also tended to have more diversified exports. For non-oil-exporting developing countries the standard

deviation of this gap is 0.3, while overachievers have a LPI gap of at least 0.5 (figure 1.4).

Likewise, countries undergoing trade expansion (increasing trade—imports and exports—to GDP) tended to also be those outperforming on the LPI relative to their level of income (those with a positive LPI gap). A logistics overachiever with an LPI gap of 0.5 experiences 2 percent more trade expansion, 1 percent more annual growth, or export 40 percent more variety of products (figure 1.5 and technical note 2) than other countries at the same income level.

These significant correlations should be interpreted in terms of their association rather than causality. Improvements in the supply chain contribute significantly to competitiveness by reducing transaction costs. At the same time, a growing, diversifying economy is likely to have the will and the means to improve its logistics performance.

Countries seeking to benefit more from globalization need to identify the key aspects of logistics performance, in particular in terms of their impact on competitiveness. This is the subject of the next section.

Reliability is the biggest concern of logistics professionals

To provide a more complete picture of the key factors determining logistics performance, the Logistics Performance Survey asked logistics professionals about the institutions and processes supporting logistics operations in the countries they are based in (table 2.1). It asked them to assess critical attributes of the supply chain including: timeliness of deliveries, quality of transport and IT infrastructure, efficiency of border clearance processes, competence of the local logistics industry, and domestic costs of services (see appendix table A2) as well as provide time and cost data (appendix table A3).

The questions delved into the quality of infrastructure, the competence of private and public logistics service providers, the roles of customs and other border agencies, such governance issues as corruption and transparency, and the reliability of the trading system and supply chains.⁸ Reliability (measured by the predictability of the clearance process and the timely delivery of shipments) emerged as a key concern,

with the difference in satisfaction between the high and low performing countries much larger than for any other question in the survey. Some of the reasons for this are discussed at the end of this section.

Factors determining logistics performance

Quality of infrastructure. Telecommunications and IT infrastructure are an essential component of modern trade processes. The physical movement of goods now entails the efficient and timely exchange of information. In countries in the LPI's top two quintiles, logistics operators rarely have any issues with the quality of the telecommunications and IT infrastructure, but close to half of them express concerns in countries ranging from average to lowest performers. In Sub-Saharan Africa 43 percent of respondents see this as an issue (appendix table A2).

Table 2.1 How logistics professionals assess institutions and processes

Percent of respondents

	Top quintile Highest performance	Second quintile High performance	Third quintile Average performance	Fourth quintile Low performance	Bottom quintile Lowest performance
Concerned about the quality of telecommunications and IT infrastructure	6	7	41	27	46
Concerned about the quality of the physical transport infrastructure (ports, roads, warehouses)	17	28	59	46	57
Satisfied with customs	55	32	19	18	11
Satisfied with other border government agencies	38	13	10	9	18
Satisfied with private logistics services ^a	59	34	18	16	11
Satisfied with professional organizations	46	28	6	21	17
Concerned with frequent solicitation of informal payments	6	23	34	49	56
Satisfied with transparency of border processes ^b	72	44	38	33	26
Imports cleared and delivered as scheduled	87	69	32	39	13

a. Aggregation of customs brokers, distributors, and road operators.

b. Aggregation of the results on the predictability of changes in regulations and transparency of customs clearance process.

Source: Logistics Performance Survey, appendix table A2, appendix table A3.

The way the local market for logistics services is regulated directly affects a country's ability to use the physical internet to connect to global markets

The quality of transport infrastructure remains a concern in close to or more than half of the logistics operators in average, low, and lowest performers. That concerns also exist in even the highest and high performing countries reflects the challenge of maintaining physical infrastructure at a level able to satisfy rapidly growing demands.

Competence of private and public logistics service providers. The performance of the supply chain depends on the quality of services delivered by the private sector through customs brokers and road transport operators—and on the competence and diligence of public agencies in charge of border procedures. In these areas, the three bottom quintiles generally fare much worse than the top quintile, and the differences in quality are as significant as those for infrastructure (see table 2.1). For example, the satisfaction with customs brokers is fairly high for the upper middle income countries (around 50 percent), but it is only 8 percent for private providers in Sub-Saharan Africa (see appendix table A2). For the lower performers, the dissatisfaction with the quality of trade logistics services applies to both the private and public sector. In those countries where logistics performance is high, there is more satisfaction with private providers than with public providers. The negative view of private providers in the lower performers is an important insight. Too often in developing countries, and notably in Africa, inadequate regulations and the absence of competition lead to corruption or poor services—such as those provided by “suitcase businessmen” at border posts. Often the mere presence of these operators disturbs the clearance process and hinders the emergence of competent local logistics operators who can work with international operators.

Customs and other border agencies. Clearance at the border is not only a matter of customs diligence. Law enforcement agencies and ministries of agriculture and industry also intervene in the process. Customs performance tends to be better than that of other border agencies; on average, customs clearance accounts for a third

of import time (box 2.1). This underscores the importance of addressing the coordination of border agencies, especially in countries that already have attained good customs clearance.

Corruption and transparency. Logistics performance also depends on broader policy dimensions, including the overall business environment, the quality of regulation for logistics services, and most important, on overall governance. The way the local market for logistics services is regulated directly affects a country's ability to use the physical internet to connect to global markets. The transparency of government procurement, the security of property from theft and looting, the macroeconomic conditions, and the underlying strength of institutions are critical factors in determining logistics performance. Unsurprisingly, ratings of the domestic environment in such areas as corruption and the transparency of processes and regulation reflect these findings. The rating for transparency of border processes consistently declines along with LPI scores for these groups of countries: poor performers in the LPI were also poor performers on transparency of border processes (see table 2.1). Solicitation of informal payments is rare among the top 30 countries but common among lower performers (close to or more than 50 percent of responses).

Reliability of the trading system and supply chains. For traders at the origin or the destination of the supply chain, what matters most is the quality and reliability of logistics services, measured by the predictability of the clearance process and timely delivery of shipments to destination. The difference in satisfaction between the high and low performing countries on this question is much larger than for any other question in the survey. Performance data derived from the survey on the time (days) for delivery of goods confirms the same phenomenon (box 2.2).

Taken together, all these factors—quality of infrastructure, the competence of private and public logistics service providers, the roles of customs and other border agencies, governance issues such as corruption and transparency, and

Clearance processes by customs and other agencies are among the most important links in the global supply chain. Key facilitation principles have been addressed by several international agreements (Kyoto convention, GATT, and the current negotiations on trade facilitation at the WTO). In the Logistics Performance Survey, logistics professionals provide in-depth evaluations in this critical area, across countries (appendix table A2 and appendix table A3).

The Logistics Performance Survey results show a high degree of IT use in Africa, 55 percent, a credit to UNCTAD's Asycuda program and some homegrown projects. Preshipment inspection is a major source of delays in Africa (56 percent) and Latin America (43 percent). Physical inspections and the time needed for clearance are also strongly associated with overall logistics performance. But only one-third of the time to import is explained by the customs process, the rest by transportation, handling, or delays caused by private operators.

Customs and border processing performance, by region

Percent

	OECD high income	Non-OECD high income	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
Estimated percentage of physical inspections	3	22	22	14	25	45	36	48
Respondents agreeing that traders demonstrating high levels of compliance receive expedited customs clearance	54	25	41	51	42	42	57	17
Respondents able to use IT to submit customs declaration	70	42	28	46	58	53	50	55
Time (days) and cost (US\$)								
Time between accepted customs declaration and customs clearance	1.0	1.7	2.1	1.7	2.7	1.9	2.4	4.2
Average time to export	2.4	2.9	3.9	2.8	3.9	3.7	3.6	8.1
Average time to import	3.2	3.6	4.4	3.5	4.8	6.0	6.5	12.3
Cost to import a 40-foot container or a semi-trailer (US\$)	663	572	819	936	1,000	609	880	2,124

Source: Logistics Performance Survey, appendix table A2, and appendix table A3.

The Logistics Performance Survey captures the time to import and export and, more important, the dispersion in time as a measure of predictability. Delays tend to increase with lower overall performance, but also with unpredictability. The effect is much

stronger in some countries in the bottom quintile—not only in poor landlocked countries, such as Chad, but also in coastal Tanzania and Benin, which have import times of more than a week.

Customs and border processing performance, by quintile

	Top quintile Highest performance	Second quintile High performance	Third quintile Average performance	Fourth quintile Low performance	Bottom quintile Lowest performance
Best time to import (best decile of shipments)	1.9 days	2.1 days	3.7 days	4.6 days	6.1 days
Median time to import	3.2 days	3.9 days	5.4 days	7.1 days	13.6 days

Source: Logistics Performance Survey and appendix table A3.

Suppliers to the same automobile manufacturer will carry 7 days of inventory in Italy but 35 days in Morocco. Some retailers in African countries maintain three months of inventories or more

the reliability of the trading system and supply chains—confirm once again that logistics performance is about predictability (see table 2.1). Predictability is central to the overall costs that companies incur in logistics and thus to their competitiveness in global supply chains.

Logistics and competitiveness: Why predictability and reliability matter more than costs

Just as strong logistics performance is associated with increased trade in developing countries (section 1), firm-level competitiveness is extremely sensitive to the quality of the logistics environment in which it operates. A firm’s competitiveness is influenced by cost and performance of its supply chain and thus depends on the overall logistics environment—but the main impact is less through cost than through the predictability of the deliveries.

Firms have to bear the direct costs associated with moving goods, such as freight costs, port and handling charges, procedural fees (such as bonds), agent fees, and side payments. But they also have to absorb the induced costs associated with hedging for the lack of predictability and reliability of the supply chain (Arvis and others 2007) (figure 2.1). They may need to carry higher inventories of supplies or finished products, or switch to more expensive modes of transportation to be sure to meet delivery schedules (Guasch 2003).

