**2023**

Connecting to

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Trade Logistics in the Global Economy



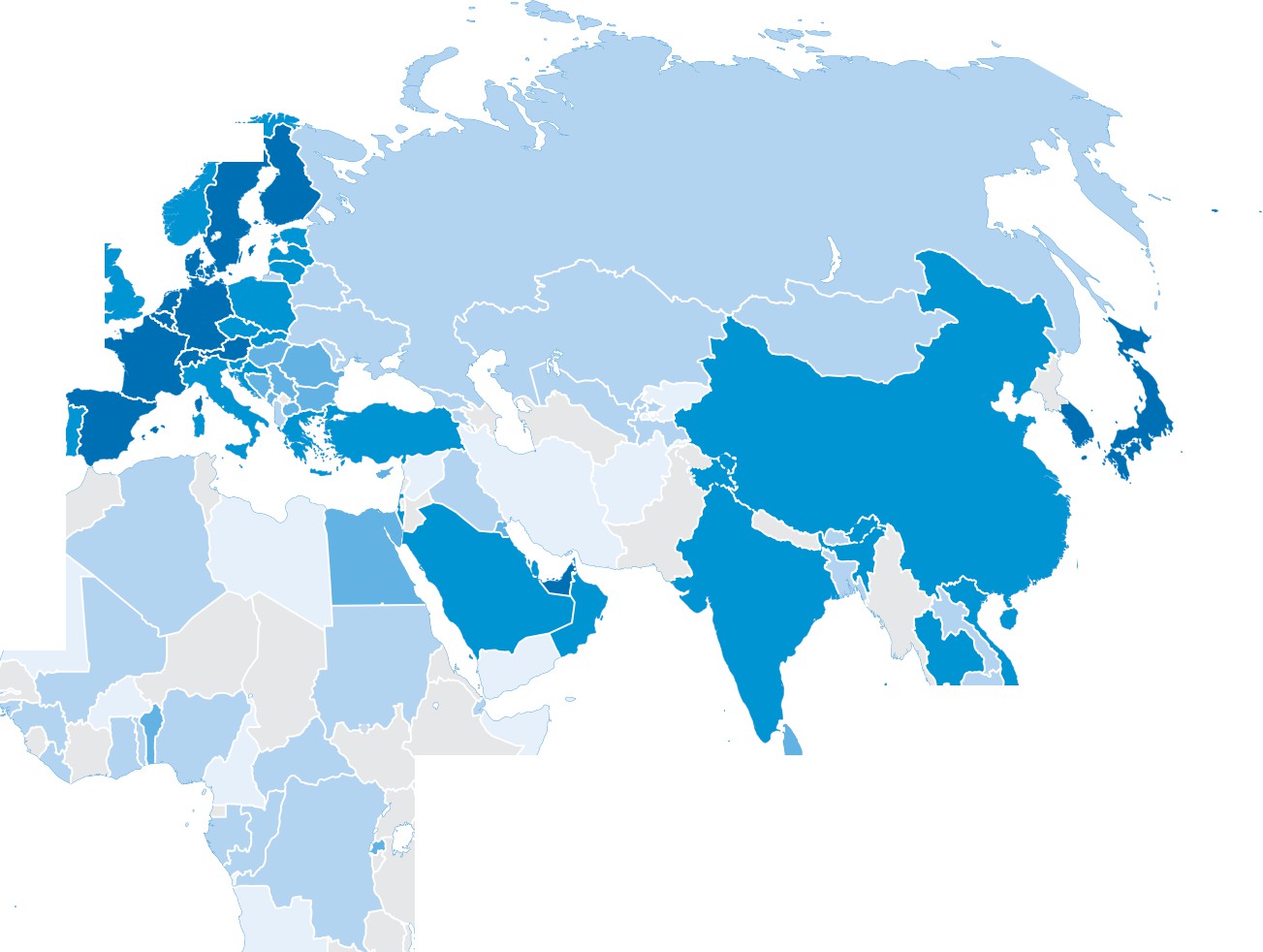
The Logistics Performance Index and Its Indicators

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**LOGISTICS PERFORMANCE INDEX:**

1.9-2.4

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3.3-3.8

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**Connecting to Compete 2023**

# Trade Logistics in an Uncertain Global Economy

The Logistics Performance Index and Its Indicators

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# Table of contents

[Acknowledgements vi](#_bookmark0)

[Abbreviations vii](#_bookmark1)

[Key messages ix](#_bookmark2)

[Policy highlights x](#_bookmark3)i

[Executive summary 1](#_bookmark5)

[Key changes in global supply chains since 2018 and implications for the 2023](#_bookmark11) [Logistics Performance Index 7](#_bookmark11)

[Understanding logistics performance and its determinants is now more important than](#_bookmark11)

[ever 7](#_bookmark11)

[Container shipping disruptions in 2020–22 7](#_bookmark11)

[Air freight market disruptions in 2020–22 9](#_bookmark13)

[The rapid emergence of e-commerce as an important channel for cross-border trade 9](#_bookmark13)

[The 2023 LPI measures structural factors of performance rather than supply chain](#_bookmark13) [disruptions 9](#_bookmark13)

[The 2023 Logistics Performance Index 11](#_bookmark14)

[How to interpret the LPI 11](#_bookmark14)

[Features of the 2023 survey 11](#_bookmark14)

[Key findings of the 2023 LPI survey 12](#_bookmark16)

[The dynamics of LPI scores over 2012–23 15](#_bookmark19)

[What is the impact of the supply chain crisis? 15](#_bookmark19)

[Logistics performance is determined by more than income 15](#_bookmark19)

[Supply chain lead time around the world: Where are the delays? 17](#_bookmark21)

[Lead time dispersion and supply chain reliability 17](#_bookmark21)

[Dwell time and logistics performance 21](#_bookmark25)

[What causes long port delays? 22](#_bookmark27)

[Which interventions help reduce these delays? 24](#_bookmark30)

[Logistical constraints in landlocked developing countries 24](#_bookmark30)

[Connectivity and logistics performance in small maritime economies 25](#_bookmark32)

[Conclusions 27](#_bookmark34)

[Global supply chains have turned out to be surprisingly resilient during the recent](#_bookmark34) [disruptions 27](#_bookmark34)

[The top and bottom performers: Performance is steady or improving, but the gap](#_bookmark34) [persists 27](#_bookmark34)

[Consistency is an important driver of logistics performance 27](#_bookmark34)

Table of contents

[Logistics performance and key performance indicators derived from a Big Data approach 28](#_bookmark36)

[Policymaking priorities when managing logistics as a sector of the economy 28](#_bookmark36)

[The 2020s is a decade of transformation for global supply chains 29](#_bookmark37)

[Notes 31](#_bookmark39)

Appendix 1

[2023 LPI results 32](#_bookmark40)

Appendix 2

[Lead time data from supply chain tracking datasets 36](#_bookmark41)

Appendix 3

[Top and bottom scorers on the LPI, overall and by income group 52](#_bookmark45)

Appendix 4

[Description of the new data sources for the LPI 2023 55](#_bookmark48)

Appendix 5

[The LPI methodology 62](#_bookmark49)

Appendix 6

[Results from the LPI survey question on demand for environmentally sustainable shipping options and on changes](#_bookmark50) [in global supply chains since 2019 65](#_bookmark50)

Appendix 7

[Respondent demographics 67](#_bookmark51)

Appendix 8

[LPI results in research and policymaking literature 69](#_bookmark52)

[References 73](#_bookmark53)

Boxes

|  |  |  |
| --- | --- | --- |
| 1.1 | Vaccine logistics 8 |  |
| 1.2 | The 2023 LPI survey question on supply chain disruptions 10 |
| 2.1 | The six components of the LPI 12 |
| 2.2 | How precise are LPI scores? 13 |
| 3.1 | Measuring performance using tracking indicators: Sources and definitions | 19 |
| 3.2 | India: Boosting performance with supply chain digitalization 22 |  |

Figures

1. Distribution of LPI scores, 2012–23 2
2. Dispersion of time spent at port: Long tail distribution of containers in the port of Algiers, Algeria, May–October 2022 4
   1. Container shipping schedule reliability, average delay for late arrivals, and spot rates, June 2018–22 8
   2. Global air freight supply, demand, and prices, January 2018–July 2022 9
   3. Histogram of scores of the 139 countries and four performance groups in the 2023 LPI 14
   4. LPI component scores, by overall LPI quintile, 2023 15

Table of contents

|  |  |  |
| --- | --- | --- |
| 2.3 | Distribution of LPI scores, 2012–23 16 |  |
| 2.4 | Timeliness score, by LPI quintile, 2018 and 2023 16 |
| 2.5 | Distribution of 2023 LPI scores by income group 16 |
| 3.1 | Import lead time is the largest driver of variability in international shipping in 2022 20 |
| 3.2 | Examples of the distribution of import dwell time 20 |
| 3.3 | Dispersion of mean dwell time across the world 21 |
| 3.4 | Import and export dwell time of containers, May–October 2022, versus 2023 LPI score, by country 21 |
| 3.5 | Export dwell time versus import dwell time of container ports 23 |
| 3.6 | Outliers for import dwell time and comparators, May–October 2022 23 |
| 3.7 | The association between average connectivity in container shipping and 2023 LPI score quintiles 25 |
| 3.8 | The association between average inbound connectivity in aviation and postal services and 2023 LPI score quintiles | 26 |
| 3.9 | Most maritime economies have less than 20 shipping connections and depend on transshipment 26 |  |
| 4.1 | Demand for environmentally friendly shipping options, by destination LPI score quintile 30 |  |
| A4.1 | Cargo iQ milestones 56 |  |
| A4.2 | Country coverage of Cargo iQ dataset, by World Bank region 56 |  |
| A4.3 | Country coverage of the Universal Postal Union dataset, by World Bank region 58 |  |
| A4.4 | TradeLens data model 59 |  |
| A4.5 | The three phases of container trips 59 |  |
| A4.6 | Country coverage of the MDS Transmodal and MarineTraffic dataset, by World Bank region 60 |  |
| A7.1 | Number of respondents by location and country income group 67 |  |
| A7.2 | Respondents by transport mode and economic activity type 68 |  |
| A8.1 | Use of LPI data in research literature, 2007–22 69 |  |

Maps

1 Mean import dwell time of containers around the world, May–October 2022 5

A6.1 How often do shippers ask for environmentally friendly options (e.g., in view of emission levels, choice of routes, vehicles, schedules, etc.) when shipping to…? 65

A6.2 Based on your experience, how have supply chains been affected since the year 2019 when shipping to…? 66

Tables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | Top 10 and bottom 10 average LPI scores, 2007–23 (1, low, to 5, high) 2 |  |  | |
| 2.1  A2.1 [A2.2](#_bookmark42) [A2.3](#_bookmark43) A2.4 A2.5 [A2.6](#_bookmark44) [A3.1](#_bookmark45) | Bilateral LPI assessments in 2023, by income group 14  Lead time data for container shipping, 2022 36  [Lead time data for aviation, second quarter of 2022 38](#_bookmark42)  [Lead time data for postal parcels, 2019 41](#_bookmark43)  Import delays, May–October 2022 44  Import delays, May–October 2022 48  [Dwell times for landlocked developing countries, 2022 (days) 51](#_bookmark44)  [Top 12 LPI scorers in 2023 and their top scorer status for 2018, 2016, 2014, and 2012](#_bookmark45) | [52](#_bookmark45) |
| [A3.2](#_bookmark45) | [Bottom 12 LPI scorers in 2023 and their top scorer status for 2018, 2016, 2014, and 2012](#_bookmark45) |  | [52](#_bookmark45) | |
| [A3.3](#_bookmark46) | [Top 11 upper-middle-income LPI scorers in 2023 and their top scorer status in 2018, 2016, 2014, and 2012](#_bookmark46) | | | [53](#_bookmark46) |
| [A3.4](#_bookmark46) [A3.5](#_bookmark47) A4.1 A4.2 [A5.1](#_bookmark49) A5.2  A5.3 | [Top 13 lower-middle-income LPI scorers in 2023 and their top scorer status in 2018, 2016, 2014, and 2012](#_bookmark46)  [Top 10 low-income LPI scorers in 2023 and their top scorer status in 2018, 2016, 2014, and 2012 54](#_bookmark47)  The postal sequence of tracking messages 57  List of key performance indicators derived from tracking data 61  [Methodology for selecting country groups for survey respondents 62](#_bookmark49)  Results of principal component analysis for the 2023 international LPI score 63  Component loadings for the 2023 international LPI score 64 | | | [53](#_bookmark46) |

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**COVID-19** Coronavirus Disease 2019

**EDI** Electronic Data Interchange

**GDP** Gross Domestic Product

**LPI** Logistics Performance Index

**TIR** Transports Internationaux Routiers (Routiers, a road transit system)

**UN** United Nations

**UNLOCODE** United Nations Code for Trade and Transport Locations

**UPU** Universal Postal Union

**2023 LPI scores**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Economy** | **LPI**  **score** | **Customs score** | **Infra- structure score** | **Interna- tional shipments score** | **Logistics competence and quality score** | **Time- liness score** | **Tracking and tracing score** | **Economy** | **LPI**  **score** | **Customs score** | **Infra- structure score** | **Interna- tional shipments score** | **Logistics competence and quality score** | **Time- liness score** | **Tracking and tracing score** |
| Singapore | 4.3 | 4.2 | 4.6 | 4.0 | 4.4 | 4.3 | 4.4 | Mexico | 2.9 | 2.5 | 2.8 | 2.8 | 3.0 | 3.5 | 3.1 |
| Finland | 4.2 | 4.0 | 4.2 | 4.1 | 4.2 | 4.3 | 4.2 | Namibia | 2.9 | 2.8 | 2.8 | 3.0 | 2.9 | 2.9 | 2.8 |
| Denmark | 4.1 | 4.1 | 4.1 | 3.6 | 4.1 | 4.1 | 4.3 | Argentina | 2.8 | 2.7 | 2.8 | 2.7 | 2.7 | 3.1 | 2.9 |
| Germany | 4.1 | 3.9 | 4.3 | 3.7 | 4.2 | 4.1 | 4.2 | Montenegro | 2.8 | 2.6 | 2.5 | 2.8 | 2.8 | 3.2 | 3.2 |
| Netherlands | 4.1 | 3.9 | 4.2 | 3.7 | 4.2 | 4.0 | 4.2 | Rwanda | 2.8 | 2.5 | 2.9 | 2.4 | 3.0 | 3.1 | 3.0 |
| Switzerland | 4.1 | 4.1 | 4.4 | 3.6 | 4.3 | 4.2 | 4.2 | Serbia | 2.8 | 2.2 | 2.4 | 2.9 | 2.7 | 3.4 | 2.9 |
| Austria | 4.0 | 3.7 | 3.9 | 3.8 | 4.0 | 4.3 | 4.2 | Solomon Islands | 2.8 | 2.4 | 2.6 | 2.9 | 2.9 | 3.2 | 2.9 |
| Belgium | 4.0 | 3.9 | 4.1 | 3.8 | 4.2 | 4.2 | 4.0 | Sri Lanka | 2.8 | 2.5 | 2.4 | 2.8 | 2.7 | 3.3 | 3.0 |
| Canada | 4.0 | 4.0 | 4.3 | 3.6 | 4.2 | 4.1 | 4.1 | Bahamas, The | 2.7 | 2.7 | 2.5 | 3.1 | 2.5 | 3.0 | 2.6 |
| Hong Kong SAR, China | 4.0 | 3.8 | 4.0 | 4.0 | 4.0 | 4.1 | 4.2 | Belarus | 2.7 | 2.6 | 2.7 | 2.6 | 2.6 | 3.1 | 2.6 |
| Sweden | 4.0 | 4.0 | 4.2 | 3.4 | 4.2 | 4.2 | 4.1 | Djibouti | 2.7 | 2.6 | 2.3 | 2.5 | 2.8 | 3.6 | 2.7 |
| United Arab Emirates | 4.0 | 3.7 | 4.1 | 3.8 | 4.0 | 4.2 | 4.1 | El Salvador | 2.7 | 2.4 | 2.2 | 2.6 | 2.7 | 3.2 | 2.9 |
| France | 3.9 | 3.7 | 3.8 | 3.7 | 3.8 | 4.1 | 4.0 | Georgia | 2.7 | 2.6 | 2.3 | 2.7 | 2.6 | 3.1 | 2.8 |
| Japan | 3.9 | 3.9 | 4.2 | 3.3 | 4.1 | 4.0 | 4.0 | Kazakhstan | 2.7 | 2.6 | 2.5 | 2.6 | 2.7 | 2.9 | 2.8 |
| Spain | 3.9 | 3.6 | 3.8 | 3.7 | 3.9 | 4.2 | 4.1 | Papua New Guinea | 2.7 | 2.4 | 2.4 | 2.6 | 2.7 | 3.3 | 3.0 |
| Taiwan, China | 3.9 | 3.5 | 3.8 | 3.7 | 3.9 | 4.2 | 4.2 | Paraguay | 2.7 | 2.4 | 2.5 | 2.7 | 2.6 | 3.0 | 2.8 |
| Korea, Rep. | 3.8 | 3.9 | 4.1 | 3.4 | 3.8 | 3.8 | 3.8 | Ukraine | 2.7 | 2.4 | 2.4 | 2.8 | 2.6 | 3.1 | 2.6 |
| United States | 3.8 | 3.7 | 3.9 | 3.4 | 3.9 | 3.8 | 4.2 | Bangladesh | 2.6 | 2.3 | 2.3 | 2.6 | 2.7 | 3.0 | 2.4 |
| Australia | 3.7 | 3.7 | 4.1 | 3.1 | 3.9 | 3.6 | 4.1 | Congo, Rep. | 2.6 | 2.3 | 2.1 | 2.6 | 2.9 | 2.9 | 2.7 |
| China | 3.7 | 3.3 | 4.0 | 3.6 | 3.8 | 3.7 | 3.8 | Dominican Republic | 2.6 | 2.6 | 2.7 | 2.4 | 2.6 | 3.1 | 2.4 |
| Greece | 3.7 | 3.2 | 3.7 | 3.8 | 3.8 | 3.9 | 3.9 | Guatemala | 2.6 | 2.3 | 2.4 | 2.8 | 2.7 | 2.6 | 2.7 |
| Italy | 3.7 | 3.4 | 3.8 | 3.4 | 3.8 | 3.9 | 3.9 | Guinea-Bissau | 2.6 | 2.7 | 2.4 | 2.9 | 2.9 | 2.4 | 2.3 |
| Norway | 3.7 | 3.8 | 3.9 | 3.0 | 3.8 | 4.0 | 3.7 | Mali | 2.6 | 2.6 | 2.0 | 2.6 | 2.5 | 3.1 | 2.7 |
| South Africa | 3.7 | 3.3 | 3.6 | 3.6 | 3.8 | 3.8 | 3.8 | Nigeria | 2.6 | 2.4 | 2.4 | 2.5 | 2.3 | 3.1 | 2.7 |
| United Kingdom | 3.7 | 3.5 | 3.7 | 3.5 | 3.7 | 3.7 | 4.0 | Russian Federation | 2.6 | 2.4 | 2.7 | 2.3 | 2.6 | 2.9 | 2.5 |
| Estonia | 3.6 | 3.2 | 3.5 | 3.4 | 3.7 | 4.1 | 3.8 | Uzbekistan | 2.6 | 2.6 | 2.4 | 2.6 | 2.6 | 2.8 | 2.4 |
| Iceland | 3.6 | 3.7 | 3.6 | 3.3 | 3.5 | 3.6 | 3.7 | Albania | 2.5 | 2.4 | 2.7 | 2.8 | 2.3 | 2.5 | 2.3 |
| Ireland | 3.6 | 3.4 | 3.5 | 3.6 | 3.6 | 3.7 | 3.7 | Algeria | 2.5 | 2.3 | 2.1 | 3.0 | 2.2 | 2.6 | 2.5 |
| Israel | 3.6 | 3.4 | 3.7 | 3.5 | 3.8 | 3.8 | 3.7 | Armenia | 2.5 | 2.5 | 2.6 | 2.2 | 2.6 | 2.7 | 2.3 |
| Luxembourg | 3.6 | 3.6 | 3.6 | 3.6 | 3.9 | 3.5 | 3.5 | Bhutan | 2.5 | 2.7 | 2.2 | 2.3 | 2.6 | 2.6 | 2.3 |
| Malaysia | 3.6 | 3.3 | 3.6 | 3.7 | 3.7 | 3.7 | 3.7 | Central African Republic | 2.5 | 2.4 | 2.6 | 2.1 | 2.9 | 2.6 | 2.4 |
| New Zealand | 3.6 | 3.4 | 3.8 | 3.2 | 3.7 | 3.8 | 3.8 | Congo, Dem. Rep. | 2.5 | 2.3 | 2.3 | 2.5 | 2.4 | 2.8 | 2.5 |
| Poland | 3.6 | 3.4 | 3.5 | 3.3 | 3.6 | 3.9 | 3.8 | Ghana | 2.5 | 2.7 | 2.4 | 2.4 | 2.5 | 2.7 | 2.2 |
| Bahrain | 3.5 | 3.3 | 3.6 | 3.1 | 3.3 | 4.1 | 3.4 | Grenada | 2.5 | 2.6 | 2.5 | 2.6 | 2.2 | 3.1 | 2.3 |
| Latvia | 3.5 | 3.3 | 3.3 | 3.2 | 3.7 | 4.0 | 3.6 | Guinea | 2.5 | 2.4 | 2.4 | 2.2 | 2.7 | 2.5 | 2.7 |
| Qatar | 3.5 | 3.1 | 3.8 | 3.1 | 3.9 | 3.5 | 3.6 | Jamaica | 2.5 | 2.2 | 2.4 | 2.4 | 2.5 | 2.9 | 2.8 |
| Thailand | 3.5 | 3.3 | 3.7 | 3.5 | 3.5 | 3.5 | 3.6 | Mauritius | 2.5 | 2.4 | 2.5 | 1.9 | 2.5 | 3.1 | 2.9 |
| India | 3.4 | 3.0 | 3.2 | 3.5 | 3.5 | 3.6 | 3.4 | Moldova | 2.5 | 1.9 | 1.9 | 2.7 | 2.8 | 3.0 | 2.8 |
| Lithuania | 3.4 | 3.2 | 3.5 | 3.4 | 3.6 | 3.6 | 3.1 | Mongolia | 2.5 | 2.5 | 2.3 | 2.5 | 2.3 | 2.7 | 2.4 |
| Portugal | 3.4 | 3.2 | 3.6 | 3.1 | 3.6 | 3.6 | 3.2 | Nicaragua | 2.5 | 2.0 | 1.9 | 2.8 | 2.8 | 2.9 | 2.4 |
| Saudi Arabia | 3.4 | 3.0 | 3.6 | 3.3 | 3.3 | 3.6 | 3.5 | Tajikistan | 2.5 | 2.2 | 2.5 | 2.5 | 2.8 | 2.9 | 2.0 |
| Türkiye | 3.4 | 3.0 | 3.4 | 3.4 | 3.5 | 3.6 | 3.5 | Togo | 2.5 | 2.3 | 2.3 | 3.0 | 2.4 | 2.8 | 2.3 |
| Croatia | 3.3 | 3.0 | 3.0 | 3.6 | 3.4 | 3.2 | 3.4 | Trinidad and Tobago | 2.5 | 2.2 | 2.4 | 2.5 | 2.4 | 2.9 | 2.5 |
| Czechia | 3.3 | 3.0 | 3.0 | 3.4 | 3.6 | 3.7 | 3.2 | Zimbabwe | 2.5 | 2.2 | 2.4 | 2.5 | 2.3 | 2.8 | 2.7 |
| Malta | 3.3 | 3.4 | 3.7 | 3.0 | 3.4 | 3.2 | 3.4 | Bolivia | 2.4 | 2.1 | 2.4 | 2.5 | 2.4 | 2.4 | 2.5 |
| Oman | 3.3 | 3.0 | 3.2 | 3.4 | 3.2 | 3.1 | 3.9 | Cambodia | 2.4 | 2.2 | 2.1 | 2.3 | 2.4 | 2.7 | 2.8 |
| Philippines | 3.3 | 2.8 | 3.2 | 3.1 | 3.3 | 3.9 | 3.3 | Gabon | 2.4 | 2.0 | 2.2 | 2.6 | 2.0 | 3.0 | 2.5 |
| Slovak Republic | 3.3 | 3.2 | 3.3 | 3.0 | 3.4 | 3.5 | 3.3 | Guyana | 2.4 | 2.3 | 2.4 | 2.1 | 2.6 | 2.6 | 2.2 |
| Slovenia | 3.3 | 3.4 | 3.6 | 3.4 | 3.3 | 3.3 | 3.0 | Iraq | 2.4 | 2.1 | 2.2 | 2.5 | 2.2 | 3.0 | 2.4 |
| Vietnam | 3.3 | 3.1 | 3.2 | 3.3 | 3.2 | 3.3 | 3.4 | Lao PDR | 2.4 | 2.3 | 2.3 | 2.3 | 2.4 | 2.8 | 2.4 |
| Brazil | 3.2 | 2.9 | 3.2 | 2.9 | 3.3 | 3.5 | 3.2 | Liberia | 2.4 | 2.1 | 2.4 | 2.8 | 2.4 | 2.3 | 2.4 |
| Bulgaria | 3.2 | 3.1 | 3.1 | 3.0 | 3.3 | 3.5 | 3.3 | Sudan | 2.4 | 2.1 | 2.3 | 2.4 | 2.4 | 2.7 | 2.3 |
| Cyprus | 3.2 | 2.9 | 2.8 | 3.1 | 3.2 | 3.5 | 3.4 | Burkina Faso | 2.3 | 2.0 | 2.3 | 2.4 | 2.4 | 2.4 | 2.2 |
| Hungary | 3.2 | 2.7 | 3.1 | 3.4 | 3.1 | 3.6 | 3.4 | Fiji | 2.3 | 2.3 | 2.2 | 2.3 | 2.3 | 2.3 | 2.2 |
| Kuwait | 3.2 | 3.2 | 3.6 | 3.2 | 2.9 | 2.8 | 3.3 | Gambia, The | 2.3 | 1.8 | 2.3 | 2.6 | 2.3 | 2.6 | 2.4 |
| Romania | 3.2 | 2.7 | 2.9 | 3.4 | 3.3 | 3.6 | 3.5 | Iran, Islamic Rep. | 2.3 | 2.2 | 2.4 | 2.4 | 2.1 | 2.7 | 2.4 |
| Botswana | 3.1 | 3.0 | 3.1 | 3.0 | 3.4 | 3.3 | 3.0 | Kyrgyz Republic | 2.3 | 2.2 | 2.4 | 2.4 | 2.2 | 2.4 | 2.3 |
| Egypt, Arab Rep. | 3.1 | 2.8 | 3.0 | 3.2 | 2.9 | 3.6 | 2.9 | Madagascar | 2.3 | 1.8 | 1.8 | 2.9 | 2.2 | 2.6 | 2.0 |
| North Macedonia | 3.1 | 3.1 | 3.0 | 2.8 | 3.2 | 3.5 | 3.2 | Mauritania | 2.3 | 2.1 | 2.0 | 2.2 | 2.5 | 2.8 | 2.5 |
| Panama | 3.1 | 3.0 | 3.3 | 3.1 | 3.0 | 3.4 | 2.9 | Syrian Arab Republic | 2.3 | 2.2 | 2.2 | 2.3 | 2.2 | 2.5 | 2.3 |
| Bosnia and Herzegovina | 3.0 | 2.7 | 2.6 | 3.1 | 2.9 | 3.2 | 3.2 | Venezuela, RB | 2.3 | 2.1 | 2.4 | 2.0 | 2.5 | 2.5 | 2.3 |
| Chile | 3.0 | 3.0 | 2.8 | 2.7 | 3.1 | 3.2 | 3.0 | Cuba | 2.2 | 2.0 | 2.2 | 2.1 | 2.2 | 2.6 | 2.4 |
| Indonesia | 3.0 | 2.8 | 2.9 | 3.0 | 2.9 | 3.3 | 3.0 | Yemen, Rep. | 2.2 | 1.7 | 1.9 | 1.7 | 2.6 | 2.8 | 2.3 |
| Peru | 3.0 | 2.6 | 2.5 | 3.1 | 2.7 | 3.4 | 3.4 | Angola | 2.1 | 1.7 | 2.1 | 2.4 | 2.3 | 2.1 | 2.3 |
| Uruguay | 3.0 | 2.9 | 2.7 | 2.7 | 3.1 | 3.2 | 3.3 | Cameroon | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1 | 1.8 |
| Antigua and Barbuda | 2.9 | 2.2 | 2.7 | 2.9 | 2.9 | 3.4 | 3.2 | Haiti | 2.1 | 2.1 | 1.8 | 2.3 | 2.0 | 2.5 | 2.1 |
| Benin | 2.9 | 2.7 | 2.5 | 2.9 | 3.0 | 2.7 | 3.2 | Somalia | 2.0 | 1.5 | 1.9 | 2.4 | 1.8 | 2.3 | 1.8 |
| Colombia | 2.9 | 2.5 | 2.9 | 3.0 | 3.1 | 3.2 | 3.1 | Afghanistan | 1.9 | 2.1 | 1.7 | 1.8 | 2.0 | 2.3 | 1.6 |
| Costa Rica | 2.9 | 2.8 | 2.7 | 2.8 | 2.9 | 3.2 | 2.9 | Libya | 1.9 | 1.9 | 1.7 | 2.0 | 1.9 | 2.2 | 1.8 |
| Honduras | 2.9 | 2.8 | 2.7 | 3.0 | 2.7 | 3.2 | 2.6 |  | | | | | | | |

* **The 2023 edition includes an extended dataset consisting of (i) the survey-based Logistics Performance Index (LPI), which results from the traditional LPI survey of logistics professional and (ii) new key performance indicators (KPI) measuring the actual speed of trade around the world.** The new KPI are de- rived from large global tracking datasets (Big Data) covering shipping containers, air cargo, and parcels. The new KPIs are not yet included in the construction of the main LPI indicators (country scores and ranks), which remain solely based on the LPI sur- vey. The two categories of indicators pro- vide a complementary yet consistent under- standing of logistics performance. The KPI measure time or count the performance of specific links (e.g. delays at port or air- ports), while the survey-based LPI provides country-wide assessments of six aspects of logistics performance: trade- and transport- related infrastructure, customs and bor- der management, logistics services quality, timeliness of shipments, ability to track and trace, and the availability of competitively priced international shipments.
* **Logistics services were broadly resilient for both top performers and bottom per- formers in the Logistics Performance Index (LPI), despite a more challeng- ing operating environment.** Even with the COVID-19 pandemic–induced dis- ruptions to shipping and the global supply chain crisis, the average overall score in the 2023 LPI was broadly the same as in the last survey in 2018. This resilience partly reflects the robustness of the LPI survey, which captures structural factors that were not

directly affected by the recent crisis, such as the quality of infrastructure or customs. The 10 countries with the best logistics per- formance continued to offer high-caliber logistics—rated 4.1 out of 5 on average com- pared with 4.0 in 2018. The average rating of the 10 poorest performers did not fall, despite challenging circumstances, and re- mained at 2.1 out of 5, as in 2018. But the 2023 edition included 21 fewer countries, many of them low-income, than the 2018 edition.