Induced costs are inversely related to predictability and also tend to rise steeply with declining logistics performance. For example, suppliers to the same automobile manufacturer will carry 7 days of inventory in Italy but 35 days in Morocco. Some retailers in African countries maintain three months of inventories or more. Bangladesh has to ship, on average, 10 percent

of its garment production by air to be certain to meet the schedules of European buyers.

The high induced costs of unpredictability in the international supply chain are a major constraint for companies and countries trying to diversify into higher value production. In global production chains countries face a double challenge of maintaining an efficient chain not just for exports but also for imported inputs and components. This can be a particular burden for least developed countries, where inputs often cannot be sourced regionally.

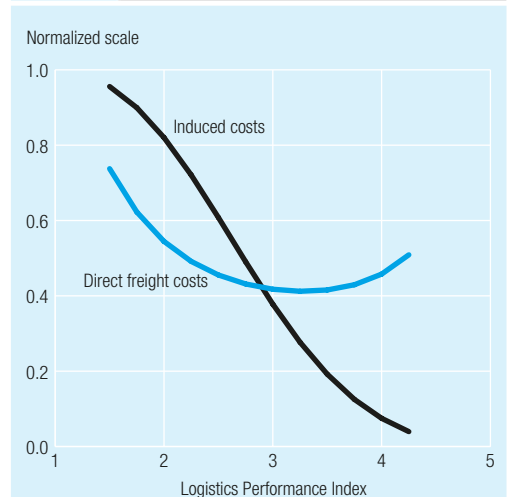
Improvements in the quality of the supply chain can thus open new opportunities to entrepreneurs, even in otherwise constrained countries. Southern Mali and Burkina Faso can consider diversifying into exports of fresh mangoes (three-week shelf life) as well as cotton exports (typically stored at ports for months), thanks to greater cooperation between local operators and international logistics providers and better performance of the railroad from Abidjan, following a well executed privatization program.

Induced costs in countries with good logistics performance are much lower than those for countries with low logistics performance (figure 2.2), differences that can determine a

Figure 2.1 Structure of logistics costs supported by traders



Figure 2.2 Direct freight costs versus induced costs assessed by respondent



Note: The normalized scale is a nonmonetary measure of the relative level of costs across countries, as assessed by respondents in the survey. The curves are fitted to a logistics model, with a utility quadratic in the LPI. Induced costs = percent of respondents saying that import shipments are not cleared and delivered on time. Direct costs = percent of respondents saying that overall direct logistics costs are high by international standards.

product's competitiveness in international markets. By contrast, direct logistics costs tend to be much more similar across countries and across different logistics performance levels. They are less of a differentiating factor in a country's ability to compete. Domestic freight services are tradable, at least regionally. The costs of capital and some direct inputs, such as fuel, are also fairly comparable, even in countries at very different levels of development. For developing countries the lower cost of labor may be offset by lower productivity, hence the U curve for direct costs.

Excluding landlocked countries, the average inland costs (port and hauling) of importing a 40-foot container or semi-trailer, for all countries in the survey, is about \$700: typically 1.5 percent of the value of goods or the equivalent of two weeks of inventories, much less than the actual costs in many developing countries once large induced costs are factored in.⁹ This average masks wide differences. Large coastal countries, such as Russia and the United States, have higher costs due to long domestic distances. Other countries are primarily trading overland, as in Eastern Europe, increasing the costs.

Higher overall import costs are observed in low logistics performers. In Africa, even in the larger coastal economies of Nigeria and Kenya, the cost of importing or exporting a 40-foot container is in excess of \$2,000. Costs are also

increased by the low economies of scale for multimodal infrastructure or structural imbalances of volumes of trade along corridors. In some regions, especially in Africa and Central Asia, the freight costs are augmented by a proliferation of official and unofficial payments. In western Africa facilitating payments and mandatory procedural fees double the direct cost of transportation (Arvis and others 2007).

The competitive position of countries at an intermediate development level tends to be eroded if they have low logistics performance and thus much higher induced costs. Firms in lowest performing countries are even worse off, since they have to support both high freight costs and very high induced costs (see figure 2.2).

The above trends show that the higher logistics costs borne by traders in poor environments are only partially associated with freight transport. And because of their endogenous nature, they can thus be lowered by better domestic systems and policies. The large differences observed between countries can be explained by the fact that the overall performance of a country is largely influenced by the weakest link in its supply chain. Poor performance, even in only one or two areas, can have very strong implications for overall country performance. This insight is also important for the design of effective reforms, the subject of the next section.

The large differences observed between countries can be explained by the fact that the overall performance of a country is largely influenced by the weakest link in its supply chain

SECTION **3**

Lessons for reform

Traditional measures of performance such as direct freight costs and average delays, while important, may not capture the overall logistics performance and thus the ability of countries to use trade for growth

By providing a comprehensive assessment of the gaps and constraints in logistics performance, the LPI and other information derived from the Logistics Performance Survey can help policymakers, private stakeholders, and international organizations quantify the constraints countries face in connecting globally.

The LPI and its indicators also suggest that policymakers may have to expand the traditional “facilitation agenda,” focused on trade-related infrastructure and customs information technology, and pursue improvements in the markets for logistics services. Reforms to improve logistics should follow an integrated approach, focusing on the interaction between infrastructure and public and private services, addressing coordination failures and identifying constituencies for reform. To be effective, reforms should improve the predictability and reliability of shipments and not just focus on reducing average costs and delays.

For instance, traditional measures of performance such as direct freight costs and average delays, while important, may not capture the overall logistics performance and thus the ability of countries to use trade for growth. The predictability and reliability of shipments, while more difficult to measure, are more important for firms and may have a much greater impact on their ability to compete.

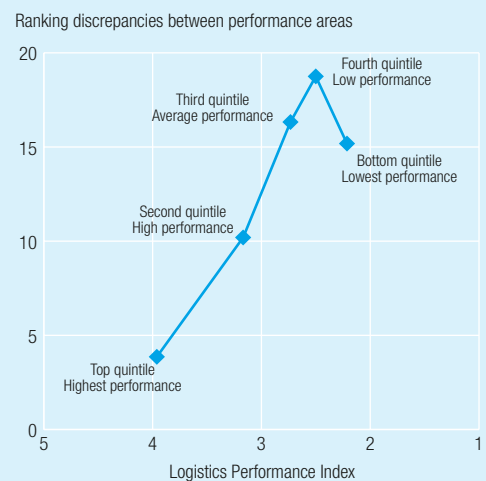
Reforms must be comprehensive

A gradual approach targeting a single factor of supply chain performance (trade infrastructure or a customs procedure) can bring some initial results, but ultimately may prove limited or unsustainable. For example, poor integration among the agencies involved in

border processes may neutralize the benefit of a customs modernization program (DeWulf and Sokol 2005). Facilitation initiatives for trade corridors may not produce visible effects without modernization of the private services and supporting the market (Arvis and others 2007).

The synergies between the various areas of reform—such as customs, border management, infrastructure, and transport regulation—are supported by further analysis of the Logistics Performance Survey dataset. For instance, the consistency between the different dimensions in logistics performance is lower for lower performing countries: high performers are consistently high performers across all indicators, while low performers are inconsistent (figure 3.1).

Figure 3.1 High performers are consistent performers: Discrepancies across factors of performance



Note: The indicator used to illustrate the consistency in performance is the standard deviation of country ranking along the seven component indicators of the LPI. While there is less correlation among the various factors of performance, the effect in this chart is amplified by the fact that the LPI values for countries in the bottom quintile have more “noise” due to a smaller number of assessments.

Table 3.1 Percent of respondents acknowledging positive trends in developments for the following areas, during the last three years

	High income OECD & non-OECD	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
Overall business environment	57	44	66	61	68	64	38
Availability of private sector services	58	54	82	70	81	78	51
Quality of telecommunications infrastructure	85	47	89	65	98	71	62
Quality of transport infrastructure	56	41	57	38	67	40	33
Other border crossing-related government agencies clearance procedures	43	26	62	28	38	30	42
Customs clearance procedures	65	38	69	58	70	60	48

Source: Logistics Performance Survey and appendix table A2.

Some areas of reform are tackled more than others

Most governments are carrying out policy reforms and furthering public investments in critical areas of the supply chain (table 3.1). But facilitation efforts appear to have had significantly higher impact in customs than in the other border agencies. As seen from the Logistics Performance Survey results, for most countries surveyed, improvements in IT are more widespread than in the other areas, followed by the increased availability of private services.

Performance is improving in the majority of areas surveyed in Europe and Central Asia, in the Middle East and North Africa, and in South Asia (table 3.1). But the perception of trends in Sub-Saharan Africa and East Asia is not as strong. Logistics operators in Africa may still be looking for basic improvements, while those in East Asia look for continuing improvements to keep up with fast-growing demand.

Implementing reform is not easy

Creating an effective logistics environment requires consistent improvements and the continuing participation of all stakeholders, who can demand concrete and practical improvements in performance. Although the problems to be addressed are rather specific, the ability to tackle them depends largely on a country's overall governance and institutional context.

Poor logistics environments are often characterized by rent-seeking, which creates powerful vested interests working to maintain the

status quo. Countries become trapped in a vicious circle where rent-seeking leads to poor logistics services, often leading to fraud and giving rise to over regulation and unfriendly procedures. This in turn discourages investment and the entry of more efficient service providers, completing a vicious circle of rent-seeking and poor performance (figure 3.2).