* **Mid-level logistics performers are show- ing progress.** More countries scored higher in the LPI compared with previous years. The average overall country score has steadily risen over the past decade, with more countries clustered at an overall score of 3 to 4.
* **Supply chain reliability is critical.** For containers, the average time across all po- tential trade routes from entering the port of export to exiting the destination port is 44 days, with a standard deviation of 10.5 days. About 60 percent of the time it takes to trade goods internationally is spent at sea. But the biggest delays occur when contain- ers are held up at the origin or destination

—at ports, airports, or multimodal facili- ties. Policies targeting these facilities, such as investing in port productivity, modern- izing customs, and new technologies, can improve reliability.

* **Performance transcends income.** This is especially apparent with new key perfor- mance indicators, such as the time contain- ers spent in ports (dwell time). Emerging

Table of contents

economies tend to have shorter delays than industrialized economies, possibly because of the lingering effects of the 2021–22 sup- ply chain crisis, the effects of Russia’s in- vasion of Ukraine on logistics in Europe, and the leapfrogging of richer economies

in port productivity and digitalization of end-to-end supply chains. Middle-income countries with consistent performance across the six LPI components could out- perform both their peers and more ad- vanced countries.

* + **Improving customs and infrastructure matters most for raising the overall score of bottom performers.** The performance of customs and border agencies, as well as the quality of trade- and transport-related infrastructure, is particularly weak in the lowest performing countries. These coun- tries, many of them in the Middle East and North Africa and in Sub-Saharan Africa, experience much longer delays than ad- vanced and emerging economies and many middle-income countries. On average, ex- port delays are of the same magnitude as im- port delays but for different reasons: export delays are tied more to the quality of service or to economies of scale.
  + **Addressing bottlenecks in landlocked developing countries is beyond the scope of unilateral interventions and requires coordinated interventions across bor- ders, such as introducing robust transit**

**regimes.** The LPI is closely associated with connectivity indicators such as the number of maritime or aerial connections. Land- locked developing countries face long delays in transit countries, and small island states depend on transshipment and suffer from less frequent connections, which increases lead time and reduces reliability.

* **Environmentally sustainable logistics options can lessen the carbon footprint of supply chains and keep trade moving.** Environmentally friendly options include shifting to less carbon-intensive freight modes, more energy-efficient warehousing, or better capacity utilization. Demand for green shipping options is highest (75 per- cent) for exports to countries in the top two performance quintiles and lower for exports to countries in the middle (over 20 percent) and bottom two (10 percent) quintiles.

This seventh edition of *Connecting to Compete* comes as disruptions of global value chains have revealed the crucial importance of logistics sys- tems. Because of these disruptions, supply chain resilience and its national security implications have emerged as top concerns. These concerns are often linked with supply chain security, including cybersecurity—a key consideration in a highly digitalized and globally connected service industry.

This report presents the latest view on trade logistics performance across 139 countries. Lo- gistics is understood as a network of services that support the physical movement of goods, trade across borders, and commerce within bor- ders. It comprises transportation, warehousing, brokerage, express delivery, terminal operations, and related data and information management. Previous editions of this report have relied exclusively on a survey of logistics professionals. This edition introduces a new set of key perfor- mance indicators, derived from a Big Data ap- proach, on actual movements of maritime ship- ping containers, air freight, and postal parcels by trade lane and gateway. These indicators com- plement the traditional survey-based Logistics Performance Index (LPI), on which LPI scores and ranks are still based. The survey asks a given country’s partners to assess how easy or difficult it is to trade in manufactured products trans- ported in unit forms such as shipping contain- ers. The six components of the LPI, unchanged since its launch in 2007, are assessed at the

country level on a 5-point scale.1

The 2023 LPI survey was conducted from September 6 to November 5, 2022. It contains 4,090 country assessments by 652 logistics pro- fessionals in 115 countries in all World Bank regions.[1]2 Unlike previous editions, the 2023 survey did not contain questions on logistics

quality in the country from which these pro- fessionals operate—that is, an assessment of domestic performance—in order to keep the survey concise and easier to answer. The team also faced difficulties in conducting the survey in 2020/21 due to the COVID-19 pandemic, eventually postponing the survey to 2022.

**The LPI measures structural factors of performance, beyond disruptions**

The recent supply chain crisis did not substan- tially change the relative pattern of LPI scores in 2023, except for a slight deterioration of the timeliness component. There are several possible reasons behind this outcome:

* The global scope of the disruptions means

that when everyone is affected, it is difficult to assign the impact to individual countries.

* The LPI survey was conducted in late 2022,

when disruptions had already greatly dimin- ished, possibly creating recency bias among respondents.

* Most LPI components reflect structural fac-

tors that are not directly affected by the re- cent crisis, such as the quality of infrastruc- ture.

* Shippers and logistics service providers have

generally been able to absorb the disruptions well, as indicated by the rebound in GDP growth in most countries.3

**Logistics performance remained stable or improved, but a gap persisted between the top and bottom performers**

Overall, the score profile of countries covered in the LPI has remained stable, despite the more challenging operational environment

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2007** | **2010** | **2012** | **2014** | **2016** | **2018** | **2023a** |
| Top 10 average | 4.1 | 4.0 | 4.0 | 4.0 | 4.1 | 4.0 | 4.1b |
| Bottom 10 average | 1.8 | 2.1 | 2.0 | 2.1 | 1.9 | 2.1 | 2.1 |

since 2018. This reflects logistics service pro- viders’ ability to adapt to dramatically chang- ing circumstances—but it could also indicate the robustness of underlying data across LPI editions (table 1). Average scores among low- performing countries have increased over time. In the 2023 LPI, the top 12 scorers are high- income economies. Singapore, with a score of 4.3, is at the top, a position it also held in 2007 and 2012. Of the top 12 scorers, 8 are in Europe (Fin- land, scoring 4.2; Denmark, the Netherlands, and Switzerland, scoring 4.1; and Austria, Belgium, Germany, and Sweden, scoring 4.0). They are joined by Hong Kong SAR, China; the United Arab Emirates; and Canada. Most of these econo- mies have for years been dominant players across

**Top 10 and bottom 10 average LPI scores, 2007–23 (1, low, to 5, high)**

*Source:* 2007, 2010, 2012, 2014, 2016, 2018, and 2023 Logistics Performance Index.

1. Data are for 2022.
2. Average is for the top 12 scores due to rounding scores to one decimal point in 2023 rather than two as in previous editions.

Table **1**

international supply chain networks.

The bottom 10 scorers are mostly low- and lower-middle-income countries and are located

on several continents. They are either fragile economies affected by armed conflict, natural disasters, or political unrest or landlocked coun- tries challenged by geography or economies of scale in connecting to global supply chains. Af- ghanistan and Libya have the lowest score (1.9), followed by Somalia (2.0), Angola, Cameroon, and Haiti (2.1).

The most frequent LPI score has increased over the past decade, implying that logistics performance overall has improved (figure 1). Between 2018 and 2023, a secondary, smaller peak emerged around a score of 3.5, meaning that more countries have relatively strong per- formance. In addition, the lowest scores have tended to increase, particularly in the 2023 LPI, but this is due partly to a sample of 139 coun- tries compared with 160 in 2018. The 2018 sam- ple included 20 countries with a score of 2.6 or

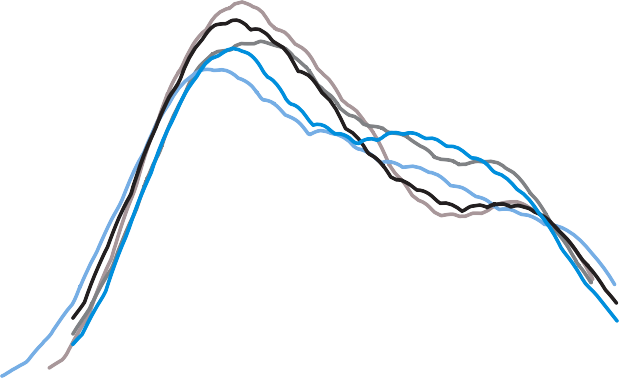


Figure **1 Distribution of LPI scores, 2012–23**

Probability density 0.8

2012 2014 2016 2018 2023

0.6

0.4

0.2

0.0

1

2

3

LPI score

4

5

*Source:* 2012, 2014, 2016, 2018, and 2023 Logistics Performance Index.

*Note:* To avoid composition effects, only countries with scores in all years are included in the analysis.

below (and an average score of 2.4) that were not included in the 2023 sample. This makes com- paring the bottom tail difficult between the two years.

Despite this, a considerable gap in per- formance persists between the top and bot- tom scorers. Although the average score of low performers has increased, some countries have stayed at their previous levels. These are typically the poor logistics performers—those with severe logistics constraints (43 countries in the bottom performance quintile).4 Partial performers have logistics constraints typically seen in low- and middle-income countries (46 countries in the middle quintile and the second quintile from the bottom). Countries in the top two performance groups typically received slightly higher scores in the 2023 LPI than in 2018 and earlier. They include consistent per- formers, countries rated better on logistics per- formance than most others in their income group (25 countries in the second quintile from the top)—and logistics-friendly countries, the top scorers, most of which are high income (25 countries in the top quintile).

**Strong overall logistics performance is driven by good performance across all six LPI components**

Several trends observed in past LPI reports still hold. The timeliness component outper- forms the other components in all perfor- mance quintiles, except the top one, whereas the performance of customs and border agen- cies underperforms the other components. The quality of trade and transport infrastructure remains below the overall LPI score in the bot- tom three quintiles. But there is a clear dete- rioration in timeliness scores in absolute terms in all quintiles due to the effects of the supply chain crisis, which were felt most acutely in shipment delays. While absolute scores fell, the relative pattern of performance persisted.

The quality of logistics services is on par with overall performance, but the tracking and tracing component is as good as or better than overall performance in almost all performance quintiles. Taken as a whole, the LPI suggests

that overall performance reflects the ability to perform well across all components—possibly indicating complementarity among them, as all stages of the value chain matter. Poor per- formance in one component drags down overall performance.

For countries with low LPI scores, infra- structure matters most to improving perfor- mance. But the key to sustained high logistics performance lies in a broader set of interven- tions covering policy and private sector devel- opment. One important objective should be to better predict when goods will arrive at their destination, as with supply chain visibility tools that facilitate traceability.

**Measuring the speed of trade: New key performance indicators**

This edition of *Connecting to Compete* incorpo- rates new key performance indicators, derived from a Big Data approach, measuring the speed of trade around the world. These indicators are based on millions of actual international move- ments of containers, aviation shipments, and postal parcels. Global tracking initiatives— including Cargo iQ (supported by the Interna- tional Air Transport Association), TradeLens, and the Universal Postal Union—made the raw data available to the World Bank.

The key performance indicators comple- ment the assessment of logistics performance provided by the survey-based LPI with more specific measurements: Delays at ports and air- ports and international connectivity (for exam- ple, the number of international connections by country and by mode). The new indicators, mea- sured in days or simple counts, are relatable to policymakers and practitioners concerned with the performance of key logistics hubs and gate- ways, such as ports or airports.

**A more complex picture of trade bottlenecks**

Understanding performance requires look- ing beyond average shipment times. Lead time (delay) of connections in international supply chains is widely dispersed and skewed to the

right of the mean, meaning there are many out- liers with high dwell times.5 The long tail of the distribution makes lengthy delays likely for the slowest shipments (see figure 2 for an example using the port of Algiers in Algeria). It means that they lack of reliability across the supply chain is more important than the average delay at links of the supply chain, especially if trace- ability along the supply chain and information flows are lost. Being unable to locate or pre- dict the movement of containers—because, for example, they are stalled on ships or arbitrarily held up in customs—matters a lot to consignees.

Trade experiences much more dispersion in delays when not moving at ports, airports, or multimodal facilities than when moving on ships. Most time (two-thirds, on average) is spent in transit. Policies targeting these facili- ties, such as investing in port productivity or modernizing customs, can improve reliability. New technologies, such as supply chain visibil- ity platforms, are even more promising.

Average delays at ports, at airports, or in postal delivery tend to be negatively correlated with a country’s overall LPI score. Long delays are a sign of performance problems, but short delays do not necessarily indicate high overall logistics performance. Take import dwell time, or the mean time containers stay at ports before being removed for delivery: Most countries have

dwell times of three to nine days. Few countries have a dwell time of more than 12 days. De- lays can be caused by such factors as low port handling productivity, city congestion, slow preparation of trade documents to comply with exchange controls, or abuse of port storage by importers. Most outliers are in the Middle East and in North, Central, and West Africa. Similar patterns apply to aviation logistics, with shorter delays (typically one-third as long) and substan- tial overlaps of outliers.

Dwell time is not clearly associated with in- come (map 1). Countries in Europe and North America do worse on this metric than other high-income and emerging economies. Singa- pore, for example, has a dwell time of around three days compared with more than seven for the United States. The recent turmoil in global logistics is a first explanation (the data on con- tainer movements are for May–October 2022). Countries in Northern Europe have been weathering the ripple impact of sanctions on Russian shipping. Emerging economies may also benefit from more recent investments in soft and hard port infrastructure. As for aviation lo- gistics, airport dwell time is shorter than mari- time dwell time, typically by a factor of three. Airport dwell time follows the same patterns as maritime dwell time, with substantial overlaps of outliers for both modes.

Figure **2 Dispersion of time spent at port: Long tail distribution of containers in the port of Algiers, Algeria, May–October 2022**

Number of consignments

200

Median Mean

150

100

50

0 0

20

40

60

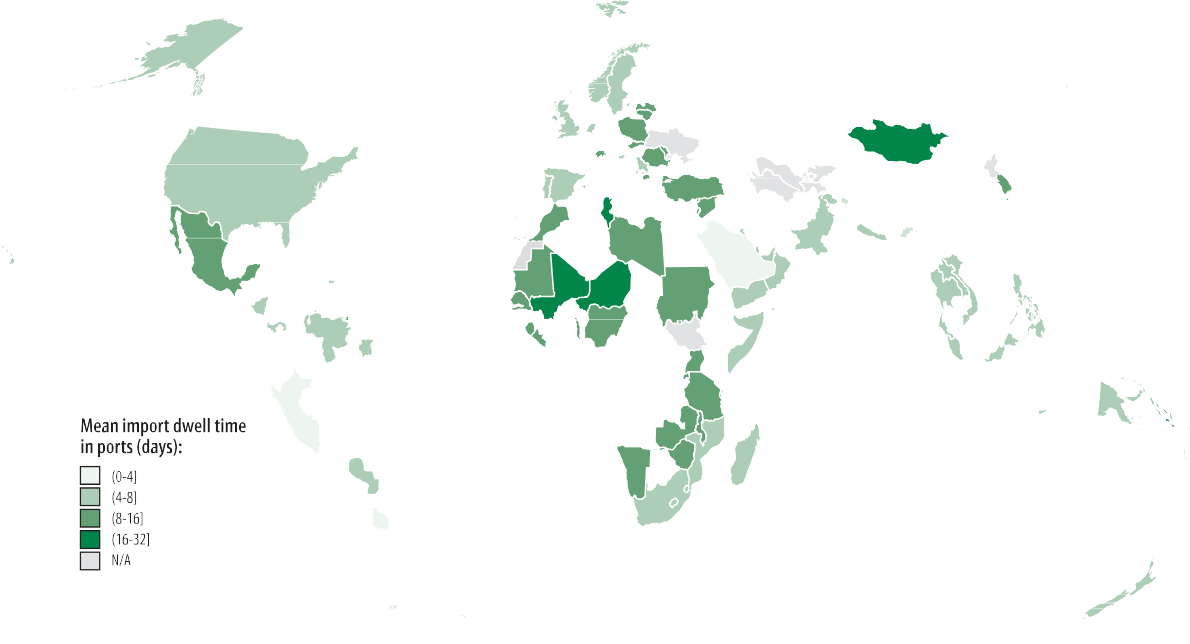
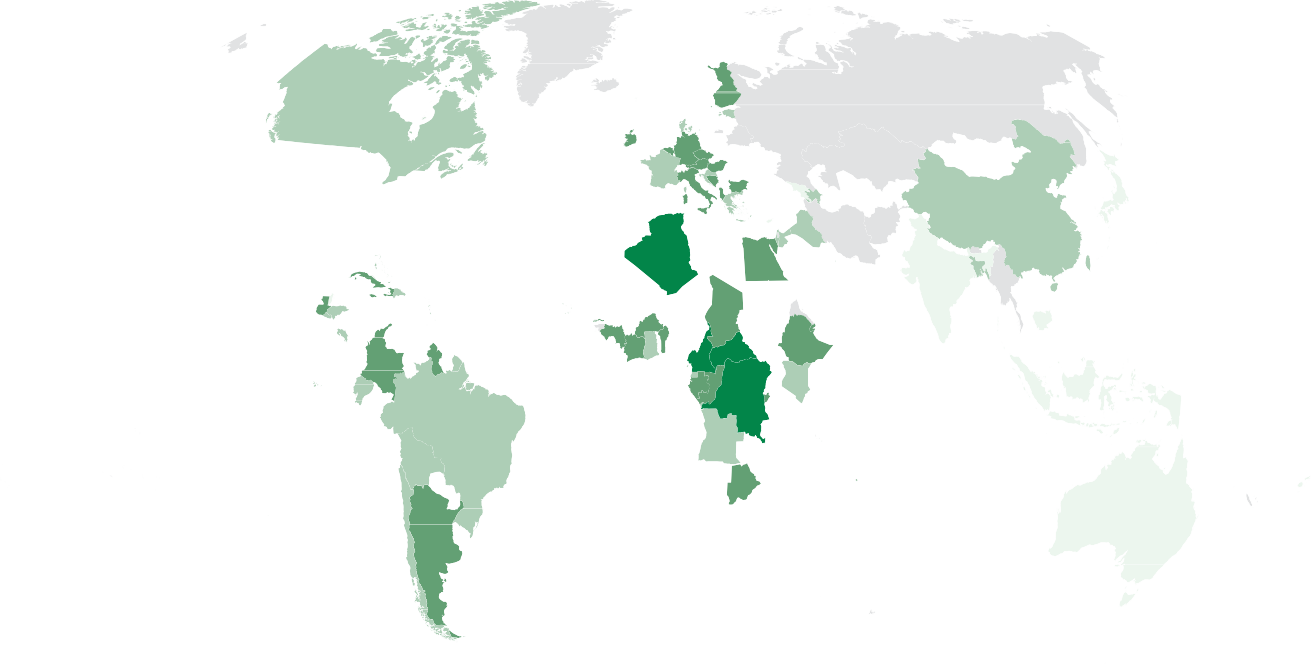
80

100

Import dwell time (days)

*Source:* World Bank estimates based on TradeLens data.

*Note:* Consignments with an import dwell time of more than 100 days are excluded.



Map **1**

**Mean import dwell time of containers around the world, May–October 2022**

*Source:* TradeLens and World Bank.

**Landlocked developing countries and the importance of connectivity**

Landlocked developing countries are logistically constrained. They may have short delays at desti- nations (for imports) but longer delays on tran- sit corridors and at the port of entry. On aver- age, the dwell time at the same port of entry is substantially longer for landlocked developing countries than for their coastal transit coun- tries. Addressing these bottlenecks is beyond the scope of unilateral interventions and requires coordinated interventions across borders, such as robust transit regimes similar to the ones imple- mented in Europe (Transports Internationaux Routiers and the European transit system).

Connectivity, measured as the number of transport connections, is associated with lo- gistics performance, irrespective of transport mode.6 Having more connectivity options is positively associated with logistics performance through, for example, increasing competition for logistics services, higher hard and soft trade infrastructure investments (such as ports and information technology systems), the growing

presence of global logistics operators, and expo- sure to best practices.

Transport connectivity is driven largely by economies of scale and the geography of global networks. Conversely, countries with few mari- time connections, such as small maritime econo- mies, trade through a chain of container trans- shipment ports. Transshipment hubs have a similar dispersion in port dwell time as destina- tion ports. Small maritime economies experience not only longer lead time to trade but also less re- liable connections, contributing to lower logis- tics performance. This is due to dependence on only a few transshipment hubs, which are able to charge markups; the higher cost of going through a transshipment hub than exporting from a full- fledged port; and—chiefly—the extra delays and lower reliability induced by transshipment.

**Mounting regulatory and demand pressure toward environmental sustainability**

As in 2018, the LPI survey links environmen- tal sustainability and logistics performance by

asking how often shippers have asked for environ- mentally friendly options when sending goods to the surveyed countries.7 The wording in this question is general because of the numerous ship- ping options and ways to measure their environ- mental impact. Environmentally friendly options in logistics range from shorter routes, source of propulsion, or better capacity utilization to mini- mize transport emissions. Therefore, the findings are indicative of the prevalence of such needs among shippers, as encountered by freight for- warding and logistics professionals.

Almost 75 percent of shippers had asked for such options “often” or “nearly always” when ex- porting to countries in the top two performance quintiles.8 The share was slightly over 20 percent when exporting to countries in the middle per- formance quintile and well below 10 percent to countries to the two lowest performance

quintiles. Despite the variation, demand forces are an important factor pushing logistics opera- tions in a more sustainable direction (also see map A6.1 in appendix 6).

This trend is in line with the increasing number of global and national commitments to reduce logistics-related greenhouse gas emis- sions and other harmful emissions, for which targets are becoming ever more challenging in all transport modes. This regulatory pressure is mounting in air, road, and maritime transport. It drives the change to more environmentally friendly logistics processes and equipment, espe- cially when they can generate economic savings. The pressure from demand forces is gaining mo- mentum, particularly in high-income countries. For policymakers this means that the search for implementable “green logistics” policies is be- coming more important.

# Key changes in global supply chains since 2018 and implications for the 2023 Logistics Performance Index

**CHAPTER**

**1**

This seventh edition of *Connecting to Compete* complements the Logistics Performance Index (LPI) survey results with information derived from a Big Data approach using technological advances in tracking shipments across different modes of transport. A deeper understanding of logistics processes at the micro level is impor- tant in light of changing realities on the ground. Since its launch in 2007, the LPI has provided a simple assessment by professional sources of how easy it is to export to a target country in terms of the quality of infrastructure, the qual- ity and availability of logistics activities, and public sector bottlenecks. The LPI and its com- ponents are best interpreted as a snapshot of where a country stands on logistics with respect to its peers or comparators. As such, it can serve as an entry point to a more comprehensive mea- surement of a country’s logistics performance.

**Understanding logistics performance and its determinants is now more important than ever**

Measuring logistics performance and under- standing its determinants are now more impor- tant than ever against a background of major changes in global markets since 2018 due to the COVID-19 pandemic, subsequent shipping and air freight disruptions (the latter from restric- tions imposed on passenger air transport), and Russia’s invasion of Ukraine (see also box 1.1 on vaccine logistics). During the COVID-19 pan- demic, demand for some types of goods, such as electronics and home appliances, rose, while production and transport capacity fell. For example, the demand for microchips, a crucial component in electronics and most manufac- turing industries, surged, but their supply was hampered by droughts and accidents in sev- eral major production sites—in addition to the

effects of the pandemic. In many countries, the pandemic also affected the availability of truck drivers, train engineers, and port and warehouse workers, and it complicated crew changes on seagoing vessels. Some countries also applied strict zero-COVID policies, with extensive local lockdowns.

Energy and food prices increased because of discontinued exports from Belarus, Russia, and Ukraine in the wake of Russia’s invasion of Ukraine. This generated cascading effects such as exports bans and overshooting demand. Con- tainer shipping was affected when most services to and from Russia were discontinued. Russia’s and Belarus’s trade and transport connections with Europe were largely cut off, including flights over Russian airspace and container rail services between Europe and Asia through Russia.

**Container shipping disruptions in 2020–22**

Container ships carry over half of world trade by value and, until early 2020, offered high reliabil- ity at low freight rates. Since then, freight rates have soared to unprecedented levels, and capac- ity constraints in seaports, vessels, and container availability have become endemic. As a result, service reliability plummeted to an all-time low toward the end of 2021 (figure 1.1). In summer 2022, about 12 percent of the world’s container carrying capacity was onboard vessels outside seaports waiting to be unloaded.9 Many of these bottlenecks could be traced to port lockdowns in East Asia or productivity constraints on the US West Coast, but with global impacts on shipping capacity and cascading effects along the supply chains. Toward the end of 2022, these problems eased considerably, and container freight rates are returning to pre–COVID-19 pandemic lev- els as demand drops.

**Vaccine logistics**

Box **1.1**

Vaccines are vital public health products, even more so during the global COVID-19 pandemic. But many vaccines have special handling re- quirements that require substantial logistics ca- pacity in sending and receiving countries. For instance, some COVID-19 vaccines have cold chain supply requirements—high-level logistics competence that many countries lack.

Logistics bottlenecks can contribute to slow movement of vaccines to and within countries. Better logistics performance is associated with higher vaccination rates, even after per capita in- come and government spending on health are con- trolled for.1 A review of a range of studies on logis- tics requirements concluded that an efficient and resilient supply chain—which depends on strong logistics—was vital to ensuring that the COVID-19 vaccines reached their target populations.2 Effi- cient cold chain management depends on regula- tory requirements, logistics performance, and the chemical stability of the goods being moved.

Figure **1.1 Container shipping schedule reliability, average delay for late arrivals, and spot rates, June 2018–22**

Container shipping spot rate, 40-foot equivalent unit on seven main trades (US$)

12,000

Schedule reliability (right axis)

Schedule reliability (%)

Average delay for late arrivals (days)

10 100

10,000

8,000

Average delay for late arrivals (right axis)

6,000

4,000

2,000

Container shipping spot rate (left axis)

0

2018

2019

2020

2021

2022

2023

*Source:* Data on schedule reliability and delays, Sea-Intelligence; data on spot rates, Drewry World Container Composite Index.

The capacity of logistics service providers is a key determinant of cold chain supply per- formance for vaccines.3 Targeted investment along with strategic planning can mitigate the challenges posed by cold chain supply require- ments for vaccines.4

The COVID-19 pandemic has resulted in huge losses, including in lives and livelihoods, around the world. Ensuring that vaccines are widely distributed on an ongoing basis is impor- tant not only from an equity point of view but also as part of support to the global economy. Given the special requirements of vaccines, logistics service providers can play an important role in realizing this vision.

**Notes**

1. Helble and Shepherd 2017.
2. Fahrni and others 2022.
3. Pambudi and others 2021.
4. Fleming, Okebukola, and Skiba 2021.

|  |  |
| --- | --- |
| 9 | 90 |
| 8 | 80 |
| 7 | 70 |
| 6 | 60 |
| 5 | 50 |
| 4 | 40 |
| 3 | 30 |
| 2 | 20 |
| 1 | 10 |
| 0 | 0 |

Chapter 1 Key changes in global supply chains since 2018 and implications for the 2023 LPI

**Air freight market disruptions in 2020–22**

Approximately US$6 trillion worth of goods—35 percent of world trade by value—is transported each year as air freight.10 The over- all demand for international air freight has been stable since 2018. Variation in the supply by widebody passenger aircraft, which is offset only partly by changes in the capacity offered by dedicated air freighters, seems to drive air freight pricing. Before the COVID-19 pandemic, about half of air freight was carried in scheduled pas- senger aircraft. Ad hoc fluctuations in rates can happen due to a sudden local change in demand. Attracted by higher rates, nonscheduled freighter capacity usually takes several weeks to adjust supply and push prices to a new equilib- rium (figure 1.2). Since January 2022, air freight prices have declined due to increased passenger widebody aircraft capacity on many routes. This happened first on transatlantic routes and later on most Europe–Asia routes.

**The rapid emergence of**

**e-commerce as an important channel for cross-border trade**

The volume of e-commerce has surged in the past decade. By 2030, cross-border e-commerce

in goods is expected to grow to US$1– US$2 trillion in merchandise value from its current US$300 billion, resulting in substan- tial changes in supply chains.11 E-commerce was equivalent to 30 percent of global GDP in 2019,12 so its role and importance in economic development cannot be overlooked. Most cross- border e-commerce depends on postal-parcel services provided by members of the Universal Postal Union (a specialized UN agency) or the networks of global express operators (for exam- ple, DHL, FedEx, and UPS).

Universal Postal Union members handle two-thirds of cross-border deliveries of letter- parcel items (up to 2 kilograms). Therefore, in- formation collected by the union is a source of comprehensive data for more than 190 member countries. It is probably the best unified source of information on e-commerce trade.13

**The 2023 LPI measures structural factors of performance rather than supply chain disruptions**

The recent supply chain crisis did not substan- tially change the relative pattern or even absolute scores in the 2023 LPI across countries compared with previous editions, except for a slight deterio- ration of the timeliness component since 2018. This may seem odd, given the severity of the

Figure **1.2 Global air freight supply, demand, and prices, January 2018–July 2022**

Demand or supply (billions of cargo ton-km) Price per kg (US$)

50 5

40

4

30

3

20

2

10

1

0

0

Jan. Apr. July Oct. Jan. Apr. July Oct. Jan. Apr. July Oct. Jan. Apr. July Oct. Jan. Apr. July 2018 2019 2020 2021 2022

*Source:* Dewulf and Van Broekstaele (2022) based on data from the Freightos Air Index, Cargo iQ (supported by the International Air Transport Association), and WorldACD.

After COVID-19

During COVID-19

Before COVID-19

Demand (left axis)

Price (right axis)

Supply (left axis)

impacts on container shipping freight and service levels, changes in air freight markets, various restrictions during the COVID-19 pandemic, and discontinued trade relations and cargo lanes. One possible explanation is the global scope of the supply chain crisis. With practically every- body affected by disruptions beyond their control almost simultaneously, it is difficult to assign the impact on individual countries.

In addition, the survey data were collected when supply chain disruptions had already greatly diminished. For example, the Global Supply Chain Pressure Index, a composite mea- sure of global supply chain disruptions, peaked at 4.3 standard deviations above its historical mean at the end of 2021, declined to 2.8 in March 2022, temporarily increased in April 2022 due primarily to COVID-19 pandemic lockdowns in China and Russia’s invasion of Ukraine, then declined for five months to al- most normal levels (0.9) in September 2022, when the LPI survey went live. This may have contributed to recency bias among respondents.

Further, four of the six LPI components reflect deep structural factors that are not di- rectly affected by the recent supply chain crisis (ease of working with customs and other bor- der agencies, infrastructure, logistics services quality, and the ability to track and trace ship- ments). Performance on these metrics may have improved due to policy reforms and private sector capacity building over time, despite the constraints imposed by recent conditions. These factors also improve resilience against shocks.

New indicators based on tracking data, such as the time containers stay in ports or airports, look at the speed of trade. By nature they are more affected by major disruptions such as the recent ones than the survey-based LPI. With the exception of the postal data (which is for 2019), the data cover the same period as the LPI survey, mid-2022. The results are likely to be affected by the tail of the supply chain crisis or Russia’s invasion of Ukraine (see map 1 in the executive summary). Unfortunately, precrisis data are not available for comparison.

**The 2023 LPI survey question on supply chain disruptions**

Box **1.2**

This year’s survey included a question on dis- ruptions in logistics operations since 2019. The effects were far from equal across countries. Among respondents dealing with exports to high-income countries, 13 percent reported that operations had suffered major disruptions or had been discontinued. The same was true for 59 percent of those exporting to middle- income countries and for 75 percent of respon- dents exporting to low-income countries. When examined bilaterally by destination, shipments

to high-income countries appeared to be the least disrupted, and shipments to low-income countries the most (see also map A6.2 in ap- pendix 6).

In summary, respondents in low-scoring en- vironments appear to perceive conditions abroad as much better, whereas those in high-scoring environments perceive them as much worse. The order and direction of ratings are consistent when analyzed by income group (see table 2.1 in chapter 2).

# 2 The 2023 Logistics Performance Index

**CHAPTER**

This chapter focuses on reporting and inter- preting findings from the 2023 Logistics Per- formance Index (LPI) survey, taking account of new realities in the logistics marketplace, policy environment, and international setting. The methodology of this part of the report is largely unchanged from previous editions. The scores and ranks of the 2023 LPI presented before the executive summary and in appendix 1 rely exclusively on the LPI survey. Box 2.1 summa- rizes the survey-based LPI’s key features.

**How to interpret the LPI**

This edition differs from previous editions of *Connecting to Compete* in how it presents data. Previous reports presented LPI scores and ranks, along with confidence intervals for both (box 2.2). Scores and confidence intervals were rounded to two decimal places, and rankings were based on those rounded figures. While raw results of this kind are useful for some purposes, they risk overinterpretation. LPI scores reflect a survey-based quantification of qualitative percep- tions and are thus subject to concerns about noise. Similarly, sampling is nonrandom since re- spondents choose whether to participate. Issues such as these create difficulties when compar- ing small changes between countries. An addi- tional issue relates to year-on-year comparisons, which suffer from the limitation that respon- dents grade performance on a qualitative scale

that could suffer from indexing issues.

The approach this year differs. First, scores and confidence intervals are rounded to a single decimal place. The rationale for this change is that the survey uses whole numbers on a Likert scale for country ratings, so countries with sim- ilar but not identical response patterns receive identical scores.

Second, the presentation of results focuses more on groups of countries with broadly simi- lar performance than on small differences in scores between countries. Where it is impor- tant from a policy perspective to highlight dif- ferences across countries, the analysis focuses on those differences at the country group level rather than at the individual country level.

This approach still allows for summarizing broad trends across geographic areas and income groups, which the following sections do. But it reduces the likelihood of users overinterpreting scores and rankings. The intention is to shift the focus to policy-relevant differences across coun- tries from survey-based scores and rankings that can vary due in part to sampling and measure- ment error and perhaps exceptional situations such as the COVID-19 pandemic.

As before, the main caveat is that this part of the LPI is based on a survey. So, country-level outcomes can be affected by low numbers of respondents, which is the case for some small and low-income countries. Efforts to collect the maximum amount of information on these countries do not always pay off. This dynamic is an additional reason for presenting results by country group rather than individually. As a perception-based indicator, the LPI might ex- hibit differences from county-level indicators. Likewise, the LPI does not measure reforms.

**Features of the 2023 survey**

The 2023 LPI survey employed broadly the same methodology as the previous six editions*,* though with a simplified approach for the ques- tionnaire. Until 2018, the questionnaire had two parts: international and domestic. In the international questionnaire, respondents evalu- ated six indicators of logistics performance in up

**The six components of the LPI**



Box **2.1**

The World Bank’s Logistics Performance Index (LPI) analyzes coun- tries through six components:

1. The efficiency of customs and border management clearance.
2. The quality of trade- and transport-related infrastructure.
3. The ease of arranging competitively priced international shipments.
4. The competence and quality of logistics services.

target markets. While the pool of participants is not constant over time (due to staffing and organizational changes in the industry), participating logistics professionals is central to the quality and credibility of the LPI, and their involvement and feedback have been essential in developing and refining the survey over time.

**Input and outcome LPI indicators**

1. The ability to track and trace consignments.
2. The frequency with which shipments reach consignees within the scheduled or expected delivery time.

The indicators were chosen based on theoretical and empiri- cal research and the practical experience of logistics professionals involved in international freight forwarding. The figure maps the six LPI indicators to two main categories:

* + Areas for policy regulation, indicating main inputs to the sup- ply chain: customs, infrastructure, and services (indicators 1, 2, and 4 above).

Customs

Infra- structure

Services quality

**Areas for policy**

**Supply chain service delivery**

Timeliness

Inter- national shipments

Tracking and tracing

**Service delivery performance**

* + Supply chain performance outcomes: cost, reliability, and

time (indicators 3, 5, and 6 above).

The LPI uses standard statistical techniques to aggregate the data into a single indicator, converting qualitative information into

**regulations (inputs)**

**outcomes**

Time, cost, reliability

quantitative information, before aggregating and weighting (see ap- pendix 5 for details of the methodology).1 It relies on an online survey of logistics professionals from multinational freight forwarders and the main express carriers. Their views matter because they directly affect the choice of shipping routes and gateways, thereby influenc- ing firms’ decisions on production location, choice of suppliers, and

See the 2023 LPI questionnaire at [https://lpi.worldbank.org](https://lpi.worldbank.org/).

**Note**

1. In all editions of the LPI, statistical aggregation has yielded an overall score that is close to the simple average of country scores across the six components.

to eight partner countries. In the domestic ques- tionnaire, respondents provided qualitative and quantitative data for the logistics environment in the country where they work.

The 2023 LPI survey used only the interna- tional part of the survey, so comparisons over time reflect solely that part. The domestic part was cut for two reasons. First, to counter sur- vey fatigue among respondents. Second, because most of the data covered by the domestic part of the survey can be gleaned more easily and accurately from the new supply chain tracking datasets in chapter 3.14 The 2023 survey, con- ducted from September 6 to November 5, 2022, included 4,090 assessments of 139 countries by logistics professionals.

**Key findings of the 2023 LPI survey**

Over the past decade, high-income countries have occupied the top positions in the LPI rankings (see table A3.1 in appendix 3). Geo- graphically, top scorers are concentrated in Europe, but East Asia and Pacific, North Amer- ica, and the Middle East and North Africa are also represented. There are 12 economies atop the logistics performance leaderboard in 2023, all with a score of 4 or higher, compared with 11 in 2018. These economies have tradition- ally dominated international supply chain net- works, and the composition of the group has been steady over time. The recent supply chain crisis has not significantly changed this relative

**How precise are LPI scores?**

Box **2.2**

Although the Logistics Performance Index (LPI) and its components offer the most comprehen- sive and comparable data on country logistics and trade facilitation environments, they have a narrow domain of validity because of the limited experience of survey respondents with respect to the countries they assess and because of the high dependence of the logistics of landlocked countries and small island states on the logistics of other countries.

To account for the sampling error created by the survey-based dataset, LPI scores are presented with approximately 80 percent con- fidence intervals, which yield upper and lower

bounds for a country’s score (see appendix 5). Confidence intervals must be examined to determine whether a difference between two scores is statistically significant. An improve- ment in a country’s performance is considered statistically significant only if the lower bound of its 2023 score exceeds the upper bound of its 2018 score. Because of the LPI’s narrow domain of validity and the need for confidence inter- vals to account for sampling error, a country’s exact score might be less relevant to policy- makers than its proximity to others in a wider performance group or its statistically significant improvement.

pattern of results across countries because the crisis is global in scope.

By contrast, the bottom 10 scorers15 are mostly low-income and lower-middle-income countries, all with an LPI score of 2.2 or lower (see table A3.2 in appendix 3). That only 10 countries meet this criterion is a major change from 2018, when 22 countries did. It partly re- flects a smaller survey sample (139 countries ver- sus 160 countries), but it could also be linked to improvements in performance—a point revis- ited below. Given that four of the six LPI com- ponents reflect deep structural factors that are not directly affected by the supply chain crisis, it is plausible that performance on these metrics has improved due to policy reforms and private sector capacity building over time, despite the constraints imposed by recent conditions. For the most part, the countries in this group are fragile economies affected by armed conflict, natural disasters, or political unrest or face chal- lenges of geography, such as being landlocked, or diseconomies of scale in connecting to global supply chains, where countries are too small to be connected widely. There is more movement in and out of the bottom group than in and out of the top group.

Identifying logistics performance groups LPI scores are broken down into four perfor- mance groups, based on score quintiles:16

* *Poor logistics performers.* Countries with se- vere logistics constraints, such as the least developed countries (43 countries in the bottom quintile).
* *Partial performers.* Countries with a level of

logistics constraints most often seen in low- and middle-income countries (46 coun- tries in the middle quintile and the second quintile from the bottom).

* *Consistent performers.* Countries rated bet-

ter on logistics performance than most oth- ers in their income group (25 countries in the second quintile from the top).

* *Logistics-friendly.* Top-performing coun-

tries, most of which are in the high-income group (25 countries in the top quintile).

## The groups track relative performance for the set of countries captured in a single year of the LPI. As a result, average scores across groups as well as measures of disper- sion within and across groups can be relevant to understanding how countries compare in a single year. Country scores are bunched at the low and middle ranges (corresponding to the bottom three quintiles)—a key reason for the change in reporting practice with this edi- tion (figure 2.1). When countries are grouped closely, it is more informative for policymakers to focus on broadly defined country groups than on individual country scores and ranks.

Figure **2.1 Histogram of scores of the 139 countries and four performance groups in the 2023 LPI**

Percent

20

Poor logistics Logistics-

performers performers friendly

15

10

5

0 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0

Overall LPI score

*Source:* 2023 Logistics Performance Index.

*Note:* Vertical lines correspond to score cutoffs for the four performance groups identified in the main text. Four groups are displayed because the partial performers group includes two quintiles (the middle and the second from the bottom).

Consistent performers

Partial

Bilateral LPI assessments between income groups

Given that the LPI assesses logistics perfor-

mance by eliciting ratings from profession- als outside the country being scored, break- ing results out bilaterally (that is, between the respondent’s country and the assessed country) provides additional insight.

Respondents from all income groups rated the high-income group the highest, followed by the upper-middle-income and lower middle-income groups, then the low- income group (table 2.1). Hence, ratings are consistent in a rank order sense across in- come groups. However, income groups dif- fer noticeably in the average scores they gave other groups: the low-income group gave the

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Assessed country** | | | | | |
| **Respondent’s country** | **High income** | **Upper middle income** | **Lower middle income** | **Low income** | **Average** |
| High income | 3.7 | 2.7 | 2.4 | 2.0 | 2.7 |
| Upper middle income | 3.7 | 3.0 | 2.6 | 2.5 | 3.0 |
| Lower middle income | 3.8 | 3.2 | 3.1 | 2.3 | 3.1 |
| Low income | 4.3 | 4.2 | 3.4 | 2.9 | 3.7 |

highest average score (3.7), followed by the lower-middle-income group (3.1), the upper- middle-income group (3.0), and the high- income group (2.7). So, respondents’ context affects how they score performance abroad.17 These findings are consistent with a model of perception formation in which respondents compare performance abroad to performance in their home country. This dynamic is an ad- ditional reason for preferring analysis of LPI scores using broad country groups rather than high-precision scores and limits the extent to which differences in score can lead to concrete policy interpretations.

Strong overall logistics performance is driven by good performance across all LPI components

Performance on LPI components differs by

**Bilateral LPI assessments in 2023, by income group**

*Source:* 2023 Logistics Performance Index.

Table **2.1**

overall LPI quintile. The timeliness component outperforms the others in all quintiles except the top one (figure 2.2). And the performance of customs and border agencies and the quality of trade and transport infrastructure are partic- ularly weak in the bottom quintile. The bottom quintile is also characterized by lower quality of logistics services. In the two top-performing quintiles, performance is more consistent across the six components.

Figure **2.2 LPI component scores, by overall LPI quintile, 2023**

Customs Infrastructure

Percent

5

Ease of shipping Quality of arrangements logistics services

Tracking and tracing

Timeliness

4

3

2

1

Bottom quintile

Second quintile

Third quintile

Fourth quintile

Top quintile

*Source:* 2023 Logistics Performance Index.

**The dynamics of LPI scores over 2012–23**

Caution should be used in interpreting changes in scores over time. But examining the full distribu- tion of scores by year can be informative because the analysis can focus on such issues as clustering and dispersion at particular points. In general, the most frequent LPI score has increased over the past decade, which could signal a trend toward rising scores, subject to the caveat that this year’s sample is smaller than in previous years and lacks some smaller, lower income countries (figure 2.3). The change is most pronounced from 2018 to 2023, in particular with the emergence of a sec- ondary, smaller peak at a score of around 3.5. This finding is plausible because four of the six LPI components relate to deep structural factors that are not directly affected by the supply chain crisis. This change means that the survey sample has more countries with strong performance. Perhaps more importantly, the lowest scores have tended to increase, particularly from 2016 to 2023. So, while there is still a considerable range of performance, countries with lower

scores are improving over time.

**What is the impact of the supply chain crisis?**

How is it possible to reconcile the apparent increase in LPI scores over time with the recent

supply chain crisis discussed in chapter 1? The data collection for the LPI is part of the answer. Of the six components that respondents rate, four relate to deep country characteristics that were not affected by the crisis. Difficult supply chain conditions were not related to problems with customs, deficiencies in infrastructure quality, a lack of quality logistics services pro- viders, or difficulties in tracking and tracing shipments. The crisis was due to a combination of supply- and demand-side factors related to the COVID-19 pandemic and efforts to control it. But data for one LPI component suggest that LPI survey respondents were conscious of the new supply chain realities when rating coun- tries. Ratings for the timeliness component fell in all performance quintiles except the second from the top between 2018 and 2023 (figure 4). Given that a key aspect of the supply chain crisis was delays, this finding suggests that the time- liness component captures some of the disrup- tion, subject to the caveat that data collection was undertaken as crisis conditions were easing.

**Logistics performance is determined by more than income**

There is a noticeable gap in LPI scores between high- and low-income countries (figure 2.5). High-income countries have a much higher median LPI score than low-income coun- tries. Moreover, among the 33 top-performing

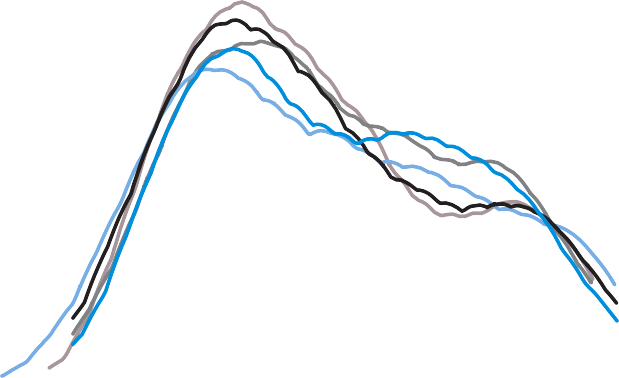


Figure **2.3 Distribution of LPI scores, 2012–23**

Probability density 0.8

2012 2014 2016 2018 2023

0.6

0.4

0.2

0.0

1

2

3

LPI score

4

5

*Source:* 2012, 2014, 2016, 2018, and 2023 Logistics Performance Index.

*Note:* To avoid composition effects, only countries with scores in all years are included in the analysis.

countries in the 2023 LPI, 30 are high income

—a finding that has changed little from past LPI editions, despite the new reality of global trade. This point is about the distribution of scores rather than absolute levels and is thus consistent with the idea that the supply chain crisis is global in scope rather than affecting just a small number of countries or regions.

Nevertheless, countries can still outper- form their income group peers despite the per- formance gap, as indicated by the dispersion of scores within income groups (see figure 2.5). In all groups, there is a wide range of country per- formance. Clearly, a variety of factors beyond income, from policy to private sector develop- ment, affect logistics performance.

Figure **2.4 Timeliness score, by LPI quintile, 2018 and 2023**

Percentage change 5

2018 2023

4

3

2

1

Bottom quintile Second quintile

Third quintile

Fourth quintile

Top quintile

*Source:* 2018 and 2023 Logistics Performance Index.

Figure **2.5 Distribution of 2023 LPI scores by income group**

LPI score 5

4

3

2

1

Low Lower middle Upper middle High

income income income income

*Source:* 2023 Logistics Performance Index.

*Note:* The median is denoted by the bar in the square. The shaded areas are the middle 50 percent of scores.

# Supply chain lead time around the world: Where are the delays?

**CHAPTER**

**3**

The supply chain disruptions of 2021–22 under- score the importance of reliability, which is cap- tured as “timeliness of delivery” in the Logistics Performance Index (LPI) survey (see chapter 2).18 During this recent crisis, firms and con- sumers worldwide experienced goods not arriv- ing on time as expected due to disruptions in vessel movements and to shipments staying at hub and gateway facilities for longer than usual. In an environment of low inventory, unex- pectedly long delivery times can translate into human hardship, as with the shortage of baby formula in the United States19 or fertilizer in Sub-Saharan Africa.20 Addressing disruptions such as these cuts across a wide range of policy areas, but focusing on supply chain manage- ment highlights the importance of time spent at maritime or aviation hubs and gateways. This is one area where investments in produc- tivity, increasing the fluidity of information flow, and enhancing logistics service provision

## can contribute to better outcomes.

The 2023 edition of *Connecting to Compete* seeks to build understanding of these areas by bringing new information derived from a Big Data approach. This chapter provides a global comparison of delays at ports and airports based on massive numbers of observations represent- ing a substantial share of, if not all, actual move- ments. The data come from tracking sources in container shipping, aviation, and postal services. Indicators, expressed as time in days or simple counts, have intuitive meanings and are relat- able to policymakers and practitioners con- cerned with the performance of key logistics hubs or gateways, such as ports and airports. The analysis looks at the composition of total shipment times and their component parts, as well as the reliability of delivery times, mea- sured using indicators of dispersion around a

central tendency, such as the median (box 3.1). The analyses are aggregated at the country level to be relatable to the LPI survey results.

**Lead time dispersion and supply chain reliability**

Understanding the speed of trade, as well as the magnitude and nature of delays, requires look- ing beyond averages. Figure 3.1 breaks down the lead time of containers from entering the port of origin to exiting the port of destination and its variability. Dwell time at hubs and gateways has considerably more dispersion than is observed in international freight transport. On average across all potential routes, a container takes 44 days from entering the port of export to exit- ing the destination port, with a standard devia- tion of 10.5 days. Over 60 percent of this time is spent on ships, with the rest split between stays at ports of export, import, or transshipment.

Yet supply chain legs when containers are not in motion, especially at the port of import, contribute disproportionately to the variability of supply chain lead time. So, while the bulk of the time required to trade goods internationally is accounted for by shipping, the largest contrib- utor to low reliability of delivery times is pro- cesses in the importing country.

Consistent with this analysis, each link of a supply chain is subject to some uncertainty due to factors such as operational constraints, variations in productivity across operators, and process unreliability. One way of capturing the uncertainty is through the statistical distribu- tion of lead time by link.

While different links and modes have dis- tinguishing features, there are also similarities. Figure 3.2 shows the distribution of dwell time for Le Havre (a container port) in 2022 and

**Measuring performance using tracking indicators: Sources and definitions**

Box **3.1**

Since the first Logistics Performance Index (LPI) in 2007, the eco- system of supply chains and logistics services has changed radi- cally, driven largely by digitalization. Through this process, efficient, timely, and accurate digitized data have been translated into knowl- edge that helps create highly interconnected, transparent, and flex- ible supply chain systems. The shift has improved operational ef- ficiency and reduced costs across supply chains.39

Digitalizing supply chain operations generates granular high- frequency datasets by recording data at each step in a supply chain process (box figure). This Big Data approach also brings new busi- ness opportunities (relevant for the private sector) and analytical applications (relevant for both the private and public sectors), which push technological innovation further.

The raw data consist of timestamps of events—such as arrival, departure, loading, and unloading—localized by the United Na- tions Code for Trade and Transport Locations (representing ports, airports, and other facilities). Container trips start with an empty container being sent for stuffing by the exporter and finish with the return of the empty container by the importer. Aviation and postal data have a similar structure, albeit with fewer steps and fewer modal options.

To construct a new set of indicators for the 2023 LPI, the World Bank collaborated with external data providers. The data consist of five high-frequency micro-level datasets: deployment of container liner shipping service from MDS Transmodal, air cargo tracking from Cargo iQ (supported by the International Air Transport Associa- tion), flow of international parcels from the Universal Postal Union, granular information on consignment activities from TradeLens for containerized trade, and worldwide container ship port calls from

an Automatic Identification System data provider (MarineTraffic) (box table 1).

These tracking data are exhaustive for long distance interna- tional trade and cover container trade, air cargo, and parcels but exclude bulk shipping. While the data are global in scope, they are less representative of intraregional trade due to the lack of cover- age of road and rail transport. High-precision tracking systems exist for trucks and freight trains at the country or regional level, but without a global repository, these modes cannot be analyzed in the same way as the others. Yet corridor performance informa- tion is available from container tracking data to and from inland destinations, which represents the trade of landlocked develop- ing countries.

The key performance indicators focus on the major aspects of the data that are important from an international trade perspective: dwell time (delays experienced at the same place, such as at ports, airports, and inland facilities), connectivity information (such as the number of international connections at the origin for a given destina- tion), and trade corridor lead time (time differences between events at different locations) (box table 2; see appendix 4 for information on the source of data and indicator definitions).

The objective of the 2023 LPI is to provide an example of how these detailed micro-data can be used to measure performance, complement existing data including the “classic” LPI, offer policy- relevant insights, and give information to operators on their options for bringing goods to destination. There is scope to extend the ex- ercise to include a broader range of performance indicators and to inform future research that moves beyond measuring trade times only by averages or medians. *(continued)*

**Tracking the supply chain steps**

**Gate out empty**

**Gate in full**

* Gate out (empty)
* Gate in (full)
* Loaded on vessel/ Departure

**Export phase**

**Origin**

**Transshipment phase**

* + Arrival/discharge
  + Loaded/departure

Location is neither origin nor destination

* + Arrival/discharge
  + Gate out (full)
  + Gate in (empty)

**Import phase**

**Destination**

**Gate in empty**

**Gate out full**

Country/location of first full event Country/location of last full event



*Source:* World Bank elaboration based on TradeLens dataset.

**Measuring performance using tracking indicators: Sources and definitions** (continued)

Box **3.1**

**Potential interpretation issues with tracking key performance indicators**

The key performance indicators provide a wealth of information on supply chain transactions across several modes but are subject to limits that affect interpretation:

Although the procedures to input timestamps are rigorously defined, the process is not fully automated in some countries and may depend on practices by local operators, more so for aviation and postal data than for maritime data. In agreement with the data partners, the data do not include countries where there is a strong suspicion of deficient recording.

The postal data date from 2019 (the most recent year available at the time of report writing). All other data were collected over six months in mid-2022, when global supply chains were still experienc- ing severe disruptions—for instance due to the ongoing effects of the COVID-19 pandemic and Russia’s invasion of Ukraine.

There may be selection bias in the container tracking data (TradeLens). Economic operators with more efficient supply chains use advanced digital tracking solutions. This means that the con- tainer data, although massive, may underestimate delays.

The tracking data cover the responsibility of international carri- ers, not logistics by shippers upstream or consignees downstream. Supply chain practices vary across the world. Inefficient practices, such as early stripping of containers or compulsory warehousing, may be imperfectly reflected in the key performance indicators, such that delays may be underestimated.

The concepts used locally to measure delays may differ from the definitions used here to ensure global comparability. For in- stance, in many places, shipments are trucked from port terminals to satellite facilities in the same location. The key performance in- dicators merge the time spent at all facilities in the same port area, not just port terminals.

The port dwell time statistics exclude transshipped containers to other destinations for ports of transshipment.

These indicators measure different dimensions than indica- tors related to port and shipping already available from the World Bank and the United Nations Conference on Trade and Develop- ment (UNCTAD).

The World Bank publishes the Container Port Performance Index, which measures the productivity of terminal handling op- erations.1 Dwell time measures how long containers stay at the port premises, which reflects other factors beyond productivity, includ- ing time to clear and incentives to remove containers fast.

UNCTAD publishes the Liner Shipping Connectivity Index, which averages several components, including the number of mari- time connections proposed here in the LPI 2023, from the same

**Data sources and partners**

|  |  |  |
| --- | --- | --- |
| **Source name** | **Description and coverage** | **Data nature and period of observation** |
| MDS  Transmodal | Deployed capacity and information on ship parameters and operators servicing countries by regular containerized liner shipping services. | Deployed capacity and the list of countries that are connected to each other through direct liner shipping services (first and second quarters of 2022) |
| Cargo iQ | System of shipment planning and performance monitoring for air cargo based on definitions of common business processes and milestones. | Time difference between notification for readiness and delivery to consignee/agent (four quarters of 2019 and second quarter of 2022) |
| Universal Postal Union | Data from the Express Mail Service Events message category of the Electronic Data Interchange protocol used to track individual express mail service and parcel items, as well as registered, insured, and express letters. | Time difference between arrival at inward office of exchange and attempted and final delivery (2019) |
| TradeLens | Blockchain-based data- and document- sharing platform aiming at simplifying and speeding trade workflows for participants in the supply chain ecosystem. The TradeLens dataset used covers about 20 percent of global containerized shipping during the period covered (May–October 2022). | Timestamps of transport events associated with each consignment and container (May–October 2022) |
| MarineTraffic | Port calls for all container ships based on Automatic Identification System data. | Location, arrival, and departure dates of ships (January–July 2022) |

**Definition of key performance indicators**

Box table **2**

Box table **1**

|  |  |  |
| --- | --- | --- |
| **Indicator** | **Source** | **Definition** |
| *Connectivity* |  |  |
| Maritime connectivity | MDS  Transmodal | Number of partner countries accessible through direct service |
| Aviation connectivity | Cargo iQ | Number of direct air connections (countries) |
| Postal connectivity | Universal Postal Union | Number of international postal connections (countries) |
| *Time* |  |  |
| Port dwell time | TradeLens | Time a container unit spends at a port (export or import) |
| Consolidated dwell time | TradeLens | Port dwell time plus time spent at inland multimodal clearance facilities for a container |
| Aviation dwell time | Cargo iQ | Time goods spend at an airport |
| Postal delivery time | Universal Postal Union | Delivery time of a postal item from arrival at country’s postal office of exchange to final (or first unsuccessful attempted) delivery to recipient |
| Corridor lead time | TradeLens | Lead time of containers from port of origin to destination, estimated for selected landlocked countries |
| Turnaround time | MarineTraffic | Time container ships call at a port, excluding waiting time at anchorage |

source. Here, choosing the number of connections facilitates com- parisons across modes.

**Note**

1. World Bank 2021a.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |
|  |  |  |  |
|  |
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|  |
|  |  |  |
|  |  |

for postal delivery of parcels and express mail service courier shipments by air from Singapore to Thailand. In both cases, the distribution is asymmetric relative to a normal distribution (or bell curve). In particular, they have long right tails, which means that lengthy lead times relative to the average or median are common. Major delays are therefore part of the supply

chain experience across modes. Major delays create risks that operators need to manage and that policymakers need to be aware of.

Some of this variability in dwell times may be connected with factors under the control of the owner of the goods or the freight forwarder (such as scheduling), but other factors may be out of their control (such as uncertainty as to when goods will be loaded and unloaded or cleared). So, dispersion of lead time reflects the overall reliability of the supply chain for the link under review21 or, if aggregated, for the entire country. Traders facing the possibility of long delays must bear extra costs in establish- ing reliable connections to suppliers and buyers in foreign markets. From a policy perspective, this suggests that interventions targeting supply chain reliability at trade gateways have the most impact on the costs of trade, though these delays constitute a small fraction of the overall supply chain lead time.22

Figure **3.1 Import lead time is the largest driver of variability in international shipping in 2022**

Percent

100

Export Shipping Transshipment Import

75

50

25

0

Lead time

Variance

*Source:* TradeLens and World Bank modeling.

*Note:* Based on 2.5 million container movements that are representative of global container shipping trade lanes worldwide between May 2022 and October 2022. The model averages mean time and variability over all links in the maritime supply chains (port dwell time and lead time between pairs of ports), weighted by the number of observations for each. The estimation assumes that the performance of subsequent legs is statistically independent.