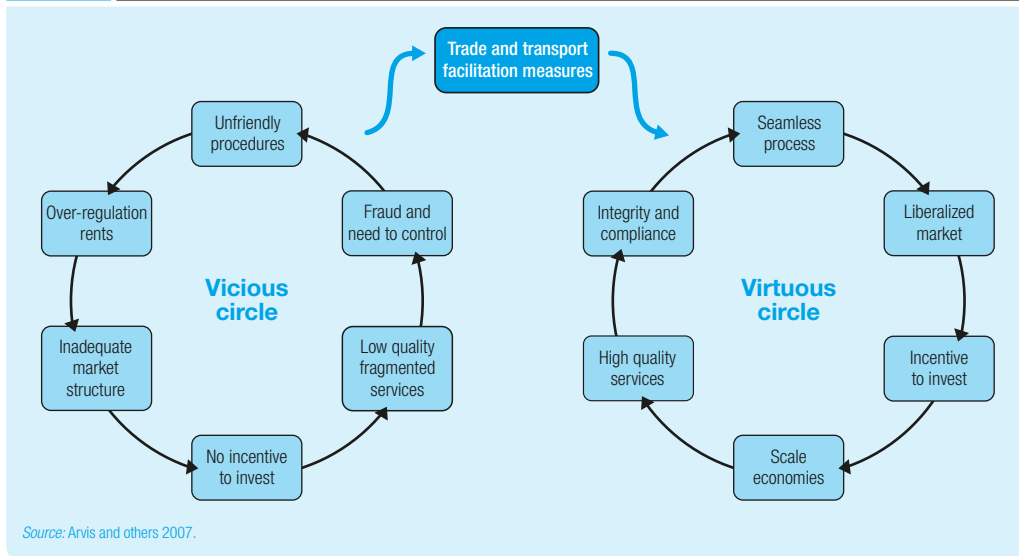
Improving logistics requires the capacity to move toward the virtuous circle—connecting services, infrastructure investments, and streamlined administrative processes. This encompasses the technical capacity to undertake reforms in each sub-area and the ability to overcome the political constraints to effective and comprehensive reforms. Change needs to be supported by a wide constituency, so countries with a large and diverse export community have a tremendous advantage over others, such as oil exporters. Unsurprisingly, logistics operators in India and Vietnam are twice as positive as those in other low income countries about the role of business groups in trade facilitation (appendix table A2).

While integrated reforms are essential, priorities and strategies may differ

A comprehensive reform of logistics and trade facilitation is essential. To close the logistics gap, policymakers should pursue improvements in the markets for logistics services, reduce coordination failures (especially those of public agencies active in border control), and build strong constituencies to support reform.

International companies can bring global knowledge and pressure for change. But the support of local constituencies of exporters, operators, and public agencies is crucial

Figure 3.2 Vicious and virtuous logistics



This effort will demand more integrated supply chain-related reforms, according to the performance of countries, with implications for policymakers and development agencies. For the most severely constrained countries—typically landlocked countries in Africa and Central Asia—innovative solutions may need to be found, and international donors will have an important role.

The Logistics Performance Survey indicates that the differences in the logistics performance between the third and fourth quintiles are often very small and also much smaller than with the others. As a result these two quintiles have been grouped together. Much bigger differences in values are seen for the top two quintiles and the bottom quintile.

The following four groups of countries can be identified in terms of the transition from the vicious circle to the virtuous circle:

- Logistics friendly (corresponding to the top quintile).
- Comprehensive reformers—emerging economies in East Asia and Latin America, new EU member states, South Africa, India (corresponding to the second quintile).
- Partial reformers—oil producers, most countries in Africa, South Asia, and the Middle East (corresponding to the third and fourth quintile).

- Logistics unfriendly—countries with difficult geography (landlocked), least developed countries, or both (corresponding to the fifth quintile).

This classification of countries is a broad typology. Given the confidence intervals and the methodology employed, it is indicative of a country’s logistics performance, but should not be inferred directly from the LPI ranking for any specific country. The association with the quintiles should instead be considered a useful guide for setting reform priorities (figure 3.3).

This typology of countries implies that the agenda for reforms, the priorities, and implementation strategies may vary dramatically according to the broader logistics environment, even though the basic ingredients of successful component reforms, such as for customs or ports, may be the same (see table 3.3).

Cross-cutting reforms need to be supported by broad constituencies. International companies can bring global knowledge and pressure for change. But the support of local constituencies of exporters, operators, and public agencies is crucial. However, these constituencies tend to be weak in partial reformers and nonexistent in the logistics unfriendly countries.

The LPI rankings and indicators provide robust benchmarks that may help policymakers—and particularly the private

Figure 3.3 Logistics typology

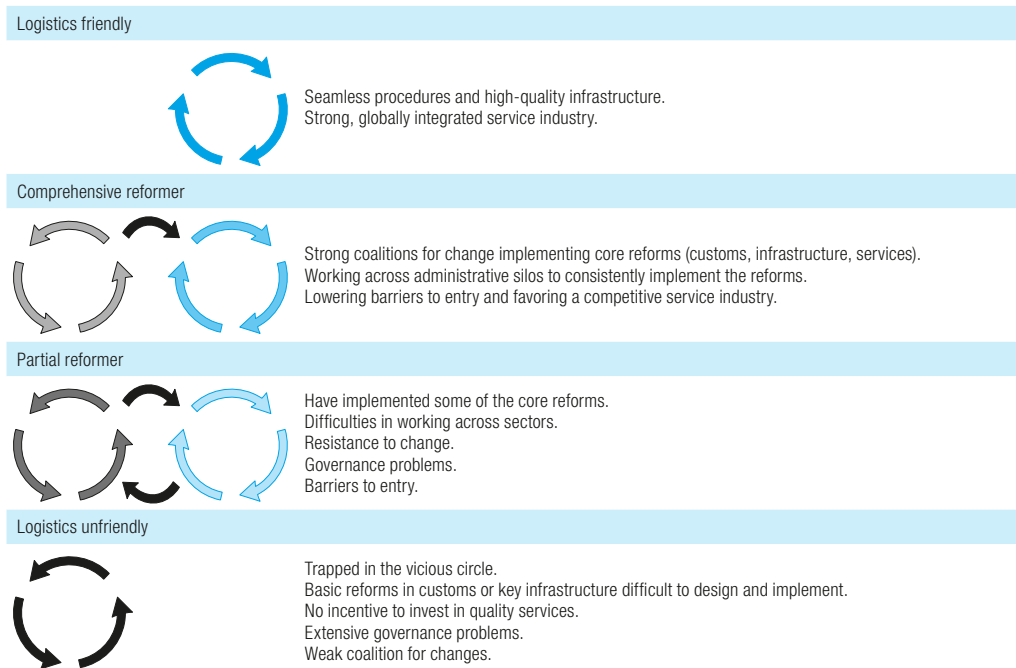


Table 3.2 Identify the severity of constraints to overall performance

Areas for reform	Logistics friendly	Comprehensive reformers	Partial reformers	Logistics unfriendly
Trade-related physical infrastructure	x	xx	xx	xxx
IT trade-related infrastructure		x	x	xx
Customs		x	xx	xxx
Other border processes	xx	xxx	xxx	xxx
Reliability of support services		x	xx	xxx
Other governance-related constraints	x	xx	xxx	xxx
Constituency for reform	x	x	xx	xxx

x = mild constraint xx = medium constraint xxx = severe constraint

sector—to build the case for reform. By showing countries how they compare with their competitors and shining a light on the costs of poor logistics performance, it is hoped that the LPI and its indicators may help countries break out of the vicious circle of logistics unfriendliness.

In identifying the key problem areas and constraints, the LPI and its indicators also aim to help guide the preparation of more in-depth, country-specific assessments and strategies, such as trade and transport facilitation audits (Raven 2001), that are needed to generate concrete improvements in logistics performance.

Technical note 1

Selection of countries

Technical note table 1.1 presents the matrix of how the eight countries are selected based on the respondent's country of work.

The LPI methodology uses the World Bank Classification of Countries.¹⁰ Technical note table 1.2 classifies all World Bank member countries (184) and all other economies with populations of more than 30,000 (208). The country coverage by the logistics performance index (150 total) is also shown.

For operational and analytical purposes, economies are divided among income groups according to 2005 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low income, \$875 or less; lower middle income, \$876–3,465; upper middle income, \$3,466–10,725; and high income, \$10,726 or more. Other analytical groups based on geographic regions are also used.

Technical note table 1.1 Six country selection rules

	Respondents from low income countries	Respondents from middle income countries	Respondents from high income countries
Respondents from coastal countries	Five most important export partner countries + Three most important import partner countries	Three most important export partner countries + The most important import partner country + Four countries randomly, one from each country group: a) Africa b) East Asia + Central Asia c) Latin America d) Europe less Central Asia + OECD	Four countries randomly out of one list of five most important export partner countries and five most important import partner countries + Four countries randomly, one from each country group: a) Africa b) East Asia + Central Asia c) Latin America d) Europe less Central Asia + OECD
Respondents from landlocked countries	Four most important export partner countries + Two most important import partner countries + Two landlocked countries	Three most important export partner countries + One most important import partner country + Two landlocked countries + Two countries randomly, one from each country group: a) Africa + East Asia + Central Asia + Latin America and b) Europe less Central Asia + OECD	

Technical note table 1.2 Regional coverage of the Logistics Performance Index

Income groups/world regions	Total countries in group/region	Number of countries ranked in LPI	LPI's coverage of group/ region (%)
Low income	54	51	94
Middle income	98	65	66
Lower middle income	58	41	71
Upper middle income	40	24	60
Low & middle income	152	116	76
East Asia & Pacific	24	13	54
Europe & Central Asia	27	25	93
Latin America & Caribbean	31	21	68
Middle East & North Africa	14	11	79
South Asia	8	7	88
Sub-Saharan Africa	48	39	81
High income	56	34	61
European Monetary Union	12	12	100
High income (OECD)	24	23	96
High income (non-OECD)	32	10	31
Heavily indebted poor countries (HIPC)	40	37	93
Least developed countries (UN classification)	49	41	84
Landlocked developing countries (UN classification)	31	26	84
Commonwealth of Independent States	12	10	83
Transitional	24	22	92
Organization of Petroleum Exporting Countries	12	10	83
Total countries	208	150	72

Technical note 2

The Logistics Performance Index and multivariate regressions

Straightforward econometric analyses point to significant association between the LPI and outcomes such as:

- Medium term growth over 1992–2005.
- Trade expansion, defined as the overall annual change in trade openness over the same period. It is excess of trade growth over GDP growth.
- The index of trade diversification—the Theil index, which can be interpreted

as the natural logarithm of the number of exported varieties.