For each key performance indicator,

the report provides estimates of the mean and quartiles (first, median, and third). The interquartile range of lead time (from the first quartile to the third) is a robust measure of dispersion. With import dwell time, disper- sion measured by interquartile range is compa- rable to the median. In addition to dispersion of times for deliveries at individual locations,

Figure **3.2 Examples of the distribution of import dwell time**

**Container port (Le Havre, May–October 2022)**

Number of consignments

1,000

Mean

Median

800

**Postal delivery (Singapore–Thailand, 2019)**

Number of tracked items

5,000

Median

Mean

4,000

600

3,000

400

2,000

200

1,000

0 0

10

20

Import dwell time (days)

30

40

0 0

2

4

6

8

10

Delivery time (days)

*Source:* TradeLens and the Universal Postal Union.

*Note:* The distribution for the container port example excludes 67 outliers, and the distribution for the postal delivery example excludes 55 outliers.

there is considerable variation in average dwell times across locations. This feature of the data is independent of the mode of transport (figure 3.3). Still, aviation dwell time is notably lower than container dwell time.23 Understanding the reasons for the dispersion to identify measures that improve performance is an important area for future research. Similarly, analyzing the fac- tors that influence the different shapes of the distributions between ports and airports will be important for informing policy.

**Dwell time and logistics performance**

Port dwell time has a subtle connection to logis- tics performance. Most countries—low, middle, and high income—have similar average dwell times (4–8 days) (figure 3.4). A few outliers have a high dwell time with low logistics per- formance. Long delays imply low logistics per- formance, but low logistics performance does not necessarily imply long delays.

Figure **3.3 Dispersion of mean dwell time across the world**

**Ports (May–October 2022) Airports (fourth quarter of 2019)**

Number of ports Number of airports

60 120

50

100

40

80

30

60

20

40

10

20

0 0

10

20

30

0 0

5

10

15

20

25

Mean dwell time (days) Mean dwell time (days)

*Source:* TradeLens and Cargo iQ.

*Note:* Data on ports cover 370 ports, and data on airports cover 470 airports that had at least 120 records.

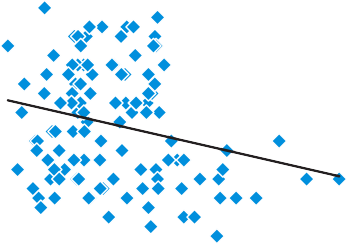
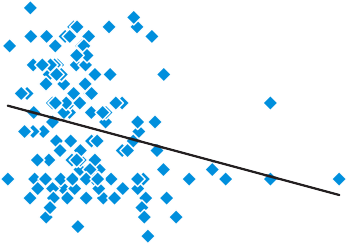


Figure **3.4 Import and export dwell time of containers, May–October 2022, versus 2023 LPI score, by country**

**Imports**

**Exports**

2023 LPI score 2023 LPI score

5 5

4

4

3

3

2

2

1 0

10

20

Mean import dwell time (days)

30

40

1 0

5

10

15

20

25

Mean export dwell time (days)

*Source:* TradeLens and World Bank.

The lack of differentiation between lower- and higher-income countries points to a com- plex picture. The average dwell time for con- tainers between May and October 2022 was 3 days for India and Singapore and 4 for the United Arab Emirates and South Africa but 7 for the United States and 10 for Germany. One explanation could be that the period for these estimates coincides with the tail end of an unprecedented supply chain crisis. Not only did ships have to wait before being serviced, but containers had to wait for trucks to be re- moved. Furthermore, sanctions against Russia (in response to its invasion of Ukraine), which disconnected it from most container shipping services, explain the high container dwell time in some countries around the Baltic Sea, such as Finland.

Another possibility is that some emerging economies invested more recently in modern fa- cilities and technologies, leapfrogging industri- alized countries. For example, since 2015, India has invested in soft and hard infrastructure to connect ports on both coasts to economic poles in the hinterland, including a supply chain vis- ibility platform delivered through a public–pri- vate partnership (box 3.2). The poor perfor- mance of US ports in terms of productivity has received much scrutiny in recent months,24 in- cluding specific productivity constraints, com- pounding the factors referred to in the previous paragraph. Finally, many small economies—for example, small island states25—see only small volumes that can be handled relatively quickly.

Export dwell time of container ports follows the same dispersion patterns and connection to LPI scores as import dwell time—but for differ- ent reasons. Overall, export and import dwell times are positively associated, but with consid- erable dispersion around the average relation- ship, resulting in a correlation of only 0.1 (figure 3.5). Exports are less scrutinized by border agen- cies than imports, but they face a hard schedul- ing constraint and depend on the quality and sophistication of available logistics services. Ex- port containers must reach the port in advance to catch the ship they are scheduled to take. The worse the inland logistics or the lower the fre- quency of shipping, the more buffer time the exporter includes to avoid missing the shipping connection. For containers, shipping lines and terminal operators typically impose deadlines of 48 hours ahead of scheduled ship departure.

**What causes long port delays?**

Few countries other than landlocked ones with port delays in the transit country have excessive import port dwell times (more than 12 days). Most countries with excessive dwell times are in the Middle East and North Africa and in Central and West Africa (figure 3.6). Countries with excessive dwell times likely face serious constraints in port infrastructure and terminal productivity, as measured by the World Bank’s Container Port Performance Index.26 Con- trols of import transactions and goods (such as customs and exchange controls) contribute

**India: Boosting performance with supply chain digitalization**

Box **3.2**

Since 2015, the government of India has invested in trade-related soft and hard infrastructure con- necting port gateways on both coasts to the eco- nomic poles in the hinterland. Technology has been a critical component of this effort, with implementation under a public-private partner- ship of a supply chain visibility platform,1 which contributed to remarkable reductions of delays. NICDC Logistics Data Services Limited applies radio frequency identification tags to containers

and offers consignees end-to-end tracking of their supply chain. Implementation started in 2015 on the Indian east coast and was general- ized in 2020. With the introduction of cargo track- ing, dwell time in the eastern port of Visakhapat- nam fell from 32.4 days in 2015 to 5.3 days in 2019.

**Note**

1. See <https://nldsl.in/>.

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|  |  |  |  |  |  |

Figure **3.6 Outliers for import dwell time and comparators, May–October 2022**

**Ports**

**Countries**

India Singapore

United Arab Emirates

United States Netherlands

… Lebanon Benin Finland Sudan Albania Haiti Libya

Egypt, Arab Rep.

Nigeria Syrian Arab Republic

Cameroon Congo, Dem. Rep.

Tunisia Algeria

Singapore United States

United Arab Emirates

Germany

… Zimbabwe Benin Djibouti Jamaica Nigeria Sudan Ghana Gabon

Egypt, Arab Rep.

Angola Algeria

0 5

10

Import dwell time (days)

15

20

0

2 4

6 8 10

Import dwell time (days)

*Source:* World Bank estimate from TradeLens and Cargo iQ data.

*Note:* For ports, outliers are countries with import dwell times of more than 12 days, and for airports, outliers are countries with import dwell times of more than 4 days.

to delays, as does abuse of port space as storage by importers in some African countries, espe- cially those where terminal fees are low.27 The removal of units in congested port cities may also contribute to delays. Yet each outlier needs to be assessed on a case-by-case basis to deter- mine the main reasons for delays. For instance, in Algeria, the most important contribution to dwell time is the time banks take to validate imports for exchange control purposes prior to submitting an import declaration. By contrast,

Figure **3.5 Export dwell time versus import dwell time of container ports**

Export dwell time (days) 20

15

10

5

0 0

5

10

15

Import dwell time (days)

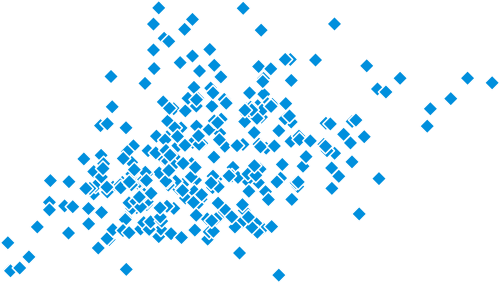
20

25

30

*Source:* TradeLens and World Bank.

*Note:* Data cover 309 ports with more than 100 observations for both exports and imports for May–October 2022.



in Tunisia, low container handling productivity is the binding constraint.28

Aviation dwell times exhibit similar pat- terns to those of maritime dwell times. Exces- sive dwell time for airports is defined as more than 4 days. There is substantial overlap be- tween countries with excessive dwell times in each mode, which points to serious structural issues with logistics performance. In line with expectations, airport delays are one-quarter to one-half as long as port delays.

**Which interventions help reduce these delays?**

The speed of trade can be boosted by combining policy interventions in the LPI pillars related to infrastructure, customs, logistics competence, and tracking and tracing. Diagnosis must be implemented on a country or even port/cor- ridor basis to identify binding constraints and prioritize interventions.

A combination of reforms to enhance port productivity, including private sector participa- tion in terminal operations, could improve the situation in outlier countries.29 Implementing electronic port community systems also im- proves performance by facilitating the flow of information between the numerous participants in port logistics.30 Many underperforming countries have yet to modernize customs and border agencies with a focus on automation, risk management, and integrity.31

The emerging economies with the shortest delays have gone beyond these packages and have implemented bold tracking and tracing so- lutions. India’s very low dwell time (2.6 days) is one example (see box 3.2). The 2023 LPI data partners (see box 1.1 in chapter 1) have proposed similar tracking and tracing solutions.

Measures to speed up the transit of goods require adequate private sector capacity to handle the logistics of goods beyond the gates, and often in the vicinity, of ports, airports, or multimodal facilities. This requires integrated logistics services (such as third party logistics) and proper facilities (such as logistics zones). Adequately regulating logistics services and land planning (zoning) is key to promoting quality and competition. High-performing countries have also invested in education and training, promoting the right skill sets across jobs (blue collar, technical, and administrative managerial), as developed in a World Bank tool- kit applied in several countries.32

Finally, private public dialogue is critical for developing a common fact-based diagnosis and designing impactful interventions. This could involve ad hoc task forces, which should include agencies and stakeholders, tasked with a time-limited mandate. Countries with a strong

logistics sector have permanent institutions, such as Dinalog in the Netherlands.33

**Logistical constraints in landlocked developing countries**

Landlocked developing countries are more logis- tically constrained than their coastal neighbors. The development challenges of landlocked devel- oping countries have been a constant focus of international organizations and assistance pro- grams.34 The key performance indicators in this report provide information on the time it takes containers to reach landlocked countries through transport corridors that link them to ports in transit countries. Data are available for landlocked African, European, and South Asian countries.

Relevant key performance indicators for land- locked developing countries include dwell time at port of entry, consolidated dwell time adding to port dwell time at inland facilities, and lead time on corridors (which combines time in actual mo- tion with, for instance, idle time at land border crossings) (see appendix 2). While covering the bulk of international trade for landlocked devel- oping countries, these data are less representative for EU countries, where direct trucking is favored over containerized trade to destination facilities.

Landlocked developing countries face three types of delays:

* Longer delays in ports than in correspond-

ing coastal countries. A first explanation might be the additional complexity of or- ganizing removal of containers from a dis- tance, as opposed to local removal. Often ports in the country of transit offer longer free time for containers destined for a land- locked country.35

* Corridor delays, which reflect the efficiency of the transit system. Nepal and Mali tend to have the longest corridor delays (over a week), while in East and Southern African landlocked developing countries the delays tend to be much shorter.
* Overall dwell time inland, including at the

destination.

Improving the connectivity of landlocked developing countries goes beyond unilateral policy interventions. Central to landlocked

connectivity is the design of transit systems.36 Transit systems regulate freight services, nota- bly trucking, combining quality-oriented regu- lation of entry and operations (typically from the perspective of customs security). Transit systems also provide for cross-border traceability of ship- ments for customs purposes. Modern transit sys- tems, such as in the European Union, promote regionally integrated markets of authorized operators that meet quality and environmental requirements, along with interoperability of fi- nancial guarantees across borders and digitaliza- tion of transit manifests. The benchmark of an efficient transit system is the Transports Inter- nationaux Routiers (International Road Trans- port, or TIR). That system is superseded by the European transit system in Western Europe but remains important to countries in Central Asia and the Middle and North Africa. Few regions beyond Europe have been able to follow the TIR model, though one exception is the International Transit of Goods in Central America.37

**Connectivity and logistics performance in small maritime economies**

The key performance indicators measure con- nectivity for each mode (container shipping, aviation, and postal) as a simple count of the

international partners (that is, countries) that a country connects to. The United Nations Conference on Trade and Development’s Liner Shipping Connectivity Index combines more subindicators (such as number of services and shipping alliances) from the same sources.38 Connectivity metrics are closely associated with logistics performance, especially for top performers and countries with high liner ship- ping connectivity (figure 3.7). LPI scores are more strongly associated with the connectivity- related key performance indicators than with the delay-related key performance indicators.

Logistics connectivity enhances logistics performance through several channels. First, it increases exposure to global operators and practices, with positive spillovers on the qual- ity of domestic services. Second, it implies that logistics operators have to deal with a more com- plex set of operations with more partners, which incentivizes higher productivity and use of tech- nology. Third, increased connectivity means more operators and competition.

Conversely, countries with limited connec- tions, such as small island states, require attention. Their limited connections means that they de- pend on transshipments to access major markets. Viewed across all countries, about 44 percent of containers are shipped port-to-port; the majority require transshipment (figure 3.9). Distribution of

Figure **3.7 The association between average connectivity in container shipping and 2023 LPI score quintiles**

Average number of partners 60

40

20

0

Bottom quintile (lowest performance)

Fourth quintile (low performance)

Third quintile Second quintile Top quintile (average performance) (high performance) (highest performance)

*Source:* World Bank calculations based on data from MDS Transmodal.

*Note:* Connectivity data refer to the second quarter of 2022.

Figure **3.8 The association between average inbound connectivity in aviation and postal services and 2023 LPI score quintiles**

Number of partners

150

Aviation Postal

100

50

0

Bottom quintile (lowest performance)

Fourth quintile

Third quintile

(low performance) (average performance)

Second quintile Top quintile (high performance) (highest performance)

*Source:* World Bank calculations based on data from Cargo iQ and UPU.

*Note:* Postal connectivity data refer to 2019. Country-level aviation connectivity data refer to the second quarter of 2022.

Figure **3.9 Most maritime economies have less than 20 shipping connections and depend on transshipment**

**Distribution of maritime connectivity, second quarter of 2022**

Number of countries 30

**Number of transshipments per container trip, May 1 to October 31, 2022**

Three or more

6%

25

Two

20 12%

15

None 44%

10

One 38%

5

0 0

20

40

60

80

100

Number of partners

*Source:* World Bank calculations based on data from MDS Transmodal and TradeLens.

*Note:* Connectivity is the number of direct international container shipping connections without transshipment.

dwell time in transshipment follows the same dis- persion patterns as those for export and import. Hence, the more dependent a country is on trans- shipment, the more it suffers additional delays and unreliability, increasing the cost of trade.

The connectivity of island states—even more than that of landlocked developing

countries—depends on factors beyond their policy realm. Competition in shipping mar- kets, logistics and shipping network structure, and frequency of services are difficult to influ- ence and may not yet have received sufficient attention from policymakers and international organizations.

# 4 Conclusions

**CHAPTER**

**Global supply chains have turned out to be surprisingly resilient during the recent disruptions**

Given the recent supply chain crisis, the relative pattern of LPI scores in 2023 across countries has changed little compared with previous edi- tions; only scores in the timeliness component have deteriorated slightly since 2018. In addi- tion to the robust nature of the data underlying the LPI (box table 1 in box 3.1 of chapter 3), there are several possible explanations.

First, when almost every country is affected by similar disruptions beyond their control al- most simultaneously, it is difficult to assign the impact to individual countries.

Second, survey data were collected when supply chain disruptions had already substan- tially diminished, as indicated by the Global Supply Chain Pressure Index,40 for example. The index peaked at the end of 2021 before re- turning to normal levels in September 2022, when the LPI survey went live. This may have contributed to recency bias among respondents. Third, most LPI components relate to struc- tural factors that are not directly affected by supply chain disruptions. Trade logistics per- formance may have improved due to policy re- forms and private sector capacity building over time, despite the constraints imposed by recent conditions. In other words, today’s performance should be higher than what it was five years ago, but the impact of the supply chain crisis may have prevented some of this development from

showing up in the survey data.

Fourth, most shippers, logistics service pro- viders, and authorities have absorbed the im- pacts of the recent crisis well. In the big picture, trade logistics operations have been surprisingly resilient.

**The top and bottom performers: Performance is steady or improving, but the gap persists**

Since the 2018 LPI, global logistics networks have experienced unprecedented disruptions, and the operational environment in logistics has grown more complex. Yet logistics performance in 2022, as measured by LPI scores for the 139 countries covered, remained stable or improved slightly. At the same time, the gap between the top and bottom performers widened slightly, as measured by average LPI scores by quintile. Thus the fundamental messages of previous edi- tions hold true.

Countries in the bottom performance quintile still need core reforms and modern- ization, especially in soft infrastructure such as customs and border management and opera- tional procedures in ports. Investments in hard transport infrastructure are also needed—but they must be aligned with the reforms and in- vestments in soft infrastructure to improve lo- gistics performance.

Countries in the middle performance quintile and the second quintile from the top likely face the most challenging policy agenda in view of their available resources. They need to reconcile the need for consistency and depth of reforms with a set of priorities wider than those facing top performers, which are farther along, or countries in the bottom two quintiles, which can focus on fewer issues.

**Consistency is an important driver of logistics performance**

The leading countries in overall logistics perfor- mance exhibit strong performance across all six LPI components. Lower performing countries

tend to have patchier performance across com- ponents. This distinction highlights the need for reforms in logistics markets to cover a variety of areas rather than focus on just one. For instance, building physical infrastructure without develop- ing service provider capacity would be unlikely to lead to the expected economic benefits.

Hence, a key lesson of the LPI for low- and middle-performing countries is that their re- form agenda needs to encompass not only phys- ical infrastructure but also border procedures and private sector development. Information flow is key to designing effective policy reforms, which means that both the logistics industry and users of logistics services need a voice in the reform process.41

**Logistics performance and key performance indicators derived from a Big Data approach**

Chapter 3 introduced a set of key performance indicators derived from a Big Data approach and related to actual movements of interna- tional trade by mode (container, air freight, and parcels) complement survey-based LPI scores. No single indicator can fully explain country- wide logistics performance, but the key per- formance indicators provide partial informa- tion that policymakers and operators can easily interpret on such topics as delays for specific supply chain links (a port, for example) or the number of connections.

LPI scores are closely associated with the number of direct international connections through shipping, air, or postal networks, espe- cially for top logistics performers and countries with high liner shipping connectivity. Logistics connectivity enhances logistics performance

—for example, by increasing exposure to global operators and practices—with positive spillovers on the quality of domestic logistics services through higher productivity and use of latest technology. Increased connectivity usu- ally also means more operators and competition. Beyond averages, the new data provide de- tailed information on the structure of delays such as distribution of time spent at ports or air- ports. Dwell time at hubs and gateways—when

containers are not in motion—contributes dis- proportionately to the variability of lead time and reduce supply chain reliability. This sup- ports the policy focus on trade facilitation and on soft and hard infrastructure at trade gate- ways and hubs, such as ports and multimodal facilities. These interventions may both reduce trade times and increase supply chain reliability. Delay key performance indicators, such as port dwell time, point to a more complex pic- ture because they are less strongly associated with income group than LPI score is. That in- dustrialized economies often have longer delays than emerging economies will have to be con- firmed over time, as it may reflect the magnitude of the supply chain disruptions of 2021–22 in

Europe and North America.

Three groups of countries with outlying key performance indicators overlap with the bottom two LPI score quintiles and require specific pol- icy attention. They include maritime countries with large dwell times, most of which are located in the Middle East and North Africa as well as Sub-Saharan Africa; landlocked developing countries, which experience additional inland delays, as well as longer delays than the transit country at the port of entry; and countries with limited maritime connectivity, which are heavily penalized by delays in multiple transshipments. The World Bank intends to produce these new key performance indicators annually and to expand the scope of supply chain features that they cover. The current report does not exhaust the potential for research on global logistics based on micro-data. Further research on reli- ability, value of time, and connections between delays and other outcomes such as port produc- tivity, international connectivity, and even regu-

lations should be considered.

**Policymaking priorities when managing logistics as a sector of the economy**

Improving logistics performance requires coun- tries to consider it a cross-cutting policy area. The work crosses the administrative boundaries of transportation, commerce, infrastructure, indus- try, finance, social issues, and the environment.

Chapter 4 Conclusions

And it requires mechanisms that involve the pri- vate sector and the ability to absorb best practices from high-performing countries.

The complexity of these issues highlights the need for detailed research using the best avail- able data, including the tracking data presented in chapter 3. One question relates to the extent to which trade facilitation practices around the world increase reliability and reduce average lead times. No high-quality quantitative evi- dence explains how much unreliable delivery times contribute to higher trade costs that hold back international integration.

Quantifying the social costs and benefits of supply chain characteristics—such as length, di- versity, network characteristics, and resilience— has become important in light of recent disrup- tions. Developing policy-relevant tools could help decisionmakers identify instances where policy could play a constructive role in increas- ing logistics performance. Academic research has touched on these areas, but there is a global public goods case for developing specific policy- relevant insights that can support updated and innovative toolkits for policymakers.

Logistics creates new concerns because of its environmental footprint. Some logistics regula- tions apply to movements of goods as well as to facilities and assets. Those regulations may also influence competition at both the national and international levels. Strengthening the legal and regulatory status of logistics as a sector of the economy is likely to be most important in coun- tries in the middle performance quintile and the second quintile from the top.

The need to attract skilled people to logis- tics jobs has become acute, especially in devel- oped countries—and not just because of the experiences during the COVID-19 pandemic. In many parts of the world, there is an almost endemic lack of truck drivers, warehouse staff, and seagoing personnel.

**The 2020s is a decade of transformation for global supply chains**

Effective supply chains have enabled unprec- edented growth of globalization over the past

decades. Relying on reliable, affordable, and high-capacity logistics services, globally minded manufacturers have expanded their operations in new and existing markets. However, the 2020s are turning into a period of transforma- tion for global supply and value chains, which have turned out to be surprisingly resilient dur- ing the recent disruptions.

First, fundamental trends such as decarbon- ization, sustainability, and growing digitaliza- tion predate the recent supply chain turmoil. Second, the recent increase in the use of trade instruments in geopolitics; manufacturing job losses in advanced economies; disruptions to supplies of food, energy, pharmaceuticals, and semiconductors; and countries’ failure to align incentives to curb greenhouse gas emissions are affecting the pace and nature of global trade. These events, among others, have raised the pro- file of supply chain management and logistics and have accelerated the path of transformation. Businesses and governments are concerned about increasing the resilience and robustness of supply chains, in addition to efficiency—in particular, where goods of primary necessity are concerned (see box 1.1 in chapter 1). One way to do this is to seek jurisdictions where supply chain operations are less exposed to risk. Other means are tightening vertical integration (such as buying up suppliers that firms rely on), diver- sifying the supplier base, and building up inven-

tory buffers along the supply chain.

In addition, the regulatory pressure to re- duce logistics-related harmful emissions ap- pears to be the main driver for stakeholders to switch to more environmentally friendly pro- cesses or equipment, especially when it can be combined with economic savings. But pressure from demand is growing, especially in high-per- formance countries (figure 4.1). Hence, imple- mentable “green logistics” policies have become more important.

Efficient management and use of informa- tion technology solutions in both the private and public sectors are tools for high-quality lo- gistics. Here, the importance of digitalization is growing, boosted by the rapid advancement of software, hardware, and innovation. One ob- vious area of development is to increase supply

Figure **4.1 Demand for environmentally friendly shipping options, by destination LPI score quintile**

Percent

100

Often or nearly always Sometimes Hardly ever or rarely

80

60

40

20

0

Bottom quintile

Fourth quintile

(lowest performance) (low performance)

Third quintile Second quintile Top quintile (average performance) (high performance) (highest performance)

*Source:* 2023 Logistics Performance Index.

*Note:* Refers to the percentage of countries in each quintile reporting the listed average responses, based on how often shippers ask for environmentally friendly options when shipping to destination countries in each group.

chain visibility, the benefits of which were made clear by the recent turmoil. Managing Big Data approaches also brings new business opportu- nities, as well as analytical applications, which push technological innovation further. More efficient use of Big Data approaches is an in- creasingly important policy issue both domesti- cally and in trade facilitation. Yet digitalizing

supply chain processes can pose challenges for low- and middle-income countries, where access to technology and reliability of basic infrastruc- ture (particularly electricity), may constrain the ability to access them. Building capacity, ensur- ing access to appropriate technologies, and sup- porting infrastructure need to remain part of the policy agenda.

# Notes

1. The six LPI components are the efficiency of customs and border management clearance, the quality of trade and transport infrastructure, the ease of arranging competitively priced shipments, the competence and quality of logistics services, the ability to track and trace consignments, and the frequency of on-time deliveries.
2. While the Covid-19 induced supply chain crisis had largely subsided by the time of the survey, many of the respondents’ perceptions were likely to have been influenced by their experience over previous months.
3. Global GDP grew by 2.6 percent in 2019, decreased by
   1. percent in 2020, and grew by 5.9 percent in 2021. So, global GDP was higher in 2021 than in 2019 ([https://](https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG) [data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG](https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG)).
4. The quintiles have different numbers of countries because of tied scores in some cases.
5. Lead time refers to the duration of a logistics process, irrespective of the location of the initial and end events defining the process. In contrast, dwell time refers to the lead time between the first and last events at the

same location in a supply chain and is used mostly in the context of ports and airports.

1. Transport connections refer to the number of countries a country is connected to by one of the three modes analyzed here (air, shipping, or postal).
2. The question in the LPI survey refers only to how often shippers asked for these options, not how often they were chosen.
3. “Shipper” refers to the owner of goods being transported.
4. World Bank estimate based on Automatic Identification System data.
5. IATA 2022.
6. Beretzky and others 2022.
7. UNCTAD 2021a.
8. Beretzky and others 2022.
9. The cross-country datasets measure exports, shipping, and imports. The export and import legs help get logistics information between owners of goods and international gateways (ports, airport, and land border crossings).
10. The analysis is in terms of the top 12 countries and the bottom 10 countries because of tied scores at one decimal point.
11. The quintiles have different numbers of countries because of tied scores.
12. The observed differences do not rise to the level of systematic biases. The LPI is based on respondent ratings. It does not weight scores from different income groups or geographic regions differently. The survey engine for the LPI ensures geographic diversity in the respondent base for the countries assessed (see appendix 5 for details on the LPI methodology).
13. “Timeliness of delivery” is defined in the LPI as “the frequency with which shipments reach consignees within the scheduled or expected delivery time.”
14. See <https://www.hhs.gov/formula/index.html>.
15. Shah 2022.
16. Arvis, Marteau, and Raballand 2010.
17. The economic literature has identified time as a major determinant of country-level export performance. Djankov, Freund, and Pham (2010) focus on time spent at the border, while Hummels and Schaur (2013) examine transport time between exporting and importing countries. However, there has been no good identification of the role of dispersion in time or reliability. Future research could examine this question in detail, as existing studies do not focus on reliability, even when they use highly detailed data comparable to those presented here (for example, Volpe Martincus, Carballo, and Graziano 2016).
18. See https://resilientmaritimelogistics.unctad.org/.
19. Lynch 2021.
20. The practice of stripping containers at ports in some low- and middle-income countries may explain some low dwell time. In the context of island states with low shipping frequencies, consignees are incentivized to move back containers as soon as possible to avoid demurrage fees.
21. World Bank 2022.
22. Raballand and others 2012.
23. World Bank 2020b, 2021b.
24. World Bank 2007.
25. World Bank 2020a.
26. World Bank 2011. The World Bank has published several handbooks to support policy reform in these areas (see World Bank 2010, 2011, 2013, 2014).
27. McKinnon et al. 2017 [add to reference list].
28. See https://[www.dinalog.nl/en/.](http://www.dinalog.nl/en/)
29. See, for example, [https://www.un.org/ohrlls/content/](https://www.un.org/ohrlls/content/landlocked-developing-countries) [landlocked-developing-countries](https://www.un.org/ohrlls/content/landlocked-developing-countries).
30. The data for European landlocked countries point to the same phenomenon. However, it is less representative of the time to trade, unlike in developing countries. Most maritime imports for EU landlocked countries are cleared at the country of entry and reconsolidated to destination rather than containerized to destination.
31. Arvis and others 2011.
32. See [https://www.portaltim.sieca.int/TIM/Portal/archivos/](https://www.portaltim.sieca.int/TIM/Portal/archivos/Manual_PortalTIM.pdf) [Manual\_PortalTIM.pdf](https://www.portaltim.sieca.int/TIM/Portal/archivos/Manual_PortalTIM.pdf).
33. UNCTAD 2021b.
34. See, for example, Gupta and others (2020) and Seyedghorban and others (2020).
35. [https://www.newyorkfed.org/research/policy/gscpi#/overview](https://www.newyorkfed.org/research/policy/gscpi%23/overview).
36. Users of logistics services are owners of goods and customers of logistics service providers.

# 1 2023 LPI results

**APPENDIX**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **LPI** |  |  | **Customs** | | | | **Infrastructure** | | | **International shipments** | | | **Logistics competence and equality** | | | **Timeliness** | | | **Tracking and tracing** | |
| **Economy** | **Grouped rank** | **Score** | **Lower bound** | **Upper bound** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |
| Singapore | 1 | 4.3 | 4.2 | 4.4 |  | 4.2 | 1 |  | 4.6 | 1 |  | 4.0 | 2 |  | 4.4 | 1 |  | 4.3 | 1 |  | 4.4 | 1 |
| Finland | 2 | 4.2 | 4.0 | 4.4 |  | 4.0 | 4 |  | 4.2 | 5 |  | 4.1 | 1 |  | 4.2 | 3 |  | 4.3 | 1 |  | 4.2 | 3 |
| Denmark | 3 | 4.1 | 4.0 | 4.2 |  | 4.1 | 2 |  | 4.1 | 9 |  | 3.6 | 14 |  | 4.1 | 9 |  | 4.1 | 10 |  | 4.3 | 2 |
| Germany | 3 | 4.1 | 4.0 | 4.2 |  | 3.9 | 7 |  | 4.3 | 3 |  | 3.7 | 8 |  | 4.2 | 3 |  | 4.1 | 10 |  | 4.2 | 3 |
| Netherlands | 3 | 4.1 | 4.0 | 4.2 |  | 3.9 | 7 |  | 4.2 | 5 |  | 3.7 | 8 |  | 4.2 | 3 |  | 4.0 | 17 |  | 4.2 | 3 |
| Switzerland | 3 | 4.1 | 4.0 | 4.2 |  | 4.1 | 2 |  | 4.4 | 2 |  | 3.6 | 14 |  | 4.3 | 2 |  | 4.2 | 4 |  | 4.2 | 3 |
| Austria | 7 | 4.0 | 3.8 | 4.2 |  | 3.7 | 14 |  | 3.9 | 16 |  | 3.8 | 4 |  | 4.0 | 11 |  | 4.3 | 1 |  | 4.2 | 3 |
| Belgium | 7 | 4.0 | 3.9 | 4.1 |  | 3.9 | 7 |  | 4.1 | 9 |  | 3.8 | 4 |  | 4.2 | 3 |  | 4.2 | 4 |  | 4.0 | 16 |
| Canada | 7 | 4.0 | 3.9 | 4.1 |  | 4.0 | 4 |  | 4.3 | 3 |  | 3.6 | 14 |  | 4.2 | 3 |  | 4.1 | 10 |  | 4.1 | 11 |
| Hong Kong SAR, China | 7 | 4.0 | 3.9 | 4.1 |  | 3.8 | 12 |  | 4.0 | 14 |  | 4.0 | 2 |  | 4.0 | 11 |  | 4.1 | 10 |  | 4.2 | 3 |
| Sweden | 7 | 4.0 | 3.8 | 4.2 |  | 4.0 | 4 |  | 4.2 | 5 |  | 3.4 | 26 |  | 4.2 | 3 |  | 4.2 | 4 |  | 4.1 | 11 |
| United Arab Emirates | 7 | 4.0 | 3.9 | 4.1 |  | 3.7 | 14 |  | 4.1 | 9 |  | 3.8 | 4 |  | 4.0 | 11 |  | 4.2 | 4 |  | 4.1 | 11 |
| France | 13 | 3.9 | 3.8 | 4.0 |  | 3.7 | 14 |  | 3.8 | 19 |  | 3.7 | 8 |  | 3.8 | 20 |  | 4.1 | 10 |  | 4.0 | 16 |
| Japan | 13 | 3.9 | 3.8 | 4.0 |  | 3.9 | 7 |  | 4.2 | 5 |  | 3.3 | 38 |  | 4.1 | 9 |  | 4.0 | 17 |  | 4.0 | 16 |
| Spain | 13 | 3.9 | 3.8 | 4.0 |  | 3.6 | 20 |  | 3.8 | 19 |  | 3.7 | 8 |  | 3.9 | 14 |  | 4.2 | 4 |  | 4.1 | 11 |
| Taiwan, China | 13 | 3.9 | 3.7 | 4.1 |  | 3.5 | 22 |  | 3.8 | 19 |  | 3.7 | 8 |  | 3.9 | 14 |  | 4.2 | 4 |  | 4.2 | 3 |
| Korea, Rep. | 17 | 3.8 | 3.7 | 3.9 |  | 3.9 | 7 |  | 4.1 | 9 |  | 3.4 | 26 |  | 3.8 | 20 |  | 3.8 | 25 |  | 3.8 | 23 |
| United States | 17 | 3.8 | 3.7 | 3.9 |  | 3.7 | 14 |  | 3.9 | 16 |  | 3.4 | 26 |  | 3.9 | 14 |  | 3.8 | 25 |  | 4.2 | 3 |
| Australia | 19 | 3.7 | 3.5 | 3.9 |  | 3.7 | 14 |  | 4.1 | 9 |  | 3.1 | 47 |  | 3.9 | 14 |  | 3.6 | 35 |  | 4.1 | 11 |
| China | 19 | 3.7 | 3.6 | 3.8 |  | 3.3 | 31 |  | 4.0 | 14 |  | 3.6 | 14 |  | 3.8 | 20 |  | 3.7 | 30 |  | 3.8 | 23 |
| Greece | 19 | 3.7 | 3.5 | 3.9 |  | 3.2 | 37 |  | 3.7 | 25 |  | 3.8 | 4 |  | 3.8 | 20 |  | 3.9 | 21 |  | 3.9 | 20 |
| Italy | 19 | 3.7 | 3.6 | 3.8 |  | 3.4 | 24 |  | 3.8 | 19 |  | 3.4 | 26 |  | 3.8 | 20 |  | 3.9 | 21 |  | 3.9 | 20 |
| Norway | 19 | 3.7 | 3.5 | 3.9 |  | 3.8 | 12 |  | 3.9 | 16 |  | 3.0 | 57 |  | 3.8 | 20 |  | 4.0 | 17 |  | 3.7 | 29 |
| South Africa | 19 | 3.7 | 3.5 | 3.9 |  | 3.3 | 31 |  | 3.6 | 30 |  | 3.6 | 14 |  | 3.8 | 20 |  | 3.8 | 25 |  | 3.8 | 23 |
| United Kingdom | 19 | 3.7 | 3.6 | 3.8 |  | 3.5 | 22 |  | 3.7 | 25 |  | 3.5 | 22 |  | 3.7 | 28 |  | 3.7 | 30 |  | 4.0 | 16 |
| Estonia | 26 | 3.6 | 3.3 | 3.9 |  | 3.2 | 37 |  | 3.5 | 39 |  | 3.4 | 26 |  | 3.7 | 28 |  | 4.1 | 10 |  | 3.8 | 23 |
| Iceland | 26 | 3.6 | 3.4 | 3.8 |  | 3.7 | 14 |  | 3.6 | 30 |  | 3.3 | 38 |  | 3.5 | 38 |  | 3.6 | 35 |  | 3.7 | 29 |
| Ireland | 26 | 3.6 | 3.4 | 3.8 |  | 3.4 | 24 |  | 3.5 | 39 |  | 3.6 | 14 |  | 3.6 | 33 |  | 3.7 | 30 |  | 3.7 | 29 |
| Israel | 26 | 3.6 | 3.4 | 3.8 |  | 3.4 | 24 |  | 3.7 | 25 |  | 3.5 | 22 |  | 3.8 | 20 |  | 3.8 | 25 |  | 3.7 | 29 |
| Luxembourg | 26 | 3.6 | 3.3 | 3.9 |  | 3.6 | 20 |  | 3.6 | 30 |  | 3.6 | 14 |  | 3.9 | 14 |  | 3.5 | 46 |  | 3.5 | 37 |
| Malaysia | 26 | 3.6 | 3.4 | 3.8 |  | 3.3 | 31 |  | 3.6 | 30 |  | 3.7 | 8 |  | 3.7 | 28 |  | 3.7 | 30 |  | 3.7 | 29 |
| New Zealand | 26 | 3.6 | 3.4 | 3.8 |  | 3.4 | 24 |  | 3.8 | 19 |  | 3.2 | 43 |  | 3.7 | 28 |  | 3.8 | 25 |  | 3.8 | 23 |
| Poland | 26 | 3.6 | 3.5 | 3.7 |  | 3.4 | 24 |  | 3.5 | 39 |  | 3.3 | 38 |  | 3.6 | 33 |  | 3.9 | 21 |  | 3.8 | 23 |
| Bahrain | 34 | 3.5 | 3.1 | 3.9 |  | 3.3 | 31 |  | 3.6 | 30 |  | 3.1 | 47 |  | 3.3 | 46 |  | 4.1 | 10 |  | 3.4 | 41 |
| Latvia | 34 | 3.5 | 3.1 | 3.9 |  | 3.3 | 31 |  | 3.3 | 44 |  | 3.2 | 43 |  | 3.7 | 28 |  | 4.0 | 17 |  | 3.6 | 34 |
| Qatar | 34 | 3.5 | 3.1 | 3.9 |  | 3.1 | 43 |  | 3.8 | 19 |  | 3.1 | 47 |  | 3.9 | 14 |  | 3.5 | 46 |  | 3.6 | 34 |
| Thailand | 34 | 3.5 | 3.3 | 3.7 |  | 3.3 | 31 |  | 3.7 | 25 |  | 3.5 | 22 |  | 3.5 | 38 |  | 3.5 | 46 |  | 3.6 | 34 |
| India | 38 | 3.4 | 3.3 | 3.5 |  | 3.0 | 47 |  | 3.2 | 47 |  | 3.5 | 22 |  | 3.5 | 38 |  | 3.6 | 35 |  | 3.4 | 41 |
| Lithuania | 38 | 3.4 | 3.0 | 3.8 |  | 3.2 | 37 |  | 3.5 | 39 |  | 3.4 | 26 |  | 3.6 | 33 |  | 3.6 | 35 |  | 3.1 | 62 |
| Portugal | 38 | 3.4 | 3.1 | 3.7 |  | 3.2 | 37 |  | 3.6 | 30 |  | 3.1 | 47 |  | 3.6 | 33 |  | 3.6 | 35 |  | 3.2 | 54 |
| Saudi Arabia | 38 | 3.4 | 3.2 | 3.6 |  | 3.0 | 47 |  | 3.6 | 30 |  | 3.3 | 38 |  | 3.3 | 46 |  | 3.6 | 35 |  | 3.5 | 37 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **LPI** |  |  | **Customs** | | | | **Infrastructure** | | | **International shipments** | | | **Logistics competence and equality** | | | **Timeliness** | | | **Tracking and tracing** | |
| **Economy** | **Grouped rank** | **Score** | **Lower bound** | **Upper bound** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |
| Türkiye | 38 | 3.4 | 3.3 | 3.5 |  | 3.0 | 47 |  | 3.4 | 43 |  | 3.4 | 26 |  | 3.5 | 38 |  | 3.6 | 35 |  | 3.5 | 37 |
| Croatia | 43 | 3.3 | 3.0 | 3.6 |  | 3.0 | 47 |  | 3.0 | 55 |  | 3.6 | 14 |  | 3.4 | 42 |  | 3.2 | 65 |  | 3.4 | 41 |
| Czechia | 43 | 3.3 | 3.0 | 3.6 |  | 3.0 | 47 |  | 3.0 | 55 |  | 3.4 | 26 |  | 3.6 | 33 |  | 3.7 | 30 |  | 3.2 | 54 |
| Malta | 43 | 3.3 | 3.0 | 3.6 |  | 3.4 | 24 |  | 3.7 | 25 |  | 3.0 | 57 |  | 3.4 | 42 |  | 3.2 | 65 |  | 3.4 | 41 |
| Oman | 43 | 3.3 | 3.1 | 3.5 |  | 3.0 | 47 |  | 3.2 | 47 |  | 3.4 | 26 |  | 3.2 | 53 |  | 3.1 | 76 |  | 3.9 | 20 |
| Philippines | 43 | 3.3 | 3.0 | 3.6 |  | 2.8 | 59 |  | 3.2 | 47 |  | 3.1 | 47 |  | 3.3 | 46 |  | 3.9 | 21 |  | 3.3 | 49 |
| Slovak Republic | 43 | 3.3 | 3.0 | 3.6 |  | 3.2 | 37 |  | 3.3 | 44 |  | 3.0 | 57 |  | 3.4 | 42 |  | 3.5 | 46 |  | 3.3 | 49 |
| Slovenia | 43 | 3.3 | 3.0 | 3.6 |  | 3.4 | 24 |  | 3.6 | 30 |  | 3.4 | 26 |  | 3.3 | 46 |  | 3.3 | 59 |  | 3.0 | 65 |
| Vietnam | 43 | 3.3 | 3.1 | 3.5 |  | 3.1 | 43 |  | 3.2 | 47 |  | 3.3 | 38 |  | 3.2 | 53 |  | 3.3 | 59 |  | 3.4 | 41 |
| Brazil | 51 | 3.2 | 3.1 | 3.3 |  | 2.9 | 56 |  | 3.2 | 47 |  | 2.9 | 68 |  | 3.3 | 46 |  | 3.5 | 46 |  | 3.2 | 54 |
| Bulgaria | 51 | 3.2 | 3.0 | 3.4 |  | 3.1 | 43 |  | 3.1 | 52 |  | 3.0 | 57 |  | 3.3 | 46 |  | 3.5 | 46 |  | 3.3 | 49 |
| Cyprus | 51 | 3.2 | 2.9 | 3.5 |  | 2.9 | 56 |  | 2.8 | 63 |  | 3.1 | 47 |  | 3.2 | 53 |  | 3.5 | 46 |  | 3.4 | 41 |
| Hungary | 51 | 3.2 | 2.9 | 3.5 |  | 2.7 | 65 |  | 3.1 | 52 |  | 3.4 | 26 |  | 3.1 | 57 |  | 3.6 | 35 |  | 3.4 | 41 |
| Kuwait | 51 | 3.2 | 2.9 | 3.5 |  | 3.2 | 37 |  | 3.6 | 30 |  | 3.2 | 43 |  | 2.9 | 65 |  | 2.8 | 101 |  | 3.3 | 49 |
| Romania | 51 | 3.2 | 3.0 | 3.4 |  | 2.7 | 65 |  | 2.9 | 59 |  | 3.4 | 26 |  | 3.3 | 46 |  | 3.6 | 35 |  | 3.5 | 37 |
| Botswana | 57 | 3.1 | 2.6 | 3.6 |  | 3.0 | 47 |  | 3.1 | 52 |  | 3.0 | 57 |  | 3.4 | 42 |  | 3.3 | 59 |  | 3.0 | 65 |
| Egypt, Arab Rep. | 57 | 3.1 | 2.9 | 3.3 |  | 2.8 | 59 |  | 3.0 | 55 |  | 3.2 | 43 |  | 2.9 | 65 |  | 3.6 | 35 |  | 2.9 | 72 |
| North Macedonia | 57 | 3.1 | 2.8 | 3.4 |  | 3.1 | 43 |  | 3.0 | 55 |  | 2.8 | 75 |  | 3.2 | 53 |  | 3.5 | 46 |  | 3.2 | 54 |
| Panama | 57 | 3.1 | 2.9 | 3.3 |  | 3.0 | 47 |  | 3.3 | 44 |  | 3.1 | 47 |  | 3.0 | 61 |  | 3.4 | 55 |  | 2.9 | 72 |
| Bosnia and Herzegovina | 61 | 3.0 | 2.8 | 3.2 |  | 2.7 | 65 |  | 2.6 | 76 |  | 3.1 | 47 |  | 2.9 | 65 |  | 3.2 | 65 |  | 3.2 | 54 |
| Chile | 61 | 3.0 | 2.8 | 3.2 |  | 3.0 | 47 |  | 2.8 | 63 |  | 2.7 | 85 |  | 3.1 | 57 |  | 3.2 | 65 |  | 3.0 | 65 |
| Indonesia | 61 | 3.0 | 2.9 | 3.1 |  | 2.8 | 59 |  | 2.9 | 59 |  | 3.0 | 57 |  | 2.9 | 65 |  | 3.3 | 59 |  | 3.0 | 65 |
| Peru | 61 | 3.0 | 2.8 | 3.2 |  | 2.6 | 74 |  | 2.5 | 80 |  | 3.1 | 47 |  | 2.7 | 81 |  | 3.4 | 55 |  | 3.4 | 41 |
| Uruguay | 61 | 3.0 | 2.7 | 3.3 |  | 2.9 | 56 |  | 2.7 | 68 |  | 2.7 | 85 |  | 3.1 | 57 |  | 3.2 | 65 |  | 3.3 | 49 |
| Antigua and Barbuda | 66 | 2.9 | 2.7 | 3.1 |  | 2.2 | 110 |  | 2.7 | 68 |  | 2.9 | 68 |  | 2.9 | 65 |  | 3.4 | 55 |  | 3.2 | 54 |
| Benin | 66 | 2.9 | 2.5 | 3.3 |  | 2.7 | 65 |  | 2.5 | 80 |  | 2.9 | 68 |  | 3.0 | 61 |  | 2.7 | 109 |  | 3.2 | 54 |
| Colombia | 66 | 2.9 | 2.7 | 3.1 |  | 2.5 | 84 |  | 2.9 | 59 |  | 3.0 | 57 |  | 3.1 | 57 |  | 3.2 | 65 |  | 3.1 | 62 |
| Costa Rica | 66 | 2.9 | 2.8 | 3.0 |  | 2.8 | 59 |  | 2.7 | 68 |  | 2.8 | 75 |  | 2.9 | 65 |  | 3.2 | 65 |  | 2.9 | 72 |
| Honduras | 66 | 2.9 | 2.7 | 3.1 |  | 2.8 | 59 |  | 2.7 | 68 |  | 3.0 | 57 |  | 2.7 | 81 |  | 3.2 | 65 |  | 2.6 | 94 |
| Mexico | 66 | 2.9 | 2.7 | 3.1 |  | 2.5 | 84 |  | 2.8 | 63 |  | 2.8 | 75 |  | 3.0 | 61 |  | 3.5 | 46 |  | 3.1 | 62 |
| Namibia | 66 | 2.9 | 2.3 | 3.5 |  | 2.8 | 59 |  | 2.8 | 63 |  | 3.0 | 57 |  | 2.9 | 65 |  | 2.9 | 93 |  | 2.8 | 80 |
| Argentina | 73 | 2.8 | 2.6 | 3.0 |  | 2.7 | 65 |  | 2.8 | 63 |  | 2.7 | 85 |  | 2.7 | 81 |  | 3.1 | 76 |  | 2.9 | 72 |
| Montenegro | 73 | 2.8 | 2.5 | 3.1 |  | 2.6 | 74 |  | 2.5 | 80 |  | 2.8 | 75 |  | 2.8 | 76 |  | 3.2 | 65 |  | 3.2 | 54 |
| Rwanda | 73 | 2.8 | 2.5 | 3.1 |  | 2.5 | 84 |  | 2.9 | 59 |  | 2.4 | 111 |  | 3.0 | 61 |  | 3.1 | 76 |  | 3.0 | 65 |
| Serbia | 73 | 2.8 | 2.6 | 3.0 |  | 2.2 | 110 |  | 2.4 | 89 |  | 2.9 | 68 |  | 2.7 | 81 |  | 3.4 | 55 |  | 2.9 | 72 |
| Solomon Islands | 73 | 2.8 | 2.4 | 3.2 |  | 2.4 | 90 |  | 2.6 | 76 |  | 2.9 | 68 |  | 2.9 | 65 |  | 3.2 | 65 |  | 2.9 | 72 |
| Sri Lanka | 73 | 2.8 | 2.6 | 3.0 |  | 2.5 | 84 |  | 2.4 | 89 |  | 2.8 | 75 |  | 2.7 | 81 |  | 3.3 | 59 |  | 3.0 | 65 |
| Bahamas, The | 79 | 2.7 | 2.5 | 2.9 |  | 2.7 | 65 |  | 2.5 | 80 |  | 3.1 | 47 |  | 2.5 | 103 |  | 3.0 | 87 |  | 2.6 | 94 |
| Belarus | 79 | 2.7 | 2.4 | 3.0 |  | 2.6 | 74 |  | 2.7 | 68 |  | 2.6 | 91 |  | 2.6 | 92 |  | 3.1 | 76 |  | 2.6 | 94 |
| Djibouti | 79 | 2.7 | 2.5 | 2.9 |  | 2.6 | 74 |  | 2.3 | 108 |  | 2.5 | 102 |  | 2.8 | 76 |  | 3.6 | 35 |  | 2.7 | 87 |
| El Salvador | 79 | 2.7 | 2.5 | 2.9 |  | 2.4 | 90 |  | 2.2 | 118 |  | 2.6 | 91 |  | 2.7 | 81 |  | 3.2 | 65 |  | 2.9 | 72 |
| Georgia | 79 | 2.7 | 2.4 | 3.0 |  | 2.6 | 74 |  | 2.3 | 108 |  | 2.7 | 85 |  | 2.6 | 92 |  | 3.1 | 76 |  | 2.8 | 80 |
| Kazakhstan | 79 | 2.7 | 2.5 | 2.9 |  | 2.6 | 74 |  | 2.5 | 80 |  | 2.6 | 91 |  | 2.7 | 81 |  | 2.9 | 93 |  | 2.8 | 80 |
| Papua New Guinea | 79 | 2.7 | 2.4 | 3.0 |  | 2.4 | 90 |  | 2.4 | 89 |  | 2.6 | 91 |  | 2.7 | 81 |  | 3.3 | 59 |  | 3.0 | 65 |

Appendix 1 2023 LPI results

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **LPI** |  |  | **Customs** | | | | **Infrastructure** | | | **International shipments** | | | **Logistics competence and equality** | | | **Timeliness** | | | **Tracking and tracing** | |
| **Economy** | **Grouped rank** | **Score** | **Lower bound** | **Upper bound** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |
| Paraguay | 79 | 2.7 | 2.5 | 2.9 |  | 2.4 | 90 |  | 2.5 | 80 |  | 2.7 | 85 |  | 2.6 | 92 |  | 3.0 | 87 |  | 2.8 | 80 |
| Ukraine | 79 | 2.7 | 2.4 | 3.0 |  | 2.4 | 90 |  | 2.4 | 89 |  | 2.8 | 75 |  | 2.6 | 92 |  | 3.1 | 76 |  | 2.6 | 94 |
| Bangladesh | 88 | 2.6 | 2.3 | 2.9 |  | 2.3 | 101 |  | 2.3 | 108 |  | 2.6 | 91 |  | 2.7 | 81 |  | 3.0 | 87 |  | 2.4 | 105 |
| Congo, Rep. | 88 | 2.6 | 2.3 | 2.9 |  | 2.3 | 101 |  | 2.1 | 125 |  | 2.6 | 91 |  | 2.9 | 65 |  | 2.9 | 93 |  | 2.7 | 87 |
| Dominican Republic | 88 | 2.6 | 2.3 | 2.9 |  | 2.6 | 74 |  | 2.7 | 68 |  | 2.4 | 111 |  | 2.6 | 92 |  | 3.1 | 76 |  | 2.4 | 105 |
| Guatemala | 88 | 2.6 | 2.4 | 2.8 |  | 2.3 | 101 |  | 2.4 | 89 |  | 2.8 | 75 |  | 2.7 | 81 |  | 2.6 | 116 |  | 2.7 | 87 |
| Guinea-Bissau | 88 | 2.6 | 2.2 | 3.0 |  | 2.7 | 65 |  | 2.4 | 89 |  | 2.9 | 68 |  | 2.9 | 65 |  | 2.4 | 129 |  | 2.3 | 117 |
| Mali | 88 | 2.6 | 2.1 | 3.1 |  | 2.6 | 74 |  | 2.0 | 130 |  | 2.6 | 91 |  | 2.5 | 103 |  | 3.1 | 76 |  | 2.7 | 87 |
| Nigeria | 88 | 2.6 | 2.3 | 2.9 |  | 2.4 | 90 |  | 2.4 | 89 |  | 2.5 | 102 |  | 2.3 | 119 |  | 3.1 | 76 |  | 2.7 | 87 |
| Russian Federation | 88 | 2.6 | 2.5 | 2.7 |  | 2.4 | 90 |  | 2.7 | 68 |  | 2.3 | 121 |  | 2.6 | 92 |  | 2.9 | 93 |  | 2.5 | 98 |
| Uzbekistan | 88 | 2.6 | 2.1 | 3.1 |  | 2.6 | 74 |  | 2.4 | 89 |  | 2.6 | 91 |  | 2.6 | 92 |  | 2.8 | 101 |  | 2.4 | 105 |
| Albania | 97 | 2.5 | 2.1 | 2.9 |  | 2.4 | 90 |  | 2.7 | 68 |  | 2.8 | 75 |  | 2.3 | 119 |  | 2.5 | 124 |  | 2.3 | 117 |
| Algeria | 97 | 2.5 | 2.1 | 2.9 |  | 2.3 | 101 |  | 2.1 | 125 |  | 3.0 | 57 |  | 2.2 | 126 |  | 2.6 | 116 |  | 2.5 | 98 |
| Armenia | 97 | 2.5 | 2.3 | 2.7 |  | 2.5 | 84 |  | 2.6 | 76 |  | 2.2 | 128 |  | 2.6 | 92 |  | 2.7 | 109 |  | 2.3 | 117 |
| Bhutan | 97 | 2.5 | 2.3 | 2.7 |  | 2.7 | 65 |  | 2.2 | 118 |  | 2.3 | 121 |  | 2.6 | 92 |  | 2.6 | 116 |  | 2.3 | 117 |
| Central African Republic | 97 | 2.5 | 1.9 | 3.1 |  | 2.4 | 90 |  | 2.6 | 76 |  | 2.1 | 132 |  | 2.9 | 65 |  | 2.6 | 116 |  | 2.4 | 105 |
| Congo, Dem. Rep. | 97 | 2.5 | 2.2 | 2.8 |  | 2.3 | 101 |  | 2.3 | 108 |  | 2.5 | 102 |  | 2.4 | 110 |  | 2.8 | 101 |  | 2.5 | 98 |
| Ghana | 97 | 2.5 | 2.2 | 2.8 |  | 2.7 | 65 |  | 2.4 | 89 |  | 2.4 | 111 |  | 2.5 | 103 |  | 2.7 | 109 |  | 2.2 | 129 |
| Grenada | 97 | 2.5 | 2.3 | 2.7 |  | 2.6 | 74 |  | 2.5 | 80 |  | 2.6 | 91 |  | 2.2 | 126 |  | 3.1 | 76 |  | 2.3 | 117 |
| Guinea | 97 | 2.5 | 2.3 | 2.7 |  | 2.4 | 90 |  | 2.4 | 89 |  | 2.2 | 128 |  | 2.7 | 81 |  | 2.5 | 124 |  | 2.7 | 87 |
| Jamaica | 97 | 2.5 | 2.3 | 2.7 |  | 2.2 | 110 |  | 2.4 | 89 |  | 2.4 | 111 |  | 2.5 | 103 |  | 2.9 | 93 |  | 2.8 | 80 |
| Mauritius | 97 | 2.5 | 2.3 | 2.7 |  | 2.4 | 90 |  | 2.5 | 80 |  | 1.9 | 137 |  | 2.5 | 103 |  | 3.1 | 76 |  | 2.9 | 72 |
| Moldova | 97 | 2.5 | 2.1 | 2.9 |  | 1.9 | 133 |  | 1.9 | 132 |  | 2.7 | 85 |  | 2.8 | 76 |  | 3.0 | 87 |  | 2.8 | 80 |
| Mongolia | 97 | 2.5 | 2.2 | 2.8 |  | 2.5 | 84 |  | 2.3 | 108 |  | 2.5 | 102 |  | 2.3 | 119 |  | 2.7 | 109 |  | 2.4 | 105 |
| Nicaragua | 97 | 2.5 | 2.2 | 2.8 |  | 2.0 | 129 |  | 1.9 | 132 |  | 2.8 | 75 |  | 2.8 | 76 |  | 2.9 | 93 |  | 2.4 | 105 |
| Tajikistan | 97 | 2.5 | 2.2 | 2.8 |  | 2.2 | 110 |  | 2.5 | 80 |  | 2.5 | 102 |  | 2.8 | 76 |  | 2.9 | 93 |  | 2.0 | 134 |
| Togo | 97 | 2.5 | 2.2 | 2.8 |  | 2.3 | 101 |  | 2.3 | 108 |  | 3.0 | 57 |  | 2.4 | 110 |  | 2.8 | 101 |  | 2.3 | 117 |
| Trinidad and Tobago | 97 | 2.5 | 2.3 | 2.7 |  | 2.2 | 110 |  | 2.4 | 89 |  | 2.5 | 102 |  | 2.4 | 110 |  | 2.9 | 93 |  | 2.5 | 98 |
| Zimbabwe | 97 | 2.5 | 2.3 | 2.7 |  | 2.2 | 110 |  | 2.4 | 89 |  | 2.5 | 102 |  | 2.3 | 119 |  | 2.8 | 101 |  | 2.7 | 87 |
| Bolivia | 115 | 2.4 | 2.2 | 2.6 |  | 2.1 | 120 |  | 2.4 | 89 |  | 2.5 | 102 |  | 2.4 | 110 |  | 2.4 | 129 |  | 2.5 | 98 |
| Cambodia | 115 | 2.4 | 2.0 | 2.8 |  | 2.2 | 110 |  | 2.1 | 125 |  | 2.3 | 121 |  | 2.4 | 110 |  | 2.7 | 109 |  | 2.8 | 80 |
| Gabon | 115 | 2.4 | 2.0 | 2.8 |  | 2.0 | 129 |  | 2.2 | 118 |  | 2.6 | 91 |  | 2.0 | 135 |  | 3.0 | 87 |  | 2.5 | 98 |
| Guyana | 115 | 2.4 | 2.2 | 2.6 |  | 2.3 | 101 |  | 2.4 | 89 |  | 2.1 | 132 |  | 2.6 | 92 |  | 2.6 | 116 |  | 2.2 | 129 |
| Iraq | 115 | 2.4 | 2.2 | 2.6 |  | 2.1 | 120 |  | 2.2 | 118 |  | 2.5 | 102 |  | 2.2 | 126 |  | 3.0 | 87 |  | 2.4 | 105 |
| Lao PDR | 115 | 2.4 | 2.1 | 2.7 |  | 2.3 | 101 |  | 2.3 | 108 |  | 2.3 | 121 |  | 2.4 | 110 |  | 2.8 | 101 |  | 2.4 | 105 |
| Liberia | 115 | 2.4 | 1.8 | 3.0 |  | 2.1 | 120 |  | 2.4 | 89 |  | 2.8 | 75 |  | 2.4 | 110 |  | 2.3 | 133 |  | 2.4 | 105 |
| Sudan | 115 | 2.4 | 2.2 | 2.6 |  | 2.1 | 120 |  | 2.3 | 108 |  | 2.4 | 111 |  | 2.4 | 110 |  | 2.7 | 109 |  | 2.3 | 117 |
| Burkina Faso | 123 | 2.3 | 1.8 | 2.8 |  | 2.0 | 129 |  | 2.3 | 108 |  | 2.4 | 111 |  | 2.4 | 110 |  | 2.4 | 129 |  | 2.2 | 129 |
| Fiji | 123 | 2.3 | 2.0 | 2.6 |  | 2.3 | 101 |  | 2.2 | 118 |  | 2.3 | 121 |  | 2.3 | 119 |  | 2.3 | 133 |  | 2.2 | 129 |
| Gambia, The | 123 | 2.3 | 2.0 | 2.6 |  | 1.8 | 135 |  | 2.3 | 108 |  | 2.6 | 91 |  | 2.3 | 119 |  | 2.6 | 116 |  | 2.4 | 105 |
| Iran, Islamic Rep. | 123 | 2.3 | 2.1 | 2.5 |  | 2.2 | 110 |  | 2.4 | 89 |  | 2.4 | 111 |  | 2.1 | 133 |  | 2.7 | 109 |  | 2.4 | 105 |
| Kyrgyz Republic | 123 | 2.3 | 2.1 | 2.5 |  | 2.2 | 110 |  | 2.4 | 89 |  | 2.4 | 111 |  | 2.2 | 126 |  | 2.4 | 129 |  | 2.3 | 117 |
| Madagascar | 123 | 2.3 | 2.0 | 2.6 |  | 1.8 | 135 |  | 1.8 | 136 |  | 2.9 | 68 |  | 2.2 | 126 |  | 2.6 | 116 |  | 2.0 | 134 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **LPI** |  |  | **Customs** | | | | **Infrastructure** | | | **International shipments** | | | **Logistics competence and equality** | | | **Timeliness** | | | **Tracking and tracing** | |
| **Economy** | **Grouped rank** | **Score** | **Lower bound** | **Upper bound** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |  | **Score** | **Grouped rank** |
| Mauritania | 123 | 2.3 | 1.9 | 2.7 |  | 2.1 | 120 |  | 2.0 | 130 |  | 2.2 | 128 |  | 2.5 | 103 |  | 2.8 | 101 |  | 2.5 | 98 |
| Syrian Arab Republic | 123 | 2.3 | 2.1 | 2.5 |  | 2.2 | 110 |  | 2.2 | 118 |  | 2.3 | 121 |  | 2.2 | 126 |  | 2.5 | 124 |  | 2.3 | 117 |
| Venezuela, RB | 123 | 2.3 | 2.0 | 2.6 |  | 2.1 | 120 |  | 2.4 | 89 |  | 2.0 | 135 |  | 2.5 | 103 |  | 2.5 | 124 |  | 2.3 | 117 |
| Cuba | 132 | 2.2 | 1.8 | 2.6 |  | 2.0 | 129 |  | 2.2 | 118 |  | 2.1 | 132 |  | 2.2 | 126 |  | 2.6 | 116 |  | 2.4 | 105 |
| Yemen, Rep. | 132 | 2.2 | 1.8 | 2.6 |  | 1.7 | 137 |  | 1.9 | 132 |  | 1.7 | 139 |  | 2.6 | 92 |  | 2.8 | 101 |  | 2.3 | 117 |
| Angola | 134 | 2.1 | 1.8 | 2.4 |  | 1.7 | 137 |  | 2.1 | 125 |  | 2.4 | 111 |  | 2.3 | 119 |  | 2.1 | 138 |  | 2.3 | 117 |
| Cameroon | 134 | 2.1 | 1.8 | 2.4 |  | 2.1 | 120 |  | 2.1 | 125 |  | 2.2 | 128 |  | 2.1 | 133 |  | 2.1 | 138 |  | 1.8 | 136 |
| Haiti | 134 | 2.1 | 1.8 | 2.4 |  | 2.1 | 120 |  | 1.8 | 136 |  | 2.3 | 121 |  | 2.0 | 135 |  | 2.5 | 124 |  | 2.1 | 133 |
| Somalia | 137 | 2.0 | 1.7 | 2.3 |  | 1.5 | 139 |  | 1.9 | 132 |  | 2.4 | 111 |  | 1.8 | 139 |  | 2.3 | 133 |  | 1.8 | 136 |
| Afghanistan | 138 | 1.9 | 1.7 | 2.1 |  | 2.1 | 120 |  | 1.7 | 138 |  | 1.8 | 138 |  | 2.0 | 135 |  | 2.3 | 133 |  | 1.6 | 139 |
| Libya | 138 | 1.9 | 1.6 | 2.2 |  | 1.9 | 133 |  | 1.7 | 138 |  | 2.0 | 135 |  | 1.9 | 138 |  | 2.2 | 137 |  | 1.8 | 136 |

*Source:* World Bank.