The sample of countries excludes high income countries and oil exporters. The results are robust to other choices of period (technical note table 2.1). Regression 1 measures the LPI against the level of development (Log [GNI/cap] 2005). The residual measures how much the countries are performing logistically against their potential (the standard deviation in LPI gap is 0.3). Regressions 2 to 6 measure one of the growth, trade expansion, or diversification variables against the LPI index and Log (GNI/cap), or against the sole LPI gap.

Technical note table 2.1

Independent variable	Dependent variable					
	Regression 1 LPI	Regression 2 Growth	Regression 3 Growth	Regression 4 Trade expansion	Regression 5 Trade expansion	Regression 6 Theil index
LPI		2.0%		3.7%		1.05
		(2.8)**		(3.5)**		(3.5)**
Log(GNI/cap)	0.422	-0.8%		-2.1%		0.95
	(7.1)**	(-1.5)		(-2.7)**		(4.4)**
LPI gap			2.0%		3.7%	
			(2.8)**		(3.5)**	
R ²	0.35	0.08	0.08	0.12	0.11	0.44
F	50.9	3.9	7.8	6.4	12.1	38.5
Number of countries	97	97	97	97	97	97

*Significant at the 5 percent level.
**Significant at the 1 percent level.

Notes

1. Makillie (2006).
2. The methodology developed by Daley and Murphy in 1993—using a survey format, a 4-point scale, and open-ended questions—set out to measure the perceived importance and influence of different component attributes that affect the logistical friendliness of countries. In a follow up study by Ojala and Qeiroz (2004) only those characteristics identified as best encapsulating logistics performance were included for evaluation.
3. These interviews were conducted in the context of the Trade and Transport Facilitation Audits (TTFA) performed by the World Bank and others (Raven 2001) and contributed substantially to refining the methodology.
4. While respondents know best the countries with which they trade most, relying on trade statistics alone would leave small and low income economies uncovered.
5. In appendix table A1, the short names for these seven areas of performance are: customs, infrastructure, international shipments, logistics competence, tracking and tracing, domestic logistics costs, and timeliness.
6. Domestic costs were found to be uncorrelated to the other areas in the LPI. Therefore, being less significant, this component was dropped from the composition of the index.
7. *Tour de role* refers to a heavily regulated freight allocation system where truckers are queuing to get loads in turns. Price is typically set by collusion between transport unions and the government.
8. In appendix table A2, performance is evaluated in 30 subareas for which LPI quintiles, regional, or income group averages allow for meaningful comparisons. For most countries the number of respondents in this section of the survey is too small to warrant a country statistic.
9. The typical value of a container of consumer goods is \$50,000, while the inventory value is about 0.1 percent per day (Arvis and others 2007).
10. For detailed information on the World Bank Classification of Countries, visit www.worldbank.org/data/.

References

- Arvis, Jean-François, Michel Bellier, and Gaël Raballand. 2006. "Success factors for improving logistics in a middle-income country." Transport Notes Series 35. World Bank, Washington, D.C.
- Arvis, Jean-François, Gaël Raballand, and Jean-François Marteau. 2007. "The cost of being landlocked: logistics costs and supply chain reliability." Policy Research Working Paper 4258. World Bank, Washington, D.C.
- Daley, James M., Douglas R. Dalenberg, and Paul R. Murphy. 1993. "Doing business in global markets: Perspectives of international freight forwarders." *Journal of Global Marketing* 6 (4): 53–68.
- Daley, James M., and Paul R. Murphy. Spring 1999. "Revisiting logistical friendliness: perspectives of international freight forwarders." *Journal of Transportation Management* 65–71.
- De Wulf, Luc and José Sokol, eds. 2004. *Customs modernization initiatives: case studies*. Washington, D.C.: The World Bank.
- . 2005. *Customs modernization handbook*. Washington, D.C.: The World Bank.
- Guasch, J., and Joseph Luis Kogan. 2003. "Just in case inventories: a cross country analysis." Policy Research Working Paper 3012. World Bank, Washington, D.C.
- Labaste, Patrick. 2003. "Linking farmers to market, exporting Malian Mangoes to Europe." Working Paper 60. World Bank, Africa Region, Washington, D.C.
- Makillie, Paul. 2006. "The physical internet." *The Economist*. June 15.
- Ojala L., and C. Qeiroz, eds. 2004, March. "Transport Sector Restructuring in the Baltic States towards EU accession." Working Paper 31123. World Bank, Washington, D.C.
- Ojala, Lauri, Tapio Naula, and Torsten Hoffmann. 2005. "Trade and transport facilitation: audit of the Baltic States (TTFBS)." Working Paper 31121. World Bank, Europe and Central Asia Region, Washington, D.C.
- Raven, John. 2001. *Trade and transport facilitation: a toolkit for audit, analysis, and remedial action*. Washington, D.C.: The World Bank.
- Rodrigues, Bowersox, and Calantone. 2005. "Estimation of global and national logistics expenditures: 2002 Data Update." *Journal of business logistics* 26 (2):1–16.
- Wilson, John, Tsunehiro Otsuki, and Catherine Mann. 2004. "Assessing the potential benefit of trade facilitation: a Global perspective." Policy Research Working Paper 3224. World Bank, Washington, D.C.
- World Bank. 2005. *World Development Indicators 2005*. Washington D.C.: World Bank.

Appendix



Table A1	Country rankings on the Logistics Performance Index and indicators	26
Table A2	Country-specific environment and institutions data averages, by income group and region	34
Table A3	Country-specific performance data, by country	36

Table A1 Country rankings on the Logistics Performance Index and indicators

Country	Logistics Performance Index			Customs		Infrastructure		International shipments	
	LPI rank	Score	Confidence interval	Rank	Score	Rank	Score	Rank	Score
Singapore	1	4.19	0.05	3	3.90	2	4.27	2	4.04
Netherlands	2	4.18	0.04	1	3.99	1	4.29	1	4.05
Germany	3	4.10	0.03	4	3.88	3	4.19	4	3.91
Sweden	4	4.08	0.08	5	3.85	5	4.11	5	3.90
Austria	5	4.06	0.11	8	3.83	9	4.06	3	3.97
Japan	6	4.02	0.03	11	3.79	6	4.11	9	3.77
Switzerland	7	4.02	0.08	6	3.85	4	4.13	14	3.67
Hong Kong, China	8	4.00	0.04	7	3.84	8	4.06	7	3.78
United Kingdom	9	3.99	0.03	13	3.74	10	4.05	6	3.85
Canada	10	3.92	0.05	9	3.82	12	3.95	8	3.78
Ireland	11	3.91	0.11	10	3.82	19	3.72	11	3.76
Belgium	12	3.89	0.05	16	3.61	11	4.00	16	3.65
Denmark	13	3.86	0.10	2	3.97	14	3.82	15	3.67
United States	14	3.84	0.03	19	3.52	7	4.07	20	3.58
Finland	15	3.82	0.13	14	3.68	17	3.81	30	3.30
Norway	16	3.81	0.09	12	3.76	15	3.82	19	3.62
Australia	17	3.79	0.09	17	3.58	20	3.65	12	3.72
France	18	3.76	0.05	21	3.51	16	3.82	18	3.63
New Zealand	19	3.75	0.12	18	3.57	22	3.61	10	3.77
United Arab Emirates	20	3.73	0.08	20	3.52	18	3.80	13	3.68
Taiwan, China	21	3.64	0.09	25	3.25	21	3.62	17	3.65
Italy	22	3.58	0.05	29	3.19	23	3.52	21	3.57
Luxembourg	23	3.54	0.30	15	3.67	13	3.86	45	3.00
South Africa	24	3.53	0.10	27	3.22	26	3.42	22	3.56
Korea, Rep.	25	3.52	0.07	28	3.22	25	3.44	24	3.44
Spain	26	3.52	0.08	30	3.17	24	3.51	23	3.45
Malaysia	27	3.48	0.07	23	3.36	28	3.33	26	3.36
Portugal	28	3.38	0.11	26	3.24	31	3.16	33	3.23
Greece	29	3.36	0.15	31	3.06	35	3.05	37	3.11
China	30	3.32	0.04	35	2.99	30	3.20	28	3.31
Thailand	31	3.31	0.10	32	3.03	32	3.16	32	3.24
Chile	32	3.25	0.08	24	3.32	34	3.06	34	3.21
Israel	33	3.21	0.17	43	2.73	37	3.00	31	3.27
Turkey	34	3.15	0.13	33	3.00	39	2.94	42	3.07
Hungary	35	3.15	0.11	34	3.00	33	3.12	41	3.07
Bahrain	36	3.15	0.18	22	3.40	27	3.40	27	3.33
Slovenia	37	3.14	0.18	40	2.79	29	3.22	36	3.14
Czech Republic	38	3.13	0.15	36	2.95	36	3.00	43	3.06
India	39	3.07	0.08	47	2.69	42	2.90	39	3.08
Poland	40	3.04	0.11	38	2.88	51	2.69	52	2.92
Saudi Arabia	41	3.02	0.06	45	2.72	38	2.95	50	2.93
Latvia	42	3.02	0.16	58	2.53	58	2.56	29	3.31
Indonesia	43	3.01	0.13	44	2.73	45	2.83	44	3.05
Kuwait	44	2.99	0.52	59	2.50	46	2.83	76	2.60
Argentina	45	2.98	0.09	51	2.65	47	2.81	49	2.97
Qatar	46	2.98	0.19	67	2.44	55	2.63	46	3.00

Logistics competence		Tracking & tracing		Domestic logistics costs		Timeliness	
Rank	Score	Rank	Score	Rank	Score	Rank	Score
2	4.21	1	4.25	113	2.70	1	4.53
1	4.25	4	4.14	120	2.65	5	4.38
3	4.21	5	4.12	135	2.34	8	4.33
6	4.06	3	4.15	129	2.44	4	4.43
4	4.13	12	3.97	141	2.24	3	4.44
5	4.12	7	4.08	148	2.02	6	4.34
8	4.00	9	4.04	139	2.26	2	4.48
9	3.99	8	4.06	119	2.66	7	4.33
7	4.02	6	4.10	143	2.21	11	4.25
12	3.85	11	3.98	91	2.84	13	4.19
11	3.93	15	3.96	121	2.65	9	4.32
10	3.95	14	3.96	122	2.62	10	4.25
15	3.83	17	3.76	128	2.52	18	4.11
13	3.85	10	4.01	144	2.20	19	4.11
14	3.85	2	4.17	142	2.22	15	4.18
17	3.78	20	3.67	147	2.08	12	4.24
18	3.76	13	3.97	97	2.80	20	4.10
19	3.76	16	3.87	136	2.34	23	4.02
16	3.82	19	3.68	89	2.86	22	4.05
20	3.67	23	3.61	98	2.80	17	4.12
23	3.58	24	3.60	42	3.10	14	4.18
21	3.63	21	3.66	132	2.39	27	3.93
33	3.22	26	3.56	85	2.88	25	4.00
25	3.54	18	3.71	124	2.61	31	3.78
22	3.63	25	3.56	110	2.73	30	3.86
24	3.55	22	3.63	107	2.75	29	3.86
26	3.40	28	3.51	36	3.13	26	3.95
34	3.19	30	3.44	102	2.78	21	4.06
28	3.33	27	3.53	88	2.87	16	4.13
27	3.40	31	3.37	72	2.97	36	3.68
29	3.31	36	3.25	25	3.21	28	3.91
35	3.19	37	3.17	114	2.68	44	3.55
32	3.23	29	3.46	145	2.17	41	3.58
30	3.29	34	3.27	112	2.71	52	3.38
37	3.07	44	3.00	57	3.00	34	3.69
59	2.75	47	3.00	140	2.25	84	3.00
36	3.09	52	2.91	32	3.18	33	3.73
42	3.00	35	3.27	10	3.40	42	3.56
31	3.27	42	3.03	46	3.08	47	3.47
38	3.04	40	3.12	23	3.23	40	3.59
51	2.88	43	3.02	106	2.76	39	3.65
48	2.94	41	3.06	73	2.94	35	3.69
50	2.90	33	3.30	92	2.84	58	3.28
47	3.00	32	3.33	130	2.40	32	3.75
44	3.00	46	3.00	93	2.84	46	3.50
43	3.00	38	3.17	56	3.00	38	3.67

Table A1 Country rankings on the Logistics Performance Index and indicators (continued)

Country	Logistics Performance Index			Customs		Infrastructure		International shipments	
	LPI rank	Score	Confidence interval	Rank	Score	Rank	Score	Rank	Score
Estonia	47	2.95	0.11	42	2.75	41	2.91	56	2.85
Oman	48	2.92	0.22	46	2.71	43	2.86	79	2.57
Cyprus	49	2.92	0.13	41	2.77	40	2.91	51	2.92
Slovak Republic	50	2.92	0.17	55	2.61	52	2.68	38	3.09
Romania	51	2.91	0.18	56	2.60	50	2.73	35	3.20
Jordan	52	2.89	0.13	54	2.62	56	2.62	40	3.08
Vietnam	53	2.89	0.18	37	2.89	60	2.50	47	3.00
Panama	54	2.89	0.15	48	2.68	48	2.79	58	2.80
Bulgaria	55	2.87	0.15	66	2.47	63	2.47	59	2.79
Mexico	56	2.87	0.05	60	2.50	53	2.68	53	2.91
São Tomé and Príncipe	57	2.86	0.49	61	2.50	95	2.20	25	3.40
Lithuania	58	2.78	0.21	52	2.64	80	2.30	48	3.00
Peru	59	2.77	0.15	49	2.68	57	2.57	54	2.91
Tunisia	60	2.76	0.15	39	2.83	44	2.83	55	2.86
Brazil	61	2.75	0.07	74	2.39	49	2.75	74	2.61
Guinea	62	2.71	0.24	62	2.50	75	2.33	85	2.50
Croatia	63	2.71	0.20	78	2.36	61	2.50	67	2.69
Sudan	64	2.71	0.19	79	2.36	72	2.36	68	2.67
Philippines	65	2.69	0.15	53	2.64	86	2.26	63	2.77
El Salvador	66	2.66	0.13	75	2.38	68	2.42	61	2.78
Mauritania	67	2.63	0.19	70	2.40	96	2.20	77	2.60
Pakistan	68	2.62	0.16	69	2.41	71	2.37	65	2.72
Venezuela, RB	69	2.62	0.08	77	2.37	59	2.51	66	2.69
Ecuador	70	2.60	0.26	88	2.25	73	2.36	72	2.64
Paraguay	71	2.57	0.15	100	2.20	64	2.47	113	2.29
Costa Rica	72	2.55	0.11	64	2.49	67	2.43	82	2.53
Ukraine	73	2.55	0.15	97	2.22	74	2.35	83	2.53
Belarus	74	2.53	0.25	50	2.67	54	2.63	126	2.13
Guatemala	75	2.53	0.18	87	2.27	104	2.13	73	2.62
Kenya	76	2.52	0.17	81	2.33	100	2.15	60	2.79
Gambia, The	77	2.52	0.32	89	2.25	76	2.33	69	2.67
Iran, Islamic Rep.	78	2.51	0.20	63	2.50	66	2.44	78	2.59
Uruguay	79	2.51	0.10	86	2.29	70	2.38	100	2.40
Honduras	80	2.50	0.11	65	2.48	79	2.32	93	2.48
Cambodia	81	2.50	0.12	104	2.19	81	2.30	95	2.47
Colombia	82	2.50	0.10	116	2.10	85	2.28	75	2.61
Uganda	83	2.49	0.16	99	2.21	99	2.17	98	2.42
Cameroon	84	2.49	0.25	57	2.57	114	2.00	110	2.33
Comoros	85	2.48	0.15	85	2.30	65	2.46	108	2.33
Angola	86	2.48	0.22	71	2.40	88	2.25	87	2.50
Bangladesh	87	2.47	0.18	125	2.00	82	2.29	96	2.46
Bosnia and Herzegovina	88	2.46	0.17	84	2.32	87	2.26	86	2.50
Benin	89	2.45	0.21	142	1.80	134	1.89	62	2.78
Macedonia, FYR	90	2.43	0.24	126	2.00	83	2.29	70	2.67
Malawi	91	2.42	0.26	90	2.25	105	2.13	81	2.56
Sri Lanka	92	2.40	0.14	91	2.25	106	2.13	112	2.31

Logistics competence		Tracking & tracing		Domestic logistics costs		Timeliness	
Rank	Score	Rank	Score	Rank	Score	Rank	Score
45	3.00	58	2.84	18	3.29	53	3.35
67	2.67	63	2.80	20	3.25	24	4.00
58	2.77	51	2.92	76	2.92	62	3.25
40	3.00	55	2.87	44	3.09	60	3.26
52	2.86	56	2.86	123	2.62	66	3.18
41	3.00	57	2.85	77	2.92	68	3.17
56	2.80	53	2.90	17	3.30	65	3.22
61	2.73	49	2.93	26	3.21	49	3.43
53	2.86	39	3.14	80	2.91	43	3.56
57	2.80	48	2.96	101	2.79	51	3.40
39	3.00	45	3.00	2	3.67	76	3.00
64	2.70	74	2.60	60	3.00	50	3.40
60	2.73	67	2.70	59	3.00	80	3.00
88	2.43	60	2.83	30	3.20	105	2.80
49	2.94	65	2.77	126	2.58	72	3.10
68	2.67	59	2.83	29	3.20	45	3.50
54	2.83	87	2.46	49	3.08	48	3.45
55	2.83	50	2.92	58	3.00	67	3.17
70	2.65	69	2.65	19	3.27	70	3.14
78	2.53	61	2.82	74	2.94	73	3.06
65	2.70	62	2.80	41	3.11	71	3.10
63	2.71	76	2.57	90	2.86	88	2.93
74	2.59	79	2.54	115	2.68	75	3.03
71	2.64	89	2.45	12	3.36	59	3.27
73	2.63	68	2.67	38	3.13	63	3.23
89	2.43	78	2.57	48	3.08	90	2.89
90	2.41	81	2.53	21	3.25	55	3.31
120	2.13	66	2.71	37	3.13	78	3.00
79	2.50	90	2.43	65	3.00	64	3.23
104	2.31	73	2.62	108	2.75	89	2.92
46	3.00	99	2.33	67	3.00	132	2.50
66	2.69	125	2.00	75	2.93	106	2.80
84	2.45	77	2.57	103	2.78	82	3.00
91	2.41	91	2.41	86	2.88	93	2.88
82	2.47	80	2.53	27	3.21	74	3.05
86	2.44	71	2.63	81	2.91	86	2.94
77	2.55	100	2.33	3	3.63	56	3.29
109	2.25	85	2.50	64	3.00	57	3.29
72	2.64	83	2.50	62	3.00	117	2.67
81	2.50	92	2.38	66	3.00	100	2.83
103	2.33	88	2.46	50	3.08	54	3.33
98	2.37	105	2.29	9	3.41	77	3.00
75	2.56	54	2.89	24	3.22	107	2.78
101	2.33	84	2.50	63	3.00	99	2.83
76	2.56	126	2.00	39	3.13	79	3.00
85	2.45	75	2.58	47	3.08	113	2.69