# Lead time data from supply chain tracking datasets

**APPENDIX**

**2**

**Lead time data for container shipping, 2022**

Table **A2.1**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of services** | **Number of alliances** | **Number of international connections** | **Turnaround time at port (days)** | | **Interquartile range** | **Weighted by ship’s twenty-foot equivalent unit capacity** | |
| **Economy** | **Median** | **Mean** | **Median** | **Mean** |
| Albania | 3 | 0 | 7 | 1.2 | 1.4 | 0.5 | 1.2 | 1.4 |
| Algeria | 25 | 0 | 18 | 2.5 | 3.1 | 2.4 | 2.7 | 3.2 |
| Angola | 11 | 0 | 22 | 2.5 | 3.1 | 2.0 | 3.3 | 3.8 |
| Antigua and Barbuda | 4 | 0 | 22 | 0.5 | 0.5 | 0.1 | 0.5 | 0.5 |
| Argentina | 23 | 0 | 21 | 1.5 | 1.8 | 1.0 | 1.6 | 1.8 |
| Australia | 58 | 0 | 36 | 1.7 | 2.0 | 1.1 | 1.9 | 2.1 |
| Bahamas, The | 17 | 2 | 35 | 1.0 | 1.3 | 1.4 | 1.5 | 1.7 |
| Bahrain | 7 | 1 | 10 | 0.8 | 2.0 | 0.5 | 0.9 | 1.7 |
| Bangladesh | 32 | 0 | 12 | 3.0 | 2.9 | 1.0 | 3.0 | 3.1 |
| Belgium | 114 | 3 | 88 | 1.3 | 1.6 | 1.0 | 1.7 | 1.9 |
| Benin | 16 | 0 | 26 | 1.5 | 1.5 | 0.8 | 1.5 | 1.5 |
| Brazil | 33 | 0 | 34 | 0.8 | 1.0 | 0.5 | 0.9 | 1.0 |
| Bulgaria | 6 | 0 | 8 | 1.0 | 1.3 | 0.5 | 1.0 | 1.1 |
| Cambodia | 12 | 0 | 10 | 0.8 | 0.9 | 0.5 | 0.8 | 1.0 |
| Cameroon | 16 | 0 | 26 | 1.6 | 1.6 | 0.8 | 1.5 | 1.6 |
| Canada | 48 | 3 | 41 | 2.0 | 2.7 | 2.6 | 2.5 | 3.2 |
| Chile | 18 | 0 | 18 | 1.3 | 1.5 | 1.0 | 1.5 | 1.9 |
| China | 590 | 4 | 92 | 0.8 | 1.1 | 0.5 | 1.0 | 1.4 |
| Colombia | 52 | 1 | 55 | 0.6 | 0.7 | 0.4 | 0.8 | 0.8 |
| Congo, Dem. Rep. | 6 | 0 | 7 | 1.8 | 1.8 | 1.4 | 1.0 | 1.7 |
| Congo, Rep. | 15 | 0 | 23 | 1.8 | 2.4 | 1.2 | 1.9 | 2.1 |
| Costa Rica | 27 | 0 | 31 | 0.6 | 0.7 | 0.3 | 0.6 | 0.7 |
| Croatia | 7 | 2 | 15 | 0.8 | 1.1 | 0.9 | 1.7 | 1.6 |
| Cuba | 7 | 0 | 15 | 1.0 | 1.4 | 1.2 | 1.2 | 1.5 |
| Cyprus | 12 | 0 | 13 | 0.6 | 0.7 | 0.5 | 0.7 | 0.8 |
| Denmark | 17 | 1 | 20 | 0.5 | 0.8 | 0.5 | 1.0 | 1.3 |
| Djibouti | 13 | 1 | 24 | 0.8 | 0.8 | 0.4 | 0.8 | 0.9 |
| Dominican Republic | 35 | 1 | 51 | 0.9 | 1.1 | 0.6 | 1.2 | 1.4 |
| Egypt, Arab Rep. | 69 | 3 | 46 | 1.1 | 1.3 | 0.7 | 1.2 | 1.4 |
| El Salvador | 4 | 0 | 7 | 1.2 | 1.3 | 0.4 | 1.2 | 1.3 |
| Estonia | 8 | 0 | 11 | 0.8 | 1.0 | 0.8 | 1.1 | 1.2 |
| Fiji | 14 | 0 | 25 | 1.2 | 1.4 | 0.8 | 1.3 | 1.4 |
| Finland | 30 | 0 | 15 | 1.3 | 1.4 | 1.1 | 1.4 | 1.6 |
| France | 71 | 4 | 76 | 1.1 | 1.5 | 1.1 | 1.7 | 2.0 |
| Gabon | 9 | 0 | 16 | 1.5 | 1.5 | 1.0 | 1.5 | 1.5 |
| Gambia, The | 3 | 0 | 3 | 6.8 | 6.7 | 2.7 | 6.9 | 6.8 |
| Georgia | 5 | 0 | 5 | 1.4 | 1.7 | 0.6 | 1.5 | 1.6 |
| Germany | 119 | 3 | 70 | 1.3 | 1.7 | 1.3 | 2.0 | 2.4 |
| Ghana | 22 | 0 | 29 | 1.1 | 1.2 | 0.5 | 1.1 | 1.2 |
| Greece | 55 | 3 | 44 | 1.2 | 1.4 | 0.7 | 1.3 | 1.4 |
| Grenada | 4 | 0 | 17 | 0.3 | 0.4 | 0.2 | 0.3 | 0.4 |
| Guatemala | 29 | 0 | 19 | 0.6 | 0.7 | 0.5 | 0.7 | 0.8 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of services** | **Number of alliances** | **Number of international connections** | **Turnaround time at port (days)** | | **Interquartile range** | **Weighted by ship’s twenty-foot**  **equivalent unit capacity** | |
| **Economy** | **Median** | **Mean** | **Median** | **Mean** |
| Guinea | 4 | 0 | 10 | 2.0 | 2.0 | 0.8 | 2.0 | 2.0 |
| Guinea-Bissau | 2 | 0 | 4 | 3.9 | 3.5 | 1.1 | 3.7 | 3.5 |
| Guyana | 9 | 0 | 16 | 1.5 | 1.4 | 0.6 | 1.5 | 1.4 |
| Haiti | 10 | 0 | 10 | 0.8 | 0.8 | 0.6 | 0.8 | 0.8 |
| Honduras | 20 | 0 | 13 | 0.5 | 0.6 | 0.3 | 0.5 | 0.6 |
| Hong Kong SAR, China | 183 | 4 | 59 | 0.6 | 0.7 | 0.3 | 0.7 | 0.8 |
| Iceland | 8 | 0 | 10 | 0.6 | 0.8 | 0.9 | 0.8 | 0.9 |
| India | 117 | 2 | 58 | 0.9 | 1.1 | 0.7 | 1.0 | 1.1 |
| Indonesia | 118 | 1 | 17 | 1.1 | 1.8 | 0.9 | 1.1 | 1.5 |
| Iran, Islamic Rep. | 15 | 0 | 11 | 1.1 | 1.7 | 1.0 | 2.0 | 2.9 |
| Iraq | 10 | 2 | 16 | 1.5 | 1.6 | 1.1 | 1.7 | 1.9 |
| Ireland | 23 | 0 | 16 | 1.2 | 1.3 | 1.0 | 1.1 | 1.3 |
| Israel | 36 | 2 | 35 | 1.2 | 1.5 | 1.0 | 1.3 | 1.6 |
| Italy | 94 | 4 | 74 | 1.0 | 1.3 | 1.0 | 1.5 | 1.9 |
| Jamaica | 33 | 0 | 46 | 1.1 | 1.4 | 0.6 | 1.2 | 1.6 |
| Japan | 206 | 3 | 42 | 0.3 | 0.5 | 0.3 | 0.5 | 0.6 |
| Korea, Rep. | 268 | 5 | 78 | 0.7 | 1.0 | 0.6 | 1.0 | 1.3 |
| Kuwait | 8 | 0 | 7 | 0.8 | 0.9 | 0.5 | 0.8 | 0.9 |
| Latvia | 9 | 0 | 10 | 1.3 | 1.4 | 1.1 | 1.4 | 1.5 |
| Liberia | 3 | 0 | 5 | 2.0 | 2.3 | 0.8 | 2.0 | 2.3 |
| Libya | 16 | 0 | 24 | 2.0 | 2.4 | 1.6 | 2.0 | 2.4 |
| Lithuania | 16 | 0 | 23 | 0.7 | 0.8 | 0.5 | 0.9 | 1.1 |
| Madagascar | 8 | 0 | 9 | 0.9 | 0.9 | 0.4 | 0.9 | 0.9 |
| Malaysia | 208 | 4 | 70 | 1.0 | 1.2 | 0.7 | 1.0 | 1.4 |
| Malta | 22 | 1 | 45 | 1.2 | 1.3 | 0.7 | 1.3 | 1.4 |
| Mauritania | 7 | 0 | 5 | 2.1 | 2.6 | 1.3 | 2.0 | 2.6 |
| Mauritius | 13 | 0 | 26 | 1.3 | 1.5 | 0.8 | 1.1 | 1.4 |
| Mexico | 49 | 3 | 46 | 0.9 | 1.1 | 0.6 | 1.0 | 1.3 |
| Montenegro | 3 | 0 | 7 | 0.4 | 0.4 | 0.2 | 0.4 | 0.4 |
| Myanmar | 12 | 0 | 11 | 2.0 | 2.0 | 1.1 | 2.0 | 2.0 |
| Namibia | 6 | 0 | 18 | 1.3 | 1.3 | 0.6 | 1.2 | 1.2 |
| Netherlands | 137 | 3 | 87 | 0.9 | 1.3 | 1.1 | 1.8 | 2.0 |
| New Zealand | 32 | 0 | 33 | 1.1 | 1.6 | 1.0 | 1.2 | 1.5 |
| Nicaragua | 6 | 0 | 8 | 1.1 | 1.2 | 0.7 | 1.2 | 1.2 |
| Nigeria | 23 | 0 | 30 | 2.9 | 3.4 | 2.7 | 2.9 | 3.4 |
| Norway | 30 | 0 | 14 | 0.3 | 0.5 | 0.3 | 0.3 | 0.4 |
| Oman | 30 | 3 | 40 | 0.8 | 0.9 | 0.4 | 0.9 | 1.0 |
| Panama | 65 | 4 | 56 | 0.9 | 1.1 | 0.7 | 1.0 | 1.2 |
| Papua New Guinea | 19 | 0 | 18 | 1.5 | 1.9 | 1.1 | 1.6 | 1.8 |
| Paraguay | 3 | 0 | 2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Peru | 25 | 0 | 31 | 0.8 | 0.9 | 0.5 | 0.9 | 0.9 |
| Philippines | 66 | 0 | 15 | 1.0 | 1.3 | 0.8 | 1.1 | 1.3 |
| Poland | 29 | 2 | 33 | 0.9 | 1.4 | 0.7 | 2.1 | 2.4 |
| Portugal | 50 | 1 | 48 | 0.8 | 1.1 | 0.7 | 1.0 | 1.4 |
| Qatar | 17 | 1 | 25 | 0.6 | 0.7 | 0.5 | 0.7 | 0.8 |
| Romania | 13 | 1 | 20 | 1.5 | 2.5 | 1.6 | 2.1 | 2.4 |
| Russian Federation | 45 | 0 | 34 | 1.8 | 2.2 | 1.5 | 1.9 | 2.3 |
| Saudi Arabia | 63 | 3 | 49 | 0.8 | 1.1 | 0.6 | 0.9 | 1.1 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of services** | **Number of alliances** | **Number of international connections** | **Turnaround time at port (days)** | | **Interquartile range** | **Weighted by ship’s twenty-foot**  **equivalent unit capacity** | |
| **Economy** | **Median** | **Mean** | **Median** | **Mean** |
| Singapore | 240 | 5 | 81 | 1.0 | 1.2 | 0.6 | 1.2 | 1.3 |
| Slovenia | 14 | 2 | 19 | 0.9 | 1.3 | 0.7 | 2.4 | 2.2 |
| Solomon Islands | 7 | 0 | 18 | 1.6 | 1.8 | 1.4 | 1.6 | 1.9 |
| Somalia | 9 | 0 | 14 | 1.0 | 1.2 | 1.3 | 1.0 | 1.3 |
| South Africa | 26 | 0 | 37 | 2.8 | 3.3 | 2.6 | 3.0 | 3.5 |
| Spain | 144 | 4 | 90 | 0.7 | 1.0 | 0.7 | 1.1 | 1.4 |
| Sri Lanka | 67 | 3 | 50 | 1.0 | 1.3 | 0.6 | 1.0 | 1.3 |
| Sudan | 4 | 0 | 1 | 6.6 | 6.2 | 3.4 | 6.9 | 6.6 |
| Sweden | 30 | 1 | 25 | 0.8 | 1.0 | 0.7 | 1.1 | 1.3 |
| Syrian Arab Republic | 5 | 0 | 12 | 0.9 | 1.2 | 0.8 | 0.9 | 1.3 |
| Taiwan, China | 141 | 3 | 61 | 0.5 | 0.8 | 0.5 | 0.8 | 1.0 |
| Thailand | 89 | 3 | 33 | 0.8 | 1.0 | 0.8 | 1.1 | 1.4 |
| Togo | 25 | 0 | 30 | 1.1 | 1.4 | 0.5 | 1.2 | 1.4 |
| Trinidad and Tobago | 16 | 0 | 27 | 0.8 | 0.9 | 0.5 | 0.8 | 1.0 |
| Türkiye | 109 | 3 | 50 | 0.7 | 1.0 | 0.6 | 1.0 | 1.2 |
| Ukraine | N/A | N/A | 0 | 0.9 | 1.2 | 0.8 | 1.2 | 1.3 |
| United Arab Emirates | 85 | 3 | 55 | 1.1 | 1.6 | 1.0 | 1.2 | 1.6 |
| United Kingdom | 133 | 3 | 90 | 0.9 | 1.2 | 0.9 | 1.3 | 1.8 |
| United States | 223 | 5 | 102 | 1.5 | 2.1 | 1.4 | 1.9 | 2.7 |
| Uruguay | 19 | 0 | 23 | 0.9 | 1.2 | 0.8 | 1.0 | 1.1 |
| Venezuela, RB | 6 | 0 | 7 | 1.6 | 2.0 | 1.3 | 1.8 | 2.2 |
| Vietnam | 180 | 3 | 34 | 0.8 | 0.9 | 0.5 | 0.9 | 1.0 |
| Yemen, Rep. | 9 | 0 | 8 | 2.8 | 3.6 | 2.1 | 3.1 | 3.7 |

*Source:* World Bank calculations based on data from MDS Transmodal and MarineTraffic.

*Note:* Data on the number of international connections are for the second quarter of 2022, and data on turnaround time at ports are for June 2022.

**Lead time data for aviation, second quarter of 2022**

Table A**2.2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Average number of partners (incoming and outgoing)** | **Aviation import dwell time (time from advisory to the consignee of the freight’s arrival to delivery)**  **(days)** | | |
| **Economy** | **Median** | **Mean** | **Interquartile range** |
| Algeria | 52.5 | 10.3 | 9.9 | 12.9 |
| Angola | 59.5 | 10.0 | 9.6 | 11.8 |
| Argentina | 84.5 | 1.4 | 1.4 | 2.6 |
| Armenia | 53 | 2.6 | 4.0 | 5.2 |
| Australia | 98.5 | 1.3 | 0.8 | 2.0 |
| Austria | 122 | 0.9 | 0.7 | 1.7 |
| Bahamas, The | 15 | 4.8 | 2.4 | 6.7 |
| Bahrain | 71 | 1.5 | 1.9 | 3.0 |
| Bangladesh | 73 | 4.9 | 3.8 | 8.0 |
| Belgium | 141 | 0.9 | 0.9 | 1.5 |
| Benin | 35 | 4.6 | 4.7 | 5.2 |
| Brazil | 116.5 | 2.6 | 1.7 | 3.6 |
| Bulgaria | 83.5 | 1.1 | 1.3 | 2.3 |
| Cambodia | 56.5 | 3.1 | 3.5 | 5.2 |
| Cameroon | 54.5 | 3.7 | 2.9 | 4.1 |
| Canada | 147 | 1.8 | 1.3 | 2.2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Average number of partners (incoming and outgoing)** | **Aviation import dwell time (time from advisory to the consignee of the freight’s arrival to delivery)**  **(days)** | | |
| **Economy** | **Median** | **Mean** | **Interquartile range** |
| Chile | 63.5 | 2.0 | 1.5 | 4.6 |
| China | 127 | 3.4 | 2.5 | 4.7 |
| Colombia | 80 | 2.0 | 1.7 | 2.8 |
| Congo, Dem. Rep. | 42 | 1.7 | 1.8 | 3.9 |
| Congo, Rep. | 32 | 3.3 | 3.0 | 4.7 |
| Costa Rica | 55 | 1.8 | 1.7 | 2.9 |
| Croatia | 68.5 | 2.2 | 2.6 | 3.0 |
| Cuba | 31.5 | 8.3 | 1.4 | 10.4 |
| Cyprus | 89 | 1.8 | 1.3 | 2.5 |
| Czechia | 115.5 | 1.8 | 1.8 | 2.3 |
| Denmark | 123 | 1.3 | 1.8 | 2.2 |
| Djibouti | 24 | 5.0 | 4.9 | 12.0 |
| Dominican Republic | 53 | 2.7 | 2.8 | 5.1 |
| Egypt, Arab Rep. | 107.5 | 8.3 | 8.7 | 11.0 |
| El Salvador | 21 | 1.6 | 1.6 | 2.2 |
| Estonia | 69.5 | 1.8 | 1.7 | 3.0 |
| Finland | 104 | 1.2 | 1.7 | 2.1 |
| France | 149.5 | 2.1 | 1.3 | 2.8 |
| Gabon | 32 | 12.7 | 8.2 | 74.3 |
| Georgia | 67.5 | 2.7 | 2.9 | 3.2 |
| Germany | 149.5 | 2.8 | 1.5 | 3.3 |
| Ghana | 80.5 | 4.7 | 5.5 | 6.1 |
| Greece | 111.5 | 1.9 | 2.2 | 2.8 |
| Guatemala | 32.5 | 0.8 | 1.5 | 3.6 |
| Guinea | 41 | 0.0 | 0.0 | 6.9 |
| Honduras | 16.5 | 2.5 | 1.8 | 10.6 |
| Hong Kong SAR, China | 135.5 | 1.6 | 0.7 | 2.0 |
| Hungary | 101 | 1.0 | 1.1 | 1.6 |
| Iceland | 10.5 | 1.9 | 1.7 | 2.1 |
| India | 133 | 3.0 | 1.9 | 3.8 |
| Indonesia | 104 | 2.6 | 2.4 | 3.7 |
| Iran, Islamic Rep. | 77 | 3.9 | 2.9 | 6.1 |
| Iraq | 68.5 | 2.1 | 2.6 | 2.5 |
| Ireland | 114.5 | 1.3 | 1.6 | 2.2 |
| Israel | 100.5 | 2.7 | 3.2 | 4.3 |
| Italy | 144.5 | 3.0 | 2.6 | 4.0 |
| Jamaica | 27.5 | 4.8 | 4.9 | 7.9 |
| Japan | 135 | 2.6 | 1.8 | 3.4 |
| Kazakhstan | 53 | 5.0 | 2.8 | 8.5 |
| Korea, Rep. | 129 | 1.4 | 1.0 | 2.1 |
| Kuwait | 94 | 2.8 | 2.7 | 4.8 |
| Latvia | 64.5 | 3.0 | 2.1 | 3.9 |
| Lithuania | 75.5 | 2.9 | 2.4 | 2.4 |
| Luxembourg | 68 | 0.8 | 0.8 | 1.5 |
| Madagascar | 52 | 2.1 | 2.6 | 2.3 |
| Malaysia | 111 | 1.1 | 0.8 | 2.1 |
| Mali | 50.5 | 2.7 | 3.0 | 4.1 |
| Malta | 66 | 1.8 | 2.0 | 3.1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Average number of partners (incoming and outgoing)** | **Aviation import dwell time (time from advisory to the consignee of the freight’s arrival to delivery)**  **(days)** | | |
| **Economy** | **Median** | **Mean** | **Interquartile range** |
| Mauritius | 63 | 2.0 | 2.2 | 3.8 |
| Mexico | 100.5 | 1.9 | 1.9 | 3.3 |
| Myanmar | 49 | 0.9 | 0.4 | 1.4 |
| Netherlands | 145 | 1.6 | 0.8 | 3.1 |
| New Zealand | 74.5 | 0.8 | 1.0 | 1.3 |
| Nigeria | 93.5 | 4.7 | 5.2 | 7.8 |
| Norway | 108 | 1.2 | 1.6 | 2.3 |
| Oman | 82.5 | 2.2 | 2.5 | 3.7 |
| Panama | 55 | 1.9 | 2.3 | 2.9 |
| Peru | 56 | 3.6 | 2.6 | 10.9 |
| Philippines | 92.5 | 2.9 | 2.4 | 5.8 |
| Poland | 104 | 2.1 | 2.5 | 2.7 |
| Portugal | 110.5 | 1.9 | 2.1 | 3.0 |
| Romania | 91.5 | 1.8 | 1.9 | 2.2 |
| Russian Federation | 85 | 2.7 | 2.5 | 3.5 |
| Rwanda | 31.5 | 2.6 | 1.4 | 3.7 |
| Saudi Arabia | 99.5 | 3.4 | 2.6 | 5.4 |
| Singapore | 124.5 | 1.6 | 0.3 | 2.5 |
| Slovenia | 73 | 1.9 | 2.1 | 3.1 |
| South Africa | 132 | 1.9 | 1.3 | 3.1 |
| Spaina | 136.5 | 2.1 | 1.8 | 2.9 |
| Sri Lanka | 76 | 2.5 | 3.0 | 4.6 |
| Sudan | 62 | 7.9 | 5.4 | 5.9 |
| Sweden | 116.5 | 1.7 | 2.0 | 2.6 |
| Switzerland | 142.5 | 1.6 | 1.0 | 2.2 |
| Taiwan, China | 104 | 1.3 | 1.3 | 2.3 |
| Thailand | 120 | 2.1 | 2.1 | 3.1 |
| Togo | 33.5 | 4.0 | 3.8 | 5.0 |
| Trinidad and Tobago | 23 | 4.7 | 4.0 | 8.7 |
| Türkiye | 119 | 3.5 | 3.0 | 4.1 |
| United Arab Emirates | 136 | 2.5 | 1.3 | 3.4 |
| United Kingdom | 152.5 | 2.0 | 1.0 | 3.0 |
| United States | 158 | 4.1 | 1.2 | 5.2 |
| Uruguay | 39.5 | 5.1 | 0.1 | 9.0 |
| Vietnam | 98 | 2.6 | 2.4 | 3.5 |
| Zimbabwe | 45.5 | 4.5 | 4.6 | 4.9 |

*Source:* Cargo IQ.

a. Includes the Canary Islands.