Table A1 Country rankings on the Logistics Performance Index and indicators (continued)

Country	Logistics Performance Index			Customs		Infrastructure		International shipments	
	LPI rank	Score	Confidence interval	Rank	Score	Rank	Score	Rank	Score
Nigeria	93	2.40	0.09	94	2.23	92	2.23	92	2.49
Morocco	94	2.38	0.22	101	2.20	77	2.33	64	2.75
Papua New Guinea	95	2.38	0.24	127	2.00	123	2.00	80	2.57
Dominican Republic	96	2.38	0.10	82	2.33	97	2.18	107	2.34
Egypt, Arab Rep.	97	2.37	0.24	119	2.08	119	2.00	111	2.33
Lebanon	98	2.37	0.31	106	2.17	102	2.14	88	2.50
Russian Federation	99	2.37	0.06	136	1.94	93	2.23	94	2.48
Zambia	100	2.37	0.27	120	2.08	120	2.00	102	2.40
Senegal	101	2.37	0.18	76	2.38	108	2.09	130	2.09
Côte d'Ivoire	102	2.36	0.23	98	2.22	94	2.22	127	2.13
Kyrgyz Republic	103	2.35	0.14	102	2.20	112	2.06	106	2.35
Ethiopia	104	2.33	0.21	109	2.14	135	1.88	97	2.43
Liberia	105	2.31	0.23	72	2.40	101	2.14	57	2.83
Moldova	106	2.31	0.19	110	2.14	128	1.94	105	2.36
Bolivia	107	2.31	0.12	128	2.00	111	2.08	99	2.42
Lesotho	108	2.30	0.35	73	2.40	115	2.00	89	2.50
Mali	109	2.29	0.14	107	2.17	132	1.90	119	2.23
Mozambique	110	2.29	0.18	95	2.23	109	2.08	118	2.25
Azerbaijan	111	2.29	0.22	96	2.23	116	2.00	90	2.50
Yemen, Rep.	112	2.29	0.19	105	2.18	110	2.08	123	2.20
Burundi	113	2.29	0.36	103	2.20	62	2.50	84	2.50
Zimbabwe	114	2.29	0.21	138	1.92	136	1.87	114	2.27
Serbia and Montenegro	115	2.28	0.13	83	2.33	98	2.18	116	2.25
Guinea-Bissau	116	2.28	0.23	111	2.14	89	2.25	120	2.22
Lao PDR	117	2.25	0.21	121	2.08	121	2.00	103	2.40
Jamaica	118	2.25	0.11	80	2.35	113	2.03	128	2.13
Togo	119	2.25	0.20	117	2.10	90	2.25	101	2.40
Madagascar	120	2.24	0.15	93	2.24	107	2.13	117	2.25
Burkina Faso	121	2.24	0.23	115	2.13	133	1.89	71	2.67
Nicaragua	122	2.21	0.14	112	2.14	137	1.86	124	2.18
Haiti	123	2.21	0.13	122	2.08	103	2.14	122	2.20
Eritrea	124	2.19	0.26	113	2.14	117	2.00	135	2.00
Ghana	125	2.16	0.25	129	2.00	91	2.25	115	2.25
Namibia	126	2.16	0.28	114	2.14	118	2.00	125	2.14
Somalia	127	2.16	0.22	68	2.43	147	1.63	141	1.88
Bhutan	128	2.16	0.13	134	1.95	127	1.95	134	2.06
Uzbekistan	129	2.16	0.14	137	1.94	124	2.00	133	2.07
Nepal	130	2.14	0.17	141	1.83	144	1.77	131	2.09
Armenia	131	2.14	0.23	118	2.10	142	1.78	140	2.00
Mauritius	132	2.13	0.25	130	2.00	84	2.29	121	2.20
Kazakhstan	133	2.12	0.13	139	1.91	138	1.86	129	2.10
Gabon	134	2.10	0.36	92	2.25	69	2.40	147	1.67
Syrian Arab Republic	135	2.09	0.20	108	2.17	131	1.91	138	2.00
Mongolia	136	2.08	0.20	131	2.00	129	1.92	91	2.50
Tanzania	137	2.08	0.17	123	2.07	122	2.00	132	2.08
Solomon Islands	138	2.08	0.19	144	1.73	126	2.00	104	2.36

Logistics competence		Tracking & tracing		Domestic logistics costs		Timeliness	
Rank	Score	Rank	Score	Rank	Score	Rank	Score
95	2.38	97	2.36	83	2.90	114	2.69
119	2.13	130	2.00	133	2.38	95	2.86
105	2.29	106	2.29	7	3.43	69	3.14
108	2.25	107	2.28	54	3.05	91	2.89
96	2.38	72	2.62	94	2.83	96	2.85
93	2.40	101	2.33	11	3.40	115	2.67
83	2.46	119	2.17	131	2.40	87	2.94
87	2.44	64	2.80	43	3.10	130	2.50
62	2.73	103	2.30	45	3.09	123	2.63
97	2.38	128	2.00	68	3.00	61	3.25
100	2.35	93	2.38	99	2.80	109	2.76
129	2.00	141	1.83	34	3.17	37	3.67
127	2.00	132	2.00	31	3.20	134	2.43
112	2.21	86	2.50	78	2.92	111	2.73
117	2.17	95	2.38	127	2.53	104	2.81
115	2.20	140	1.83	6	3.50	98	2.83
114	2.21	94	2.38	53	3.05	92	2.88
99	2.36	129	2.00	95	2.83	101	2.83
128	2.00	96	2.38	87	2.88	124	2.63
111	2.22	104	2.30	116	2.67	108	2.78
80	2.50	127	2.00	137	2.33	148	2.00
113	2.21	70	2.64	134	2.36	97	2.85
107	2.29	124	2.07	51	3.07	128	2.54
132	2.00	114	2.22	35	3.14	94	2.86
106	2.29	139	1.89	146	2.13	102	2.83
125	2.07	112	2.24	5	3.50	119	2.65
94	2.40	115	2.20	14	3.33	145	2.11
131	2.00	118	2.19	28	3.21	116	2.67
102	2.33	122	2.13	118	2.67	143	2.25
92	2.41	116	2.19	55	3.04	131	2.50
121	2.11	121	2.16	104	2.78	125	2.60
69	2.67	82	2.50	61	3.00	149	1.83
146	1.75	110	2.25	149	2.00	133	2.50
142	1.83	142	1.83	125	2.60	83	3.00
110	2.25	144	1.75	71	3.00	81	3.00
116	2.18	108	2.27	13	3.36	126	2.57
118	2.15	123	2.08	82	2.91	112	2.73
124	2.08	102	2.33	22	3.25	110	2.75
122	2.11	113	2.22	8	3.43	122	2.63
147	1.75	111	2.25	117	2.67	137	2.33
126	2.05	117	2.19	96	2.81	120	2.65
136	2.00	134	2.00	109	2.75	136	2.33
145	1.80	137	2.00	84	2.89	118	2.67
144	1.80	136	2.00	70	3.00	142	2.25
138	1.92	120	2.17	15	3.33	140	2.27
123	2.10	131	2.00	111	2.73	139	2.30

Table A1 Country rankings on the Logistics Performance Index and indicators (continued)

Country	Logistics Performance Index			Customs		Infrastructure		International shipments	
	LPI rank	Score	Confidence interval	Rank	Score	Rank	Score	Rank	Score
Albania	139	2.08	0.17	132	2.00	78	2.33	109	2.33
Algeria	140	2.06	0.22	148	1.60	139	1.83	139	2.00
Guyana	141	2.05	0.15	135	1.95	143	1.78	144	1.80
Chad	142	1.98	0.16	133	2.00	141	1.80	142	1.83
Niger	143	1.97	0.23	145	1.67	149	1.40	145	1.80
Sierra Leone	144	1.95	0.21	149	1.58	140	1.83	143	1.82
Djibouti	145	1.94	0.16	146	1.64	130	1.92	137	2.00
Tajikistan	146	1.93	0.19	140	1.91	125	2.00	136	2.00
Myanmar	147	1.86	0.17	124	2.07	145	1.69	146	1.73
Rwanda	148	1.77	0.13	143	1.80	148	1.53	148	1.67
Timor-Leste	149	1.71	0.23	147	1.63	146	1.67	149	1.50
Afghanistan	150	1.21	0.10	150	1.30	150	1.10	150	1.22

Logistics competence		Tracking & tracing		Domestic logistics costs		Timeliness	
Rank	Score	Rank	Score	Rank	Score	Rank	Score
130	2.00	145	1.67	105	2.78	144	2.13
139	1.92	109	2.27	33	3.17	103	2.82
137	1.95	98	2.35	4	3.50	129	2.50
143	1.82	138	1.91	1	4.00	127	2.56
134	2.00	133	2.00	150	1.67	85	3.00
140	1.91	135	2.00	69	3.00	121	2.64
133	2.00	143	1.82	100	2.80	138	2.30
141	1.90	146	1.67	138	2.33	146	2.11
135	2.00	149	1.57	79	2.92	147	2.08
148	1.67	148	1.60	52	3.07	135	2.38
149	1.60	147	1.67	16	3.33	141	2.25
150	1.25	150	1.00	40	3.13	150	1.38

Table A2 Country-specific environment and institutions data averages, by income group and region

Question	Logistics Performance Survey question	Income group				Region					
		High income non-OECD & non OECD	Low income	Lower middle income	Upper middle income	East Asia & Pacific	Europe & Central Asia	Latin America & the Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
<i>Based on your experience in international logistics, please select the options that best describe the logistics operational environment in your country of work</i>		Percent of respondents answering high/very high									
1	Port/Airport charges are	47	54	47	42	47	48	53	39	45	48
2	Overall, logistics costs (e.g., port charges, domestic transport, agent fees), are	46	60	46	31	40	23	58	47	41	59
3	Warehousing service charges are	38	43	41	27	17	25	55	15	47	45
4	Rail transport rates are	43	28	24	24	25	24	14	36	33	30
5	Less-than-full truck load services rates are	33	61	36	31	38	30	33	38	56	61
6	Full truck load rates are	27	59	39	21	39	21	34	32	34	68
<i>Evaluate the quality of infrastructure in use for logistics operations in your country of work</i>		Percent of respondents answering low/very low									
27	Telecommunications infrastructure and services	6	44	29	11	35	20	28	15	11	43
28	Fixed transport infrastructure (e.g., ports, roads, warehouses)	17	52	53	34	46	44	46	51	34	54
<i>Evaluate the effectiveness and efficiency of the following processes in your country of work</i>		Percent of respondents answering high/very high									
29	Do traders demonstrating high levels of compliance receive expedited customs clearance?	54	25	40	52	41	51	42	42	57	17
32	Can customs declarations be submitted and processed electronically?	70	42	49	60	28	46	58	53	50	55
33	Do you receive adequate and timely information when regulations change?	62	27	35	45	41	43	44	30	24	23
34	Is customs clearance a transparent process?	73	26	39	48	25	44	47	47	33	26
35	Are export shipments cleared and shipped as scheduled?	95	56	63	82	89	76	70	65	62	46
36	Are import shipments cleared and delivered as scheduled?	80	24	36	73	44	75	40	42	32	22
<i>Evaluate the level of competence of the following professions in your country of work</i>		Percent of respondents answering high/very high									
37	Trade and transport related associations	46	14	17	18	18	19	15	10	15	16
38	Other border crossing-related government agencies	33	5	13	16	11	13	13	10	3	12
39	Customs agencies	52	10	22	30	20	30	19	40	17	8
40	Freight forwarders	59	23	30	45	31	51	27	38	42	16
41	Consignees or shippers	40	14	21	24	25	30	13	32	23	10
42	Warehousing and distribution operators	51	13	13	30	16	30	17	13	16	12
43	Air transport service providers	62	26	27	48	38	40	34	38	36	20
44	Rail transport service providers	24	8	13	15	23	24	10	17	5	0
45	Road transport service providers	50	12	16	34	22	39	11	38	16	8
46	Customs brokers	55	14	23	47	29	42	33	27	25	8
<i>Evaluate the evolution of the following factors in your country of work, over the past 3 years</i>		Percent of respondents answering better/much better									
47	Overall business environment	57	39	63	62	44	66	61	68	64	38
48	Good governance and eradication of corruption	44	23	36	36	26	39	35	58	18	22
49	Regulatory regime	33	23	37	35	27	39	43	29	28	20
50	Availability of private sector services	58	54	73	75	54	82	70	81	78	51
51	Quality of telecommunications infrastructure	85	62	70	79	47	89	65	98	71	62

Table A2 Country-specific environment and institutions data averages, by income group and region (continued)

Question	Logistics Performance Survey question	Income group				Region					
		High income non-OECD & non OECD	Low income	Lower middle income	Upper middle income	East Asia & Pacific	Europe & Central Asia	Latin America & the Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
52	Quality of transport infrastructure	56	36	41	55	41	57	38	67	40	33
53	Other border crossing-related government agencies clearance procedures	43	34	36	51	26	62	28	38	30	42
54	Customs clearance procedures	65	41	60	69	38	69	58	70	60	48
<i>Evaluate the incidence on your activity of the following constraints in your country of work</i>					Percent of respondents answering high/very high						
55	Solicitation of informal payments	10	54	40	16	30	24	36	21	39	58
56	Criminal activities (e.g., stolen cargo)	6	19	14	9	5	0	24	6	19	22
57	Major delays due to pre-shipment inspection	19	53	33	14	20	12	43	35	17	56
58	Major delays due to compulsory warehousing	13	18	20	14	10	9	30	25	19	14

Note: For each survey question, responses have been aggregated at the individual country level. A simple average of country aggregates within the group was then calculated. The results are reported in percentages. The scale used for this set of questions had five options ranging from "very high" to "very low."

Table A3 Country-specific performance data, by country

Logistics Performance Survey question										
Country	Rate of physical inspection (percent)	Customs clearance ^a (days)	Lead time ^b export, median case (days)	Lead time ^c import, best case (days)	Lead time ^d import, median case (days)	Number of border agencies exports	Number of border agencies imports	Possibility of a review procedure ^e (percent)	Typical charge ^f for a 40-foot export container or a semi-trailer (US\$)	Typical charge for a 40-foot import container or a semi-trailer (US\$)
Afghanistan	100	3.8	8.1	14.0	20.7	2.3	3.3	33	1,260	1,817
Angola	36	5.8	7.9	4.6	10.6	3.7	3.7	0	3,873	1,957
Argentina	19	1.6	3.0	2.4	4.1	3.3	2.9	8	487	634
Australia	3	1.7	3.5	2.5	3.4	1.5	2.3	100	562	562
Austria	3	0.7	2.2	1.5	3.3	3.7	3.8	25	1,000	1,000
Bahrain	22	2.2	2.0	2.0	2.0	2.0	2.0	100	500	500
Bangladesh	31	4.1	2.3	3.0	4.5	2.0	2.3	33	211	397
Belgium	3	1.0	1.4	2.0	3.5	2.0	2.0	33	500	500
Benin	100	10.0	3.0	10.0	7.0	6.0	6.0	0	1,000	1,000
Bolivia	6	0.5	4.0	3.0	4.0	1.0	1.0	100	2,000	2,000
Bosnia and Herzegovina	50	1.0	2.0	1.0	1.0	4.0	4.0	0	500	500
Brazil	13	5.8	3.4	3.1	7.0	5.7	6.0	0	909	1,145
Bulgaria	4	1.0	1.0	1.0	1.0	2.0	2.5	100	150	150
Cambodia	12	1.0	2.7	1.4	3.3	3.7	3.7	50	335	422
Cameroon	3	2.4	5.9	3.2	10.0	5.0	6.0	50	1,000	1,225
Canada	2	0.8	2.6	2.2	4.0	2.7	3.8	80	627	757
Central African Republic	100	7.0	7.0	7.0	30.0	4.0	4.0	0	5,000	5,000
Chad	100	3.0	11.0	11.0	35.0	5.0	5.0	0	6,000	6,000
Chile	4	1.0	2.8	1.0	3.2	2.5	2.5	0	274	274
China	7	1.4	2.6	2.4	3.8	4.0	3.9	36	380	388
Colombia	35	7.0	7.0	4.0	7.0	2.0	2.0	0	2,000	2,000
Congo, Dem. Rep.	100	4.0	14.0	8.0	18.0	0.0	8.0	0	2,000	5,000
Costa Rica	11	1.7	4.0	4.0	4.0	3.0	3.0	0	1,000	1,000
Croatia	12	0.9	4.3	1.6	2.9	2.4	2.8	50	309	344
Cyprus	22	1.0	1.0	2.0	2.0	3.0	3.0	50	274	500
Czech Republic	1	0.8	4.8	3.7	5.4	3.0	2.8	100	1,000	794
Denmark	1	0.7	1.3	1.3	1.3	2.0	1.8	100	315	315
Dominican Republic	75	4.6	1.0	1.0	1.0	1.0	5.5	0	250	250
Ecuador	66	2.6	8.9	11.4	8.9	3.0	3.0	0	707	707
Egypt	51	2.5	4.0	3.4	5.8	4.5	4.3	71	237	445
El Salvador	1	1.0	2.0	1.0	2.0	2.0	5.0	0	1,000	1,000
Estonia	2	0.5	1.3	1.3	2.3	2.3	2.3	100	211	422
Finland	2	0.8	2.3	1.5	2.6	2.2	2.1	92	434	480
France	7	1.6	3.2	3.4	4.5	4.8	5.0	100	1,189	1,189
Germany	2	0.7	2.3	1.6	2.4	2.8	3.7	100	806	806
Greece	4	1.0	3.0	1.4	3.5	1.5	2.5	0	500	500
Guinea	22	2.2	3.5	1.4	3.9	3.0	3.0	0	500	500
Haiti	25	3.9	4.2	3.5	5.3	3.0	3.5	100	671	474
Honduras	6	1.4	2.4	1.7	3.2	2.5	3.0	0	707	866
Hong Kong, China	2	0.6	1.9	1.3	2.4	2.5	3.7	67	561	654
Hungary	5	0.8	3.5	3.0	4.7	3.0	3.3	50	1,145	909
India	25	2.4	4.0	4.0	4.7	2.9	2.4	39	601	619
Indonesia	12	1.6	2.5	1.9	3.9	2.7	2.7	38	266	244

Table A3 Country-specific performance data, by country (continued)