**Lead time data for postal parcels, 2019**

Table A**2.3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Average number of partners (countries)** |  | **Delivery time (days)** |  |
| **Economy** | **Median** | **Mean** | **Interquartile range** |
| Afghanistan | 42.5 | 9.7 | 5.2 | 11.1 |
| Albania | 80.5 | 1.7 | 0.9 | 1.1 |
| Algeria | 87 | 6.7 | 5.0 | 5.1 |
| Angola | 53.5 | 13.0 | 4.9 | 16.7 |
| Argentina | 80.5 | 27.0 | 21.1 | 34.8 |
| Armenia | 62 | 6.3 | 4.2 | 5.0 |
| Australia | 147 | 3.7 | 2.9 | 3.0 |
| Austria | 138 | 3.8 | 1.8 | 3.4 |
| Bahamas, The | 25.5 | 2.2 | 0.0 | 0.0 |
| Bahrain | 75 | 7.9 | 6.7 | 7.8 |
| Bangladesh | 97 | 6.9 | 5.2 | 4.0 |
| Belarus | 105 | 4.1 | 2.8 | 4.0 |
| Belgium | 107.5 | 5.6 | 2.8 | 5.9 |
| Benin | 59.5 | 3.5 | 0.2 | 2.0 |
| Bhutan | 25 | 5.5 | 2.2 | 8.0 |
| Bosnia and Herzegovina | 76 | 4.6 | 3.1 | 3.8 |
| Botswana | 33.5 | 15.9 | 12.1 | 14.9 |
| Brazil | 128.5 | 23.2 | 19.2 | 17.9 |
| Bulgaria | 107 | 8.0 | 2.1 | 10.2 |
| Burkina Faso | 71 | 3.3 | 0.1 | 4.1 |
| Cambodia | 57.5 | 4.0 | 0.3 | 4.0 |
| Cameroon | 63 | 10.6 | 6.0 | 11.0 |
| Canada | 150 | 4.8 | 3.2 | 4.9 |
| Chile | 103 | 8.7 | 4.6 | 7.7 |
| China | 121.5 | 5.6 | 4.1 | 3.9 |
| Colombia | 91 | 2.4 | 0.8 | 2.0 |
| Congo, Dem. Rep. | 45 | 61.2 | 31.1 | 109.1 |
| Congo, Rep. | 32 | 16.4 | 10.0 | 21.1 |
| Costa Rica | 75 | 10.1 | 6.2 | 14.9 |
| Croatia | 106.5 | 2.0 | 1.1 | 2.0 |
| Cuba | 73 | 19.4 | 16.2 | 17.2 |
| Cyprus | 108 | 2.1 | 1.2 | 2.4 |
| Czechia | 128.5 | 4.1 | 2.3 | 3.9 |
| Denmark | 138 | 4.7 | 2.1 | 5.6 |
| Djibouti | 39 | 3.4 | 1.0 | 3.7 |
| Dominican Republic | 65 | 2.0 | 0.2 | 0.2 |
| Egypt, Arab Rep. | 89 | 10.2 | 2.1 | 13.1 |
| El Salvador | 34 | 4.1 | 2.1 | 3.7 |
| Estonia | 113 | 4.5 | 2.0 | 5.3 |
| Fiji | 59.5 | 3.8 | 1.3 | 2.4 |
| Finland | 134 | 2.5 | 1.3 | 2.1 |
| France | 141 | 3.0 | 2.2 | 1.3 |
| Gabon | 22 | 11.9 | 5.0 | 16.1 |
| Georgia | 82 | 1.8 | 1.0 | 1.1 |
| Germany | 150.5 | 1.7 | 0.9 | 1.6 |
| Ghana | 90.5 | 2.4 | 1.0 | 2.7 |
| Greece | 131.5 | 4.8 | 3.0 | 5.0 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Average number of partners (countries)** |  | **Delivery time (days)** |  |
| **Economy** | **Median** | **Mean** | **Interquartile range** |
| Guatemala | 25 | 28.7 | 18.9 | 31.0 |
| Guinea | 32 | 6.7 | 2.9 | 7.0 |
| Guyana | 31.5 | 5.0 | 0.8 | 8.1 |
| Haiti | 22 | 11.2 | 4.9 | 15.3 |
| Honduras | 32 | 8.5 | 5.1 | 9.1 |
| Hong Kong SAR, China | 134 | 1.8 | 1.2 | 1.3 |
| Hungary | 116.5 | 2.5 | 1.5 | 1.9 |
| Iceland | 110.5 | 2.7 | 1.3 | 2.7 |
| India | 140 | 10.4 | 7.9 | 8.1 |
| Indonesia | 117 | 13.3 | 7.2 | 11.1 |
| Iran, Islamic Rep. | 98 | 4.4 | 3.0 | 3.9 |
| Iraq | 64.5 | 14.6 | 7.9 | 15.9 |
| Ireland | 103 | 1.6 | 0.9 | 1.4 |
| Israel | 99 | 7.1 | 5.9 | 7.0 |
| Italy | 142.5 | 4.5 | 2.1 | 4.0 |
| Jamaica | 80 | 17.9 | 9.9 | 12.2 |
| Japan | 140 | 2.5 | 1.8 | 1.5 |
| Kazakhstan | 101 | 8.1 | 5.9 | 6.8 |
| Korea, Rep. | 120.5 | 1.8 | 1.0 | 2.0 |
| Kuwait | 82.5 | 6.9 | 3.3 | 9.2 |
| Kyrgyz Republic | 49.5 | 6.0 | 3.2 | 7.3 |
| Lao PDR | 50 | 4.4 | 2.0 | 4.1 |
| Latvia | 108.5 | 1.8 | 1.6 | 1.9 |
| Liberia | 32.5 | 2.7 | 0.0 | 0.2 |
| Libya | 42.5 | 15.2 | 1.1 | 10.1 |
| Lithuania | 119 | 5.6 | 2.2 | 5.8 |
| Luxembourg | 104 | 2.5 | 1.2 | 2.1 |
| Madagascar | 36.5 | 3.9 | 0.9 | 6.8 |
| Malaysia | 123 | 5.2 | 2.9 | 4.5 |
| Mali | 43.5 | 1.3 | 0.1 | 1.2 |
| Malta | 105 | 5.1 | 1.7 | 6.0 |
| Mauritania | 30 | 4.8 | 1.0 | 3.8 |
| Mauritius | 79.5 | 7.6 | 4.9 | 8.1 |
| Mexico | 87.5 | 12.5 | 7.6 | 10.9 |
| Moldova | 87 | 2.7 | 2.0 | 2.9 |
| Mongolia | 62 | 2.6 | 0.9 | 2.8 |
| Montenegro | 56 | 4.7 | 2.1 | 5.3 |
| Myanmar | 46 | 1.8 | 1.0 | 1.8 |
| Namibia | 46 | 16.0 | 11.8 | 17.6 |
| Netherlands | 148.5 | 1.5 | 0.9 | 0.7 |
| New Zealand | 128.5 | 2.9 | 1.8 | 2.3 |
| Nicaragua | 43.5 | 7.3 | 5.0 | 7.3 |
| Nigeria | 102.5 | 6.4 | 3.2 | 10.7 |
| North Macedonia | 72.5 | 6.8 | 4.1 | 7.8 |
| Norway | 139.5 | 4.9 | 3.9 | 5.5 |
| Oman | 90 | 5.6 | 2.3 | 6.0 |
| Panama | 68 | 7.7 | 2.7 | 5.8 |
| Papua New Guinea | 27 | 8.4 | 5.0 | 8.8 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Average number of partners (countries)** |  | **Delivery time (days)** |  |
| **Economy** | **Median** | **Mean** | **Interquartile range** |
| Paraguay | 59.5 | 27.6 | 18.0 | 39.9 |
| Peru | 97 | 11.7 | 7.3 | 10.0 |
| Philippines | 116 | 18.9 | 13.7 | 22.2 |
| Poland | 136.5 | 3.0 | 1.9 | 2.1 |
| Portugal | 113 | 13.2 | 6.8 | 20.7 |
| Qatar | 99.5 | 5.9 | 3.1 | 5.9 |
| Romania | 122 | 2.3 | 1.1 | 2.1 |
| Russian Federation | 144.5 | 7.9 | 5.8 | 6.6 |
| Rwanda | 61.5 | 5.5 | 3.0 | 4.7 |
| Saudi Arabia | 116 | 6.6 | 4.1 | 6.2 |
| Serbia | 104 | 9.3 | 7.7 | 9.9 |
| Singapore | 116 | 1.9 | 1.1 | 1.5 |
| Slovak Republic | 110 | 2.2 | 1.3 | 2.0 |
| Slovenia | 106.5 | 3.6 | 1.9 | 4.1 |
| Solomon Islands | 25.5 | 7.8 | 1.0 | 9.8 |
| South Africa | 130 | 15.9 | 11.0 | 13.6 |
| Spain | 142 | 5.8 | 3.0 | 5.0 |
| Sri Lanka | 87.5 | 19.0 | 12.2 | 27.0 |
| Sudan | 42 | 5.0 | 1.9 | 5.4 |
| Sweden | 137 | 2.8 | 1.9 | 3.1 |
| Switzerland | 145.5 | 3.0 | 1.9 | 3.1 |
| Syrian Arab Republic | 44.5 | 9.6 | 7.0 | 13.0 |
| Taiwan, China | 103 | 2.9 | 2.1 | 2.8 |
| Tajikistan | 29 | 0.0 | 0.0 | 0.0 |
| Thailand | 121 | 2.6 | 2.1 | 2.0 |
| Togo | 67.5 | 8.0 | 3.0 | 6.2 |
| Trinidad and Tobago | 50.5 | 18.8 | 14.2 | 14.1 |
| Türkiye | 133.5 | 9.6 | 5.4 | 9.9 |
| Ukraine | 129.5 | 5.0 | 3.9 | 3.6 |
| United Arab Emirates | 131.5 | 5.5 | 1.1 | 1.5 |
| United Kingdom | 139.5 | 2.4 | 1.0 | 2.5 |
| United States | 149.5 | 5.1 | 3.9 | 3.8 |
| Uruguay | 85.5 | 9.9 | 4.7 | 12.9 |
| Uzbekistan | 33.5 | 5.5 | 4.0 | 3.3 |
| Venezuela, RB | 37 | 37.7 | 21.1 | 47.6 |
| Vietnam | 103.5 | 8.2 | 5.0 | 8.9 |
| Zimbabwe | 58 | 15.2 | 8.9 | 16.5 |

*Source:* Universal Postal Union.

**Import delays, May–October 2022**

Table **A2.4**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of observations** |  | **Consolidated dwell time (days)** | |  |  |  | **Port dwell time (days)** | |  |
| **Economy** | **Mean** | **Median** | **Q25** | **Q75** |  | **Mean** | **Median** | **Q25** | **Q75** |
| Albania | 1,039 | 13.6 | 6.6 | 3.7 | 14.7 |  | 13.3 | 6.4 | 3.5 | 14.5 |
| Algeria | 2,362 | 20.9 | 16.4 | 10.9 | 24.6 |  | 20.9 | 16.4 | 10.9 | 24.6 |
| American Samoa | 20 | 18.4 | 17.0 | 4.9 | 32.6 |  | 18.4 | 17.0 | 4.9 | 32.6 |
| Angola | 10,064 | 6.9 | 4.8 | 2.9 | 8.1 |  | 4.4 | 4.0 | 2.4 | 5.5 |
| Argentina | 14,350 | 11.4 | 9.2 | 6.4 | 13.6 |  | 11.4 | 9.2 | 6.4 | 13.6 |
| Armenia | 12 | 3.8 | 3.3 | 2.7 | 5.1 |  | 3.3 | 3.3 | 0.7 | 5.1 |
| Aruba | 927 | 3.3 | 2.0 | 1.0 | 5.0 |  | 3.3 | 2.0 | 1.0 | 5.0 |
| Australia | 53,319 | 3.2 | 3.0 | 2.1 | 4.0 |  | 3.2 | 3.0 | 2.1 | 3.9 |
| Austria | 227 | 18.0 | 13.6 | 9.1 | 22.9 |  | 14.1 | 11.0 | 6.0 | 18.9 |
| Azerbaijan | 48 | 5.2 | 4.3 | 3.5 | 5.1 |  | 4.0 | 3.6 | 0.5 | 5.0 |
| Bahamas, The | 25 | 4.7 | 3.2 | 2.1 | 5.5 |  | 4.7 | 3.2 | 2.1 | 5.5 |
| Bahrain | 45 | 6.3 | 5.5 | 2.7 | 9.1 |  | 6.0 | 4.6 | 2.6 | 9.1 |
| Bangladesh | 14,145 | 8.1 | 5.5 | 3.5 | 9.4 |  | 7.7 | 5.4 | 3.5 | 9.0 |
| Barbados | 12 | 8.7 | 6.6 | 5.1 | 10.8 |  | 0.5 | 0.5 | 0.5 | 0.6 |
| Belgium | 24,991 | 10.4 | 6.6 | 4.0 | 12.8 |  | 8.3 | 5.8 | 3.7 | 10.1 |
| Belize | 1 | 0.1 | 0.1 | 0.1 | 0.1 |  | 0.1 | 0.1 | 0.1 | 0.1 |
| Benin | 5,791 | 12.4 | 8.7 | 5.2 | 15.0 |  | 12.4 | 8.7 | 5.2 | 15.0 |
| Bolivia | 273 | 6.0 | 3.9 | 1.4 | 9.0 |  | 6.0 | 3.9 | 1.4 | 9.0 |
| Bonaire, Sint Eustatius and Saba | 18 | 4.0 | 2.2 | 1.6 | 5.7 |  | 3.8 | 1.9 | 1.5 | 5.6 |
| Bosnia and Herzegovina | 24 | 12.9 | 12.4 | 8.7 | 17.5 |  | 12.9 | 12.4 | 8.7 | 17.5 |
| Botswana | 69 | 13.4 | 9.0 | 4.4 | 18.8 |  | 9.9 | 6.1 | 3.8 | 9.2 |
| Brazil | 44,205 | 6.7 | 4.4 | 1.9 | 8.6 |  | 6.6 | 4.4 | 1.9 | 8.5 |
| Brunei Darussalam | 2,149 | 2.8 | 2.3 | 1.1 | 4.3 |  | 2.8 | 2.3 | 1.1 | 4.3 |
| Bulgaria | 3,022 | 8.6 | 6.1 | 3.5 | 8.9 |  | 8.6 | 6.1 | 3.5 | 8.9 |
| Burkina Faso | 131 | 21.4 | 19.4 | 12.3 | 28.5 |  | 13.6 | 12.7 | 6.9 | 17.2 |
| Burundi | 12 | 15.1 | 15.8 | 9.7 | 18.4 |  | 11.9 | 9.7 | 8.6 | 16.5 |
| Cabo Verde | 696 | 7.9 | 4.7 | 2.7 | 10.7 |  | 7.7 | 4.7 | 2.7 | 9.7 |
| Cambodia | 7,951 | 3.6 | 2.1 | 1.0 | 4.1 |  | 3.6 | 2.1 | 1.0 | 4.1 |
| Cameroon | 6,102 | 16.4 | 11.9 | 7.3 | 20.2 |  | 16.3 | 11.9 | 7.3 | 20.1 |
| Canada | 20,359 | 8.8 | 5.8 | 3.2 | 10.9 |  | 6.1 | 4.2 | 1.7 | 7.4 |
| Cayman Islands | 27 | 6.6 | 4.9 | 1.9 | 9.9 |  | 0.8 | 0.8 | 0.5 | 1.0 |
| Central African Republic | 8 | 31.3 | 30.2 | 26.1 | 34.0 |  | 31.3 | 30.2 | 26.1 | 34.0 |
| Chad | 20 | 15.2 | 15.5 | 7.5 | 18.4 |  | 15.2 | 15.5 | 7.5 | 18.4 |
| Chile | 20,991 | 4.1 | 3.2 | 1.9 | 4.5 |  | 4.1 | 3.2 | 1.9 | 4.5 |
| China | 87,910 | 5.5 | 3.7 | 1.9 | 6.6 |  | 5.5 | 3.7 | 1.9 | 6.6 |
| Colombia | 21,401 | 8.8 | 7.2 | 5.1 | 10.2 |  | 8.8 | 7.2 | 5.1 | 10.2 |
| Congo, Dem. Rep. | 6,198 | 18.1 | 14.7 | 9.9 | 22.1 |  | 17.5 | 14.6 | 9.9 | 22.0 |
| Congo, Rep. | 3,436 | 9.6 | 6.6 | 3.8 | 11.9 |  | 9.3 | 6.2 | 3.7 | 11.7 |
| Costa Rica | 9,353 | 7.6 | 6.1 | 3.1 | 9.4 |  | 5.4 | 3.4 | 1.9 | 6.6 |
| Côte d’Ivoire | 7,004 | 10.8 | 7.9 | 4.6 | 13.3 |  | 10.7 | 7.9 | 4.4 | 13.3 |
| Croatia | 3,879 | 7.1 | 4.4 | 2.9 | 8.6 |  | 6.6 | 4.3 | 2.8 | 7.9 |
| Cuba | 24 | 13.2 | 13.2 | 5.8 | 19.5 |  | 13.2 | 13.2 | 5.8 | 19.5 |
| Curaçao | 640 | 7.3 | 7.0 | 3.2 | 10.4 |  | 7.3 | 7.0 | 3.2 | 10.4 |
| Cyprus | 2,557 | 3.3 | 1.8 | 1.0 | 4.4 |  | 3.3 | 1.8 | 1.0 | 4.4 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of observations** |  | **Consolidated dwell time (days)** | |  |  |  | **Port dwell time (days)** | |  |
| **Economy** | **Mean** | **Median** | **Q25** | **Q75** |  | **Mean** | **Median** | **Q25** | **Q75** |
| Czechia | 4,891 | 17.6 | 15.9 | 10.7 | 22.1 |  | 11.4 | 9.9 | 6.2 | 14.6 |
| Denmark | 13,462 | 8.4 | 5.9 | 2.5 | 9.3 |  | 6.9 | 5.4 | 2.3 | 7.8 |
| Djibouti | 7,030 | 9.0 | 6.0 | 3.4 | 10.4 |  | 8.9 | 5.9 | 3.4 | 10.4 |
| Dominican Republic | 5,772 | 7.7 | 5.5 | 3.2 | 9.5 |  | 7.5 | 5.4 | 3.1 | 9.3 |
| Ecuador | 9,234 | 7.3 | 5.8 | 3.5 | 9.1 |  | 7.3 | 5.8 | 3.5 | 9.0 |
| Egypt, Arab Rep. | 17,735 | 16.9 | 12.2 | 6.0 | 21.7 |  | 14.4 | 9.4 | 4.9 | 18.3 |
| El Salvador | 6,850 | 7.2 | 5.5 | 3.6 | 9.0 |  | 7.2 | 5.4 | 3.6 | 9.0 |
| Equatorial Guinea | 804 | 6.7 | 4.5 | 1.1 | 10.0 |  | 6.7 | 4.5 | 1.1 | 10.0 |
| Estonia | 411 | 4.7 | 4.0 | 1.8 | 5.9 |  | 4.7 | 4.0 | 1.8 | 5.9 |
| Eswatini | 121 | 4.4 | 4.0 | 3.0 | 4.4 |  | 4.1 | 3.9 | 3.0 | 4.4 |
| Ethiopia | 147 | 11.0 | 4.6 | 3.4 | 9.9 |  | 10.9 | 4.6 | 3.4 | 9.5 |
| Faroe Islands | 15 | 1.4 | 0.5 | 0.2 | 1.8 |  | 0.8 | 0.4 | 0.2 | 0.8 |
| Fiji | 850 | 2.9 | 2.4 | 1.7 | 3.6 |  | 2.9 | 2.4 | 1.7 | 3.6 |
| Finland | 3,137 | 12.5 | 6.8 | 3.4 | 14.7 |  | 12.5 | 6.8 | 3.4 | 14.7 |
| France | 18,617 | 8.1 | 5.7 | 3.5 | 9.8 |  | 7.9 | 5.6 | 3.5 | 9.5 |
| Gabon | 934 | 11.4 | 8.8 | 5.8 | 13.9 |  | 11.4 | 8.8 | 5.8 | 13.9 |
| Gambia, The | 2,644 | 9.7 | 6.7 | 3.9 | 10.7 |  | 9.7 | 6.7 | 3.9 | 10.7 |
| Georgia | 4,717 | 4.6 | 2.5 | 1.1 | 5.1 |  | 3.6 | 1.6 | 0.5 | 3.7 |
| Germany | 51,995 | 12.1 | 8.6 | 5.1 | 15.3 |  | 10.2 | 7.6 | 4.7 | 12.8 |
| Ghana | 18,882 | 7.4 | 4.6 | 2.0 | 9.4 |  | 5.7 | 3.0 | 1.1 | 7.5 |
| Greece | 8,585 | 5.2 | 3.2 | 1.9 | 5.5 |  | 5.2 | 3.2 | 1.9 | 5.4 |
| Grenada | 16 | 8.9 | 8.0 | 5.8 | 12.0 |  | 0.9 | 0.6 | 0.6 | 1.0 |
| Guadeloupe | 2,147 | 5.1 | 3.3 | 1.4 | 6.4 |  | 5.1 | 3.3 | 1.4 | 6.4 |
| Guatemala | 8,759 | 8.4 | 6.8 | 4.1 | 10.9 |  | 8.4 | 6.8 | 4.1 | 10.9 |
| Guinea | 7,892 | 8.8 | 6.2 | 4.0 | 10.8 |  | 8.8 | 6.2 | 4.0 | 10.8 |
| Guyana | 871 | 11.5 | 8.7 | 4.1 | 16.8 |  | 11.4 | 8.7 | 4.0 | 16.8 |
| Haiti | 610 | 13.4 | 10.7 | 5.8 | 16.1 |  | 13.4 | 10.7 | 5.8 | 16.1 |
| Honduras | 6,688 | 6.9 | 5.5 | 2.6 | 9.3 |  | 6.7 | 5.4 | 2.4 | 8.9 |
| Hong Kong SAR, China | 13,300 | 3.1 | 2.4 | 0.9 | 4.1 |  | 3.0 | 2.3 | 0.9 | 4.1 |
| Hungary | 3,747 | 14.7 | 12.3 | 6.5 | 20.1 |  | 9.9 | 7.9 | 4.6 | 13.5 |
| India | 71,765 | 5.3 | 2.7 | 1.2 | 7.5 |  | 2.6 | 1.5 | 0.9 | 3.0 |
| Indonesia | 41,619 | 3.4 | 2.3 | 1.2 | 4.2 |  | 3.2 | 2.2 | 1.2 | 4.0 |
| Iraq | 1,760 | 7.0 | 5.1 | 3.6 | 7.8 |  | 7.0 | 5.1 | 3.6 | 7.8 |
| Ireland | 4,678 | 9.0 | 5.7 | 3.7 | 10.3 |  | 8.9 | 5.7 | 3.7 | 10.2 |
| Israel | 13,890 | 6.8 | 4.6 | 2.8 | 7.5 |  | 5.8 | 4.1 | 2.5 | 6.3 |
| Italy | 23,629 | 9.0 | 6.2 | 3.7 | 11.0 |  | 8.0 | 5.9 | 3.3 | 9.8 |
| Jamaica | 1,536 | 9.2 | 7.9 | 4.7 | 12.0 |  | 9.2 | 7.9 | 4.7 | 12.0 |
| Japan | 35,216 | 7.4 | 5.5 | 3.3 | 8.9 |  | 1.0 | 0.4 | 0.3 | 0.6 |
| Jordan | 6,741 | 5.5 | 3.3 | 1.6 | 6.9 |  | 5.5 | 3.3 | 1.6 | 6.9 |
| Kenya | 21,764 | 6.9 | 5.0 | 2.9 | 8.8 |  | 5.1 | 3.4 | 1.9 | 6.5 |
| Korea, Rep. | 35,154 | 8.5 | 5.7 | 2.6 | 10.5 |  | 8.2 | 5.6 | 2.6 | 10.4 |
| Kuwait | 7,772 | 6.0 | 4.6 | 3.1 | 6.9 |  | 6.0 | 4.6 | 3.1 | 6.9 |
| Lao PDR | 5 | 6.8 | 2.9 | 2.8 | 3.3 |  | 5.0 | 0.6 | 0.3 | 1.1 |
| Latvia | 1,365 | 8.0 | 5.5 | 3.3 | 10.2 |  | 8.0 | 5.5 | 3.3 | 10.2 |
| Lebanon | 3,195 | 12.2 | 9.9 | 6.4 | 14.5 |  | 12.2 | 9.9 | 6.4 | 14.5 |
| Lesotho | 183 | 5.9 | 5.1 | 3.5 | 6.2 |  | 5.0 | 4.9 | 3.4 | 6.0 |
| Liberia | 4,175 | 9.2 | 6.2 | 3.1 | 12.1 |  | 9.2 | 6.2 | 3.1 | 12.1 |
| Libya | 3,109 | 13.8 | 10.2 | 7.3 | 15.8 |  | 13.8 | 10.2 | 7.3 | 15.8 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of observations** |  | **Consolidated dwell time (days)** | |  |  |  | **Port dwell time (days)** | |  |
| **Economy** | **Mean** | **Median** | **Q25** | **Q75** |  | **Mean** | **Median** | **Q25** | **Q75** |
| Lithuania | 3,059 | 8.5 | 5.4 | 2.4 | 9.3 |  | 8.4 | 5.4 | 2.4 | 9.2 |
| Luxembourg | 5 | 15.2 | 16.5 | 12.3 | 17.3 |  | 15.2 | 16.5 | 12.3 | 17.3 |
| Madagascar | 4,421 | 6.3 | 4.7 | 1.8 | 7.9 |  | 6.3 | 4.7 | 1.8 | 7.9 |
| Malawi | 115 | 12.7 | 11.7 | 7.0 | 16.3 |  | 10.6 | 9.9 | 6.3 | 14.2 |
| Malaysia | 39,582 | 5.8 | 3.6 | 1.8 | 6.6 |  | 5.8 | 3.6 | 1.8 | 6.6 |
| Maldives | 176 | 1.5 | 0.1 | 0.1 | 2.1 |  | 1.5 | 0.1 | 0.1 | 2.1 |
| Mali | 128 | 22.7 | 11.2 | 8.8 | 23.9 |  | 19.7 | 10.3 | 8.1 | 16.5 |
| Malta | 91 | 25.0 | 20.0 | 7.1 | 39.3 |  | 25.0 | 20.0 | 7.1 | 39.3 |
| Martinique | 1,509 | 5.4 | 5.0 | 2.0 | 6.3 |  | 5.4 | 5.0 | 2.0 | 6.3 |
| Mauritania | 3,327 | 10.7 | 7.1 | 4.6 | 13.0 |  | 10.7 | 7.1 | 4.6 | 13.0 |
| Mauritius | 8,315 | 4.3 | 3.2 | 2.0 | 5.0 |  | 4.3 | 3.2 | 2.0 | 5.0 |
| Mexico | 41,736 | 8.8 | 6.2 | 3.6 | 10.2 |  | 8.6 | 6.0 | 3.5 | 9.9 |
| Moldova | 4 | 10.4 | 10.5 | 10.0 | 10.9 |  | 10.4 | 10.5 | 10.0 | 10.9 |
| Mongolia | 2 | 25.1 | 25.1 | 20.0 | 30.3 |  | 25.0 | 25.0 | 19.9 | 30.1 |
| Morocco | 16,266 | 10.7 | 7.2 | 4.2 | 12.4 |  | 10.2 | 7.1 | 4.1 | 12.2 |
| Mozambique | 5,713 | 7.5 | 5.6 | 3.6 | 9.3 |  | 7.4 | 5.6 | 3.6 | 9.2 |
| Myanmar | 13,635 | 8.1 | 5.0 | 3.1 | 9.6 |  | 8.1 | 5.0 | 3.1 | 9.6 |
| Namibia | 1,097 | 9.1 | 6.8 | 4.1 | 10.4 |  | 9.1 | 6.8 | 4.1 | 10.4 |
| Nepal | 2,454 | 11.6 | 10.6 | 6.0 | 15.5 |  | 6.1 | 3.7 | 2.0 | 8.8 |
| Netherlands | 72,974 | 9.4 | 5.8 | 3.1 | 11.2 |  | 7.2 | 5.2 | 3.0 | 9.1 |
| New Zealand | 24,995 | 6.5 | 4.7 | 2.7 | 9.3 |  | 5.4 | 3.9 | 2.2 | 7.2 |
| Nicaragua | 4,077 | 6.8 | 5.2 | 3.4 | 8.2 |  | 6.8 | 5.2 | 3.4 | 8.2 |
| Niger | 33 | 16.6 | 15.3 | 7.5 | 24.0 |  | 16.6 | 15.3 | 7.5 | 24.0 |
| Nigeria | 26,953 | 16.2 | 12.5 | 7.5 | 20.2 |  | 15.2 | 11.6 | 7.0 | 19.1 |
| North Macedonia | 14 | 13.0 | 9.0 | 4.9 | 12.2 |  | 12.8 | 9.0 | 4.9 | 12.2 |
| Norway | 4,314 | 5.0 | 3.6 | 1.1 | 6.1 |  | 4.8 | 3.5 | 1.1 | 6.0 |
| Oman | 8,864 | 5.0 | 3.2 | 1.6 | 6.3 |  | 5.0 | 3.1 | 1.6 | 6.3 |
| Pakistan | 10,834 | 10.0 | 6.8 | 3.7 | 11.8 |  | 6.4 | 3.7 | 1.8 | 7.9 |
| Panama | 17,467 | 6.0 | 4.5 | 2.9 | 7.1 |  | 5.0 | 3.9 | 2.4 | 6.1 |
| Papua New Guinea | 965 | 6.8 | 5.2 | 3.2 | 7.5 |  | 6.8 | 5.2 | 3.2 | 7.5 |
| Paraguay | 739 | 7.6 | 6.4 | 3.9 | 10.0 |  | 7.5 | 6.3 | 3.8 | 10.0 |
| Peru | 15,294 | 2.5 | 1.8 | 1.2 | 2.7 |  | 2.5 | 1.8 | 1.2 | 2.7 |
| Philippines | 43,236 | 6.4 | 5.0 | 3.0 | 8.0 |  | 6.2 | 4.9 | 2.8 | 8.0 |
| Poland | 35,325 | 11.2 | 7.5 | 4.4 | 13.4 |  | 10.3 | 6.4 | 4.1 | 11.8 |
| Portugal | 7,805 | 7.7 | 5.0 | 2.8 | 9.8 |  | 6.9 | 4.8 | 2.7 | 8.7 |
| Puerto Rico | 2,377 | 5.8 | 5.0 | 3.2 | 7.1 |  | 5.8 | 5.0 | 3.2 | 7.1 |
| Qatar | 8,626 | 4.4 | 3.0 | 1.3 | 5.1 |  | 4.3 | 3.0 | 1.3 | 5.1 |
| Réunion | 4,786 | 6.3 | 5.2 | 2.3 | 7.5 |  | 6.3 | 5.2 | 2.3 | 7.5 |
| Romania | 7,409 | 10.3 | 6.6 | 4.6 | 11.8 |  | 9.6 | 6.4 | 4.5 | 11.2 |
| Rwanda | 67 | 16.5 | 13.6 | 8.5 | 17.6 |  | 14.6 | 11.9 | 4.7 | 15.3 |
| Samoa | 5 | 6.0 | 4.2 | 4.2 | 5.2 |  | 6.0 | 4.2 | 4.2 | 5.2 |
| Saudi Arabia | 25,767 | 4.3 | 3.1 | 1.9 | 4.4 |  | 2.1 | 0.7 | 0.5 | 2.9 |
| Senegal | 15,548 | 8.1 | 6.4 | 3.0 | 9.6 |  | 8.0 | 6.4 | 3.0 | 9.6 |
| Serbia | 299 | 10.5 | 8.0 | 5.0 | 13.6 |  | 7.6 | 5.1 | 3.1 | 9.6 |
| Seychelles | 926 | 11.7 | 9.0 | 5.0 | 15.2 |  | 11.6 | 9.0 | 5.0 | 15.1 |
| Sierra Leone | 3,961 | 9.2 | 6.2 | 3.3 | 11.2 |  | 9.2 | 6.2 | 3.3 | 11.2 |
| Singapore | 13,621 | 3.0 | 1.5 | 0.8 | 2.6 |  | 3.0 | 1.5 | 0.8 | 2.6 |
| Sint Maarten (Dutch part) | 20 | 8.9 | 6.7 | 5.0 | 12.5 |  | 0.8 | 0.6 | 0.6 | 0.9 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of observations** |  | **Consolidated dwell time (days)** | |  |  |  | **Port dwell time (days)** | |  |
| **Economy** | **Mean** | **Median** | **Q25** | **Q75** |  | **Mean** | **Median** | **Q25** | **Q75** |
| Slovak Republic | 2,981 | 19.2 | 16.5 | 10.2 | 25.7 |  | 10.8 | 9.9 | 5.9 | 14.3 |
| Slovenia | 8,125 | 8.0 | 5.5 | 3.2 | 10.0 |  | 7.5 | 5.3 | 3.2 | 9.3 |
| Solomon Islands | 98 | 12.5 | 9.3 | 3.3 | 19.2 |  | 11.9 | 9.0 | 3.2 | 19.0 |
| Somalia | 3,767 | 7.3 | 5.0 | 3.0 | 9.0 |  | 7.3 | 5.0 | 3.0 | 9.0 |
| South Africa | 41,097 | 5.3 | 3.7 | 2.5 | 5.5 |  | 4.0 | 3.5 | 2.3 | 4.9 |
| Spain | 39,144 | 8.5 | 5.9 | 3.2 | 10.9 |  | 7.7 | 5.5 | 2.9 | 9.7 |
| Sri Lanka | 7,197 | 5.7 | 3.6 | 2.0 | 5.9 |  | 5.7 | 3.6 | 2.0 | 5.9 |
| St. Kitts and Nevis | 5 | 5.0 | 3.9 | 3.4 | 4.0 |  | 0.5 | 0.4 | 0.4 | 0.4 |
| St. Lucia | 1 | 9.5 | 9.5 | 9.5 | 9.5 |  | 0.5 | 0.5 | 0.5 | 0.5 |
| St. Vincent and the Grenadines | 8 | 4.3 | 3.6 | 2.4 | 5.6 |  | 0.8 | 0.6 | 0.5 | 1.0 |
| Sudan | 3,540 | 12.8 | 6.7 | 5.5 | 16.0 |  | 12.8 | 6.7 | 5.5 | 16.0 |
| Suriname | 729 | 5.3 | 3.8 | 2.0 | 6.8 |  | 5.3 | 3.8 | 2.0 | 6.8 |
| Sweden | 12,472 | 7.6 | 5.0 | 3.3 | 9.1 |  | 6.6 | 4.5 | 3.1 | 8.2 |
| Switzerland | 330 | 19.8 | 17.7 | 12.4 | 25.1 |  | 12.8 | 10.0 | 6.4 | 16.7 |
| Syrian Arab Republic | 160 | 15.5 | 12.1 | 7.5 | 18.1 |  | 15.5 | 12.1 | 7.5 | 18.1 |
| Taiwan, China | 11,273 | 6.8 | 5.2 | 3.1 | 8.8 |  | 5.2 | 3.9 | 1.8 | 6.8 |
| Tanzania | 11,265 | 13.9 | 9.4 | 4.4 | 17.8 |  | 10.3 | 5.1 | 2.8 | 12.6 |
| Thailand | 31,034 | 5.7 | 4.3 | 2.6 | 7.1 |  | 4.4 | 3.3 | 1.7 | 5.4 |
| Timor-Leste | 80 | 4.6 | 4.1 | 1.7 | 5.2 |  | 4.0 | 3.8 | 1.5 | 5.2 |
| Togo | 7,118 | 8.1 | 4.6 | 3.0 | 9.0 |  | 8.1 | 4.6 | 3.0 | 9.0 |
| Tonga | 5 | 4.4 | 3.0 | 3.0 | 6.1 |  | 4.4 | 3.0 | 3.0 | 6.1 |
| Trinidad and Tobago | 2,277 | 9.2 | 6.7 | 4.4 | 10.2 |  | 9.1 | 6.7 | 4.4 | 10.2 |
| Tunisia | 1,496 | 18.7 | 13.4 | 9.0 | 23.3 |  | 18.7 | 13.4 | 9.0 | 23.3 |
| Türkiye | 25,836 | 8.6 | 5.7 | 3.7 | 10.2 |  | 8.6 | 5.7 | 3.6 | 10.1 |
| Turks and Caicos Islands | 47 | 19.2 | 18.6 | 11.0 | 25.9 |  | 0.8 | 0.6 | 0.5 | 1.0 |
| Uganda | 535 | 18.2 | 14.7 | 9.5 | 24.1 |  | 9.3 | 8.1 | 4.9 | 11.5 |
| United Arab Emirates | 47,865 | 4.5 | 3.0 | 1.5 | 5.9 |  | 4.4 | 3.0 | 1.5 | 5.9 |
| United Kingdom | 78,224 | 8.5 | 5.5 | 3.3 | 9.3 |  | 7.2 | 5.0 | 2.9 | 8.4 |
| United States | 350,868 | 8.3 | 5.4 | 3.2 | 9.2 |  | 7.2 | 5.1 | 3.0 | 8.3 |
| Uruguay | 4,819 | 2.4 | 1.8 | 1.2 | 2.8 |  | 2.4 | 1.8 | 1.2 | 2.8 |
| Venezuela, RB | 3,861 | 5.1 | 3.6 | 2.4 | 6.7 |  | 5.1 | 3.6 | 2.4 | 6.7 |
| Vietnam | 50,207 | 5.4 | 3.6 | 1.8 | 7.1 |  | 5.3 | 3.6 | 1.8 | 7.0 |
| Virgin Islands (U.S.) | 7 | 5.7 | 4.0 | 1.1 | 8.9 |  | 0.9 | 0.9 | 0.5 | 1.0 |
| Yemen, Rep. | 2,366 | 4.8 | 4.1 | 3.1 | 6.2 |  | 4.8 | 4.1 | 3.1 | 6.2 |
| Zambia | 171 | 13.9 | 11.7 | 7.8 | 16.8 |  | 13.6 | 11.4 | 7.3 | 16.8 |
| Zimbabwe | 176 | 12.8 | 11.8 | 8.1 | 15.2 |  | 12.8 | 11.8 | 8.1 | 15.2 |