Country	Logistics Performance Survey question									
	Rate of physical inspection (percent)	Customs clearance ^a (days)	Lead time ^b export, median case (days)	Lead time ^c import, best case (days)	Lead time ^d import, median case (days)	Number of border agencies exports	Number of border agencies imports	Possibility of a review procedure ^e (percent)	Typical charge ^f for a 40-foot export container or a semi-trailer (US\$)	Typical charge for a 40-foot import container or a semi-trailer (US\$)
Iran	87	1.0	4.0	2.0	3.5	3.5	2.5	0	500	707
Ireland	1	0.8	1.8	1.0	2.3	1.7	1.7	50	266	266
Israel	2	1.4	5.3	2.0	8.7	5.0	6.0	100	1,000	2,000
Italy	5	1.3	2.3	1.6	3.5	6.7	10.0	100	335	531
Jamaica	18	3.0	10.0	6.0	10.0	6.0	5.0	100		
Japan	3	1.4	3.0	1.3	2.7	3.0	3.0	100	721	630
Jordan	22	1.8	2.0	2.0	4.6	3.3	3.7	33	707	1,000
Kazakhstan	18	7.1	2.8	2.0	11.5	2.0	7.5	50	194	194
Kenya	28	4.0	5.8	4.7	10.0	3.3	4.4	25	1,176	1,719
Kuwait	45	2.0	4.5	2.3	3.4	2.4	2.6	25	355	490
Latvia	4	0.7	2.3	1.7	2.4	2.8	3.0	67	211	287
Lebanon	42	2.0	2.4	1.4	2.4	1.5	2.0	0	354	500
Liberia	50	3.0	4.0	2.0	5.0	5.0	5.0	0	500	500
Lithuania	14	4.2	4.5	1.0	4.5	3.5	7.5	100	354	354
Malawi	3	1.0	4.2	2.6	3.7	1.5	1.5	100	387	548
Malaysia	6	1.7	3.4	1.7	3.3	2.5	3.3	75	783	658
Maldives	50	0.5	1.0	1.0	1.0	2.0	2.0	0		
Mali	75	3.0	12.0	14.0	18.0	3.0	3.0	0	3,000	3,000
Mauritius	18	0.7	3.0	2.0	2.4	2.0	5.0	100	194	250
Mexico	10	1.3	3.9	2.4	4.4	3.3	3.4	0	552	511
Morocco	10	1.0	4.0	4.0	10.0	3.0	3.0	100	300	500
Myanmar	56	4.5	2.6	2.2	3.2	3.7	3.7	0	150	150
Namibia	18	1.0	3.0	3.0	4.0	3.0	6.0	0	1,000	1,000
Nepal	12	1.4	4.9	8.0	8.7	5.3	4.3	33	1,817	2,621
Netherlands	3	0.6	2.6	1.6	2.6	2.9	1.7	80	298	364
New Zealand	5	0.5	1.9	1.4	2.2	2.3	2.8	0	224	224
Nicaragua	18	1.0	2.0	2.0	2.0	1.0	1.0	0	3,000	2,000
Nigeria	72	8.1	9.9	8.4	11.2	7.5	7.5	0	1,732	2,449
Norway	2	0.5	2.2	2.2	3.4	2.3	2.0	60	660	562
Pakistan	10	2.4	3.2	2.7	3.7	3.2	2.9	60	382	444
Panama	18	1.7	3.2	2.8	4.9	2.5	2.5	50	354	274
Paraguay	100	5.0	1.0	4.0	4.0	0.0	10.0	0	1,000	1,000
Peru	7	1.6	1.7	2.7	4.4	3.3	3.2	25	420	707
Philippines	32	1.8	6.3	3.7	5.3	4.0	4.0	50	721	794
Poland	3	3.2	3.0	2.0	3.0	3.0	4.0	0	2,000	1,000
Portugal	3	1.7	2.5	2.5	5.0	2.0	2.3	50	335	500
Qatar	100	3.9	1.0	1.0	1.0	3.0	3.0	50		
Romania	24	1.2	2.2	1.4	3.0	4.0	3.5	25	783	794
Russian Federation	20	1.4	2.8	2.0	3.0	4.0	4.5	0	1,565	1,732
Saudi Arabia	32	3.9	4.3	3.6	6.6	2.0	1.8	50	224	335
Senegal	36	4.2	4.0	2.3	5.2	4.0	4.0	33	500	825
Serbia Montenegro	4	0.5	2.0	2.0	3.0	2.0	1.5	0	3,000	5,000
Sierra Leone	75	10.0	10.0	7.0	18.0	3.0	3.0	0	1,000	500

Table A3 Country-specific performance data, by country (continued)

Logistics Performance Survey question										
Country	Rate of physical inspection (percent)	Customs clearance ^a (days)	Lead time ^b export, median case (days)	Lead time ^c import, best case (days)	Lead time ^d import, median case (days)	Number of border agencies exports	Number of border agencies imports	Possibility of a review procedure ^e (percent)	Typical charge ^f for a 40-foot export container or a semi-trailer (US\$)	Typical charge for a 40-foot import container or a semi-trailer (US\$)
Singapore	3	1.1	2.4	1.2	2.2	1.5	1.7	67	311	311
Slovak Republic	6	0.8	2.6	2.2	3.0	2.3	2.0	100	707	707
Slovenia	3	1.0	3.7	2.0	3.9	4.0	2.5	100	500	500
Solomon Islands	50	4.0	9.0	5.0	11.0	10.0	10.0	100		
South Africa	2	1.9	2.2	1.9	4.0	4.5	3.2	60	619	515
South Korea	1	1.0	2.0	1.8	2.7	2.3	2.7	67	630	630
Spain	3	1.5	2.6	1.7	3.1	5.2	5.2	33	595	595
Sri Lanka	20	1.8	1.9	1.9	2.5	2.4	2.8	20	245	263
Sweden	1	0.7	1.9	1.7	2.6	2.6	3.4	80	758	794
Switzerland	2	0.5	1.6	2.1	3.8	3.3	4.0	33	1,225	1,225
Taiwan, China	11	1.0	2.0	1.4	3.0	3.0	6.0	50	1,000	707
Tanzania	22	7.8	11.2	11.2	21.2	2.3	3.5	0	354	612
Thailand	9	1.9	3.4	1.4	2.3	4.3	4.3	0	422	422
Tunisia	61	3.0	5.9	2.4	10.0	3.5	6.5	50	500	500
Turkey	10	1.9	2.5	1.5	2.4	5.0	4.8	40	917	1,286
Uganda	61	4.5	14.0	10.0	14.0	2.0	2.0	100	3,000	3,000
Ukraine	40	1.0	2.4	2.0	2.4	4.7	5.3	67	250	500
United Arab Emirates	3	0.9	3.5	2.2	4.1	3.6	3.6	71	291	298
United Kingdom	3	0.8	3.3	3.2	3.4	4.2	4.1	75	777	1,147
United States	3	1.1	3.6	2.5	3.9	2.9	3.2	64	861	1,008
Uruguay	11	1.7	5.0	2.2	5.0	2.5	3.5	100	671	671
Venezuela	38	4.4	4.7	4.9	6.4	2.4	3.6	0	715	490
Vietnam	14	1.4	2.8	2.6	4.0	4.5	4.0	57	194	294
Zambia	44	2.0	9.2	5.2	9.9	2.0	2.0	67	4,217	5,000
Zimbabwe	50	2.0	25.0	14.0	18.0	3.0	2.0	100	4,000	4,000

a. Time taken between the submission of an accepted customs declaration and customs clearance.

b. From shipper to port of loading, median case = 50 percent of shipments.

c. From port of discharge to consignee, best case = 10 percent of shipments.

d. From port of discharge to consignee, median case = 50 percent of shipments.

e. The percentages reported in this column represent the proportion of respondents answering that a simple and inexpensive review procedure is available.

f. Total cost to transport and port services.

Note: Country-specific data is not available for all 150 countries in the index. Blank cells indicate no data available.

What is the Logistics Performance Index?

Based on a worldwide survey of global freight forwarders and express carriers, the Logistics Performance Index is a benchmarking tool developed by the World Bank that measures performance along the logistics supply chain within a country. Allowing for comparisons across 150 countries, the index can help countries identify challenges and opportunities and improve their logistics performance.

Technological progress and worldwide trade and investment liberalization are presenting new opportunities for countries to harness global markets for growth and poverty reduction. But with the advent of global supply chains, a new premium is being placed on being able to move goods from A to B rapidly, reliably, and cheaply. Countries able to connect to the global logistics web have access to vast new markets; but those whose links are weak face the large and growing costs of exclusion.



Logistics Performance Index



International Federation
for Freight Forwarders
Associations



Global Facilitation Partnership for Transportation and Trade



TURKU SCHOOL OF ECONOMICS



THE WORLD BANK

Trade facilitation has been recognized as key to economic development, but research on this topic has suffered from a lack of good quantitative measures. By introducing a comprehensive new index of logistics performance, **Connecting to Compete: Trade Logistics in the Global Economy** makes an important contribution to the literature and offers new insights into the factors limiting the globalization gains accruing to the poorest countries of the world.

Thomas W. Hertel
Distinguished Professor and Executive Director
Center for Global Trade Analysis, Purdue University

The establishment of the Logistics Performance Index underlines the importance of logistics in a globalized world. The index delivers a comprehensive and consistent view on the different national logistics markets and supports the process of continual improvement of service levels related to logistics.

Klaus-Michael Kuehne, Executive Chairman
Kuehne + Nagel International AG

For developing countries such as Pakistan, there is need of such studies that give some indication and guidance on how and what countries should improve to become competitive and reach the level of developed countries. We were glad to be able to contribute to this important initiative of the World Bank.

Muhammad Khalid Paracha, Managing Director
MAP Enterprises, Karachi, Pakistan