*Source:* TradeLens.

**Export delays, May–October 2022**

Table **A2.5**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of observations** |  | **Consolidated dwell time (days)** | |  |  |  | **Port dwell time (days)** | |  |
| **Economy** | **Mean** | **Median** | **Q25** | **Q75** |  | **Mean** | **Median** | **Q25** | **Q75** |
| Albania | 82 | 6.9 | 5.4 | 3.5 | 9.1 |  | 6.9 | 5.4 | 3.5 | 9.1 |
| Algeria | 418 | 3.4 | 0.7 | 0.4 | 1.9 |  | 3.4 | 0.7 | 0.4 | 1.9 |
| Angola | 24 | 10.9 | 7.0 | 3.9 | 15.4 |  | 10.9 | 7.0 | 3.9 | 15.4 |
| Argentina | 8,804 | 7.4 | 6.7 | 4.7 | 9.1 |  | 7.4 | 6.7 | 4.7 | 9.1 |
| Aruba | 9 | 6.6 | 6.3 | 2.2 | 8.5 |  | 6.6 | 6.3 | 2.2 | 8.5 |
| Australia | 16,744 | 5.3 | 4.6 | 3.5 | 6.2 |  | 5.3 | 4.6 | 3.5 | 6.2 |
| Austria | 164 | 13.4 | 10.6 | 7.2 | 16.4 |  | 9.3 | 6.9 | 4.0 | 10.7 |
| Bahamas, The | 25 | 10.5 | 9.4 | 3.7 | 11.9 |  | 10.5 | 9.4 | 3.7 | 11.9 |
| Bahrain | 335 | 4.8 | 3.8 | 2.8 | 6.3 |  | 4.8 | 3.8 | 2.8 | 6.3 |
| Bangladesh | 17,272 | 1.7 | 1.0 | 0.5 | 2.0 |  | 1.6 | 0.9 | 0.5 | 1.8 |
| Belgium | 26,348 | 7.7 | 6.3 | 4.0 | 9.6 |  | 7.3 | 6.0 | 3.9 | 9.0 |
| Benin | 491 | 16.2 | 13.8 | 9.8 | 20.2 |  | 16.2 | 13.8 | 9.8 | 20.2 |
| Brazil | 44,165 | 9.6 | 7.7 | 5.4 | 11.8 |  | 9.5 | 7.7 | 5.4 | 11.7 |
| Brunei Darussalam | 45 | 1.5 | 0.9 | 0.6 | 2.2 |  | 1.5 | 0.9 | 0.6 | 2.2 |
| Bulgaria | 1,508 | 8.4 | 7.7 | 5.9 | 10.1 |  | 8.0 | 7.3 | 5.7 | 9.7 |
| Burkina Faso | 3 | 14.2 | 15.3 | 8.6 | 20.4 |  | 12.9 | 13.3 | 6.6 | 19.4 |
| Cabo Verde | 80 | 18.2 | 14.3 | 6.4 | 25.5 |  | 18.2 | 14.3 | 6.4 | 25.5 |
| Cambodia | 10,461 | 2.4 | 1.4 | 1.0 | 3.0 |  | 2.4 | 1.4 | 1.0 | 3.0 |
| Cameroon | 1,301 | 6.7 | 5.4 | 3.6 | 8.2 |  | 6.7 | 5.4 | 3.6 | 8.2 |
| Canada | 7,550 | 5.7 | 5.1 | 2.3 | 7.3 |  | 4.8 | 4.7 | 0.0 | 6.8 |
| Chile | 13,309 | 4.7 | 4.2 | 2.9 | 5.8 |  | 4.7 | 4.2 | 2.9 | 5.8 |
| China | 790,942 | 5.2 | 4.5 | 3.1 | 6.4 |  | 4.9 | 4.3 | 2.9 | 6.2 |
| Colombia | 7,529 | 6.3 | 5.0 | 3.2 | 7.8 |  | 6.2 | 5.0 | 3.1 | 7.7 |
| Congo, Dem. Rep. | 34 | 21.4 | 13.2 | 8.2 | 22.8 |  | 19.6 | 12.4 | 7.5 | 21.9 |
| Congo, Rep. | 269 | 8.5 | 7.6 | 6.1 | 9.9 |  | 8.5 | 7.5 | 5.9 | 9.8 |
| Costa Rica | 6,046 | 2.8 | 2.1 | 1.3 | 3.5 |  | 2.6 | 1.9 | 1.3 | 3.2 |
| Côte d’Ivoire | 2,643 | 6.4 | 5.7 | 4.0 | 7.6 |  | 6.2 | 5.6 | 3.9 | 7.4 |
| Croatia | 799 | 8.8 | 8.5 | 6.2 | 10.7 |  | 8.8 | 8.5 | 6.2 | 10.7 |
| Cuba | 3 | 8.9 | 8.7 | 6.9 | 10.8 |  | 8.9 | 8.7 | 6.9 | 10.8 |
| Curaçao | 8 | 14.0 | 12.8 | 6.5 | 21.2 |  | 14.0 | 12.8 | 6.5 | 21.2 |
| Cyprus | 832 | 1.8 | 1.4 | 1.1 | 2.1 |  | 1.8 | 1.4 | 1.1 | 2.1 |
| Czechia | 3,222 | 13.8 | 12.5 | 9.5 | 16.9 |  | 7.6 | 6.7 | 4.2 | 9.7 |
| Denmark | 12,644 | 8.1 | 7.5 | 4.8 | 9.7 |  | 8.1 | 7.5 | 4.7 | 9.6 |
| Djibouti | 2,434 | 5.3 | 4.5 | 2.3 | 6.6 |  | 5.3 | 4.4 | 2.3 | 6.6 |
| Dominican Republic | 1,326 | 9.4 | 8.1 | 4.8 | 11.8 |  | 9.3 | 8.0 | 4.8 | 11.7 |
| Ecuador | 8,951 | 3.7 | 3.1 | 2.3 | 4.5 |  | 3.6 | 3.1 | 2.3 | 4.4 |
| Egypt, Arab Rep. | 18,712 | 5.6 | 4.9 | 3.4 | 6.7 |  | 5.5 | 4.8 | 3.4 | 6.6 |
| El Salvador | 544 | 10.0 | 8.6 | 5.9 | 13.2 |  | 10.0 | 8.6 | 5.9 | 13.2 |
| Equatorial Guinea | 73 | 12.9 | 11.0 | 6.4 | 14.8 |  | 12.9 | 11.0 | 6.4 | 14.8 |
| Estonia | 49 | 6.2 | 5.3 | 4.3 | 8.3 |  | 5.7 | 5.3 | 4.3 | 8.3 |
| Ethiopia | 18 | 11.6 | 14.0 | 9.2 | 15.3 |  | 6.4 | 4.7 | 3.4 | 7.9 |
| Fiji | 151 | 3.6 | 3.2 | 2.5 | 4.6 |  | 3.6 | 3.2 | 2.5 | 4.6 |
| Finland | 6,240 | 9.4 | 8.1 | 6.2 | 11.1 |  | 9.4 | 8.1 | 6.2 | 11.1 |
| France | 14,417 | 9.5 | 8.0 | 4.9 | 12.4 |  | 9.2 | 7.7 | 4.6 | 12.0 |
| Gabon | 442 | 6.4 | 6.1 | 4.1 | [Q?] |  | 9.2 | 7.7 | 4.6 | 12.0 |
| Gambia, The | 442 | 6.4 | 6.1 | 4.1 | 8.2 |  | 6.4 | 6.1 | 4.1 | 8.2 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of observations** |  | **Consolidated dwell time (days)** | |  |  |  | **Port dwell time (days)** | |  |
| **Economy** | **Mean** | **Median** | **Q25** | **Q75** |  | **Mean** | **Median** | **Q25** | **Q75** |
| Georgia | 365 | 7.9 | 3.9 | 2.7 | 11.2 |  | 7.7 | 3.9 | 2.7 | 10.8 |
| Germany | 529 | 4.9 | 1.6 | 0.74.2 | 10.5 |  | 7.7 | 6.0 | 3.9 | 9.4 |
| Ghana | 1,411 | 5.3 | 4.1 | 3.0 | 5.8 |  | 4.9 | 3.8 | 2.7 | 5.4 |
| Greece | 4,624 | 4.6 | 3.8 | 2.8 | 5.2 |  | 4.6 | 3.8 | 2.8 | 5.2 |
| Guadeloupe | 101 | 6.8 | 4.6 | 3.1 | 9.4 |  | 6.8 | 4.6 | 3.1 | 9.4 |
| Guatemala | 5,328 | 4.2 | 3.3 | 1.9 | 5.6 |  | 4.2 | 3.3 | 1.9 | 5.6 |
| Guinea | 314 | 9.4 | 8.7 | 5.5 | 12.3 |  | 9.4 | 8.7 | 5.5 | 12.3 |
| Guyana | 250 | 8.6 | 7.3 | 3.6 | 11.6 |  | 8.6 | 7.3 | 3.6 | 11.6 |
| Haiti | 47 | 11.5 | 10.0 | 3.0 | 15.2 |  | 11.5 | 10.0 | 3.0 | 15.2 |
| Honduras | 4,268 | 2.8 | 2.0 | 1.6 | 3.1 |  | 2.7 | 2.0 | 1.6 | 3.1 |
| Hong Kong SAR, China | 5,794 | 5.0 | 4.8 | 3.4 | 6.3 |  | 5.0 | 4.8 | 3.4 | 6.3 |
| Hungary | 1,746 | 13.5 | 11.5 | 8.3 | 16.2 |  | 8.8 | 7.6 | 4.7 | 10.3 |
| India | 129,906 | 5.0 | 4.3 | 3.0 | 6.4 |  | 4.6 | 4.1 | 2.9 | 5.9 |
| Indonesia | 46,046 | 3.5 | 3.3 | 2.2 | 4.6 |  | 3.5 | 3.3 | 2.2 | 4.6 |
| Iraq | 4 | 6.2 | 6.1 | 4.8 | 7.5 |  | 6.2 | 6.1 | 4.8 | 7.5 |
| Ireland | 3,263 | 7.6 | 6.7 | 4.9 | 9.4 |  | 7.6 | 6.7 | 4.9 | 9.3 |
| Israel | 7,059 | 3.3 | 2.5 | 1.9 | 3.4 |  | 3.2 | 2.5 | 1.9 | 3.4 |
| Italy | 36,798 | 7.4 | 6.2 | 4.4 | 9.1 |  | 7.0 | 6.0 | 4.1 | 8.5 |
| Jamaica | 22 | 12.8 | 9.9 | 5.2 | 15.7 |  | 12.8 | 9.9 | 5.2 | 15.7 |
| Japan | 21,019 | 5.2 | 4.5 | 2.4 | 7.1 |  | 1.0 | 0.4 | 0.3 | 0.6 |
| Jordan | 2,287 | 5.3 | 4.8 | 3.6 | 6.6 |  | 5.3 | 4.8 | 3.6 | 6.6 |
| Kenya | 7,039 | 5.8 | 5.3 | 2.9 | 7.5 |  | 5.8 | 5.3 | 2.9 | 7.4 |
| Korea, Rep. | 40,400 | 3.7 | 2.8 | 2.1 | 3.8 |  | 3.6 | 2.8 | 2.0 | 3.8 |
| Kuwait | 1,329 | 4.9 | 4.5 | 3.0 | 6.5 |  | 4.9 | 4.5 | 3.0 | 6.5 |
| Latvia | 2,342 | 9.3 | 8.3 | 5.3 | 11.8 |  | 9.3 | 8.3 | 5.3 | 11.8 |
| Lebanon | 2,386 | 5.5 | 4.4 | 2.9 | 6.6 |  | 5.5 | 4.4 | 2.9 | 6.6 |
| Liberia | 243 | 9.5 | 8.1 | 5.7 | 10.9 |  | 9.4 | 8.0 | 5.7 | 10.9 |
| Libya | 28 | 12.7 | 7.5 | 4.5 | 14.9 |  | 12.7 | 7.5 | 4.5 | 14.9 |
| Lithuania | 1,903 | 9.2 | 8.3 | 5.7 | 11.9 |  | 9.1 | 8.3 | 5.6 | 11.8 |
| Madagascar | 1,698 | 2.8 | 2.1 | 1.4 | 3.0 |  | 2.8 | 2.1 | 1.4 | 3.0 |
| Malaysia | 32,484 | 4.4 | 3.6 | 2.4 | 5.5 |  | 4.4 | 3.6 | 2.4 | 5.5 |
| Maldives | 6 | 1.5 | 1.2 | 1.2 | 1.3 |  | 1.5 | 1.2 | 1.2 | 1.3 |
| Mali | 14 | 15.0 | 14.0 | 10.8 | 16.8 |  | 3.6 | 4.0 | 2.8 | 4.4 |
| Malta | 59 | 8.2 | 6.3 | 3.8 | 9.3 |  | 8.2 | 6.3 | 3.8 | 9.3 |
| Martinique | 139 | 12.9 | 10.4 | 4.4 | 18.6 |  | 12.9 | 10.4 | 4.4 | 18.6 |
| Mauritania | 388 | 15.0 | 12.8 | 8.1 | 19.8 |  | 14.9 | 12.7 | 8.0 | 19.8 |
| Mauritius | 1,615 | 3.9 | 3.3 | 2.4 | 4.7 |  | 3.9 | 3.3 | 2.4 | 4.7 |
| Mexico | 13,672 | 10.4 | 8.8 | 5.8 | 13.1 |  | 10.2 | 8.7 | 5.7 | 12.9 |
| Morocco | 4,222 | 6.4 | 5.8 | 3.9 | 8.1 |  | 6.4 | 5.7 | 3.9 | 8.1 |
| Mozambique | 345 | 8.5 | 7.3 | 5.8 | 11.0 |  | 8.4 | 7.3 | 5.7 | 11.0 |
| Myanmar | 9,036 | 5.6 | 5.1 | 3.6 | 7.0 |  | 5.6 | 5.1 | 3.6 | 7.0 |
| Namibia | 1,044 | 6.8 | 5.9 | 4.6 | 7.7 |  | 6.2 | 5.7 | 4.4 | 7.5 |
| Nepal | 5 | 11.5 | 9.3 | 9.2 | 15.7 |  | 6.9 | 7.1 | 4.5 | 9.1 |
| Netherlands | 35,175 | 6.5 | 5.1 | 3.7 | 7.0 |  | 5.6 | 4.7 | 3.4 | 6.3 |
| New Zealand | 27,086 | 9.1 | 8.0 | 5.3 | 11.4 |  | 8.9 | 7.8 | 5.1 | 11.2 |
| Nicaragua | 1,285 | 5.0 | 4.0 | 2.4 | 6.4 |  | 5.0 | 4.0 | 2.4 | 6.3 |
| Nigeria | 1,128 | 13.6 | 11.2 | 7.7 | 17.4 |  | 13.1 | 11.0 | 7.3 | 16.8 |
| Norway | 3,161 | 6.9 | 5.4 | 3.5 | 8.8 |  | 6.9 | 5.4 | 3.5 | 8.8 |
| Oman | 4,111 | 5.1 | 4.6 | 2.9 | 6.9 |  | 5.1 | 4.6 | 2.9 | 6.9 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Number of observations** |  | **Consolidated dwell time (days)** | |  |  |  | **Port dwell time (days)** | |  |
| **Economy** | **Mean** | **Median** | **Q25** | **Q75** |  | **Mean** | **Median** | **Q25** | **Q75** |
| Pakistan | 17,594 | 5.8 | 5.1 | 3.4 | 7.3 |  | 5.7 | 5.0 | 3.3 | 7.0 |
| Panama | 4,088 | 7.4 | 5.7 | 3.6 | 9.2 |  | 7.3 | 5.6 | 3.5 | 9.1 |
| Papua New Guinea | 587 | 3.3 | 2.8 | 2.1 | 4.4 |  | 3.3 | 2.8 | 2.1 | 4.4 |
| Paraguay | 441 | 10.9 | 9.5 | 6.6 | 12.5 |  | 10.9 | 9.5 | 6.6 | 12.5 |
| Peru | 12,902 | 3.9 | 3.1 | 2.2 | 4.8 |  | 3.7 | 2.9 | 2.1 | 4.5 |
| Philippines | 13,153 | 4.7 | 3.3 | 2.1 | 5.9 |  | 4.6 | 3.2 | 2.1 | 5.9 |
| Poland | 17,139 | 8.1 | 6.9 | 5.3 | 9.7 |  | 7.4 | 6.6 | 5.0 | 8.7 |
| Portugal | 4,750 | 5.8 | 5.3 | 4.0 | 6.8 |  | 5.6 | 5.3 | 4.0 | 6.7 |
| Puerto Rico | 497 | 7.3 | 6.0 | 4.0 | 9.4 |  | 7.2 | 5.9 | 4.0 | 9.3 |
| Qatar | 2,104 | 1.9 | 1.1 | 0.6 | 2.1 |  | 1.9 | 1.1 | 0.6 | 2.1 |
| Réunion | 154 | 10.4 | 8.7 | 7.1 | 13.3 |  | 10.4 | 8.7 | 7.1 | 13.3 |
| Romania | 4,012 | 5.5 | 4.9 | 3.2 | 7.3 |  | 5.3 | 4.8 | 3.1 | 7.1 |
| Saudi Arabia | 19,317 | 5.2 | 4.5 | 3.1 | 6.4 |  | 3.1 | 2.1 | 0.6 | 4.4 |
| Senegal | 1,196 | 3.6 | 3.3 | 2.3 | 4.4 |  | 3.4 | 3.1 | 2.3 | 4.3 |
| Serbia | 4 | 16.9 | 17.7 | 15.2 | 19.4 |  | 13.3 | 13.2 | 12.0 | 14.5 |
| Seychelles | 468 | 7.9 | 3.0 | 1.8 | 9.1 |  | 7.7 | 3.0 | 1.3 | 9.0 |
| Sierra Leone | 138 | 8.6 | 7.2 | 4.9 | 11.0 |  | 8.6 | 7.2 | 4.9 | 11.0 |
| Singapore | 15,384 | 3.1 | 2.2 | 1.5 | 3.4 |  | 3.1 | 2.2 | 1.5 | 3.4 |
| Slovak Republic | 1,116 | 14.0 | 12.9 | 9.2 | 17.0 |  | 8.2 | 6.7 | 4.6 | 10.2 |
| Slovenia | 4,467 | 7.1 | 6.3 | 5.1 | 8.2 |  | 7.1 | 6.3 | 5.0 | 8.1 |
| Solomon Islands | 107 | 2.7 | 2.3 | 1.7 | 4.4 |  | 2.6 | 2.3 | 1.7 | 4.1 |
| Somalia | 31 | 9.0 | 7.5 | 6.3 | 10.4 |  | 9.0 | 7.5 | 6.3 | 10.4 |
| South Africa | 35,442 | 5.5 | 5.3 | 3.9 | 6.8 |  | 5.5 | 5.3 | 3.9 | 6.8 |
| Spain | 37,918 | 9.8 | 8.4 | 5.5 | 12.2 |  | 9.3 | 8.0 | 5.3 | 11.6 |
| Sri Lanka | 6,992 | 4.0 | 3.5 | 2.3 | 5.2 |  | 3.9 | 3.5 | 2.2 | 5.2 |
| Sudan | 363 | 10.8 | 7.1 | 5.5 | 13.2 |  | 10.8 | 7.1 | 5.5 | 13.2 |
| Suriname | 178 | 9.5 | 8.8 | 5.7 | 13.0 |  | 9.5 | 8.8 | 5.6 | 13.0 |
| Sweden | 7,074 | 7.7 | 6.2 | 4.7 | 9.9 |  | 7.4 | 6.1 | 4.4 | 9.0 |
| Switzerland | 130 | 16.5 | 12.6 | 8.7 | 19.8 |  | 6.3 | 5.7 | 4.0 | 7.1 |
| Syrian Arab Republic | 63 | 5.6 | 5.0 | 2.9 | 7.4 |  | 5.6 | 5.0 | 2.9 | 7.4 |
| Taiwan, China | 17,613 | 6.1 | 5.3 | 3.8 | 7.6 |  | 5.1 | 4.5 | 2.9 | 6.6 |
| Tanzania | 2,410 | 7.3 | 5.4 | 3.8 | 7.9 |  | 7.2 | 5.4 | 3.8 | 7.8 |
| Thailand | 48,034 | 5.8 | 5.1 | 3.5 | 7.4 |  | 5.1 | 4.5 | 3.0 | 6.5 |
| Togo | 279 | 17.8 | 15.6 | 11.7 | 21.5 |  | 17.8 | 15.3 | 11.7 | 21.0 |
| Trinidad and Tobago | 522 | 11.8 | 10.4 | 7.8 | 14.6 |  | 11.8 | 10.4 | 7.8 | 14.5 |
| Tunisia | 1,513 | 4.9 | 3.0 | 1.6 | 6.7 |  | 4.9 | 3.0 | 1.6 | 6.7 |
| Türkiye | 37,087 | 8.9 | 7.8 | 5.4 | 11.1 |  | 8.9 | 7.7 | 5.3 | 11.1 |
| Uganda | 2 | 15.0 | 15.0 | 14.1 | 15.9 |  | 9.2 | 9.2 | 6.9 | 11.5 |
| Ukraine | 27 | 17.5 | 10.3 | 6.5 | 19.5 |  | 6.2 | 5.9 | 3.7 | 8.0 |
| United Arab Emirates | 24,460 | 5.5 | 4.8 | 3.2 | 6.9 |  | 5.4 | 4.8 | 3.1 | 6.9 |
| United Kingdom | 22,041 | 10.3 | 8.7 | 6.2 | 12.7 |  | 9.8 | 8.3 | 5.8 | 12.1 |
| United States | 114,211 | 8.6 | 6.9 | 4.5 | 10.5 |  | 8.2 | 6.8 | 4.4 | 10.1 |
| Uruguay | 1,749 | 5.3 | 4.8 | 3.2 | 6.4 |  | 5.3 | 4.8 | 3.2 | 6.4 |
| Venezuela, RB | 781 | 13.9 | 12.5 | 8.5 | 16.4 |  | 13.8 | 12.5 | 8.5 | 16.2 |
| Vietnam | 83,093 | 4.7 | 4.1 | 2.5 | 6.3 |  | 4.0 | 3.2 | 1.9 | 5.4 |
| Yemen, Rep. | 73 | 6.8 | 6.5 | 4.5 | 7.7 |  | 2.9 | 0.0 | 0.0 | 5.2 |

*Source:* TradeLens.

**Dwell times for landlocked developing countries, 2022 (days)**

Table A**2.6**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Country** | **Port dwell time** | **Reference dwell time for transit countries** | **Inland and destination dwell time** | **Corridor dwell time** |
| Armenia | 3.3 | 3.6 | 0.4 | — |
| Azerbaijan | 4 | 3.6 | 1.2 | — |
| Bolivia | 6 | 4.1 | 0 | — |
| Bosnia and Herzegovina | 12.9 | 6.6 | 0 | — |
| Botswana | 9.9 | 4 | 3.6 | — |
| Burkina Faso | 13.6 | 10.7 | 7.8 | — |
| Burundi | 11.9 | 10.3 | 3.3 | — |
| Chad | 15.2 | 16.3 | 0 | — |
| Ethiopia | 10.9 | 8.9 | 0.2 | — |
| Lao People’s Dem. Rep. | 5 | 4.4 | 1.8 | — |
| Lesotho | 5 | 4 | 0.9 | — |
| Malawi | 10.6 | 7.4 | 2.1 | 6.5 |
| Mali | 19.7 | 8 | 3.1 | 9.9 |
| Moldova | 10.4 | 9.6 | 0 | — |
| Mongolia | 25 | 5.5 | 0.1 | — |
| Nepal | 6.1 | 2.6 | 5.5 | 9.2 |
| Niger | 16.6 | 12.4 | 0 | — |
| North Macedonia | 12.8 | 5.2 | 0.1 | — |
| Paraguay | 7.5 | 11.4 | 0 | — |
| Rwanda | 14.6 | 5.1 | 2 | — |
| Serbia | 7.6 | 5.2 | 3 | — |
| Uganda | 9.3 | 5.1 | 8.8 | 4.4 |
| Zambia | 13.6 | 4 | 0.2 | — |
| Zimbabwe | 12.8 | 4 | 0 | — |

— is not available.

*Source:* World Bank calculations based on data from TradeLens.

# Top and bottom scorers on the LPI, overall and by income group

**APPENDIX**

**3**

**Top 12 LPI scorers in 2023 and their top scorer status for 2018, 2016, 2014, and 2012**

Table A**3.1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Economy** | **Top 10 scorer in 2018** | **Top 10 scorer in 2016** | **Top 10 scorer in 2014** | **Top 10 scorer in 2012** |
| Austria | Yes | Yes | No | Yes |
| Belgium | Yes | Yes | Yes | Yes |
| Canada | No | No | Yes | No |
| Germany | Yes | Yes | Yes | Yes |
| Denmark | Yes | No | No | Yes |
| Finland | Yes | No | No | Yes |
| Hong Kong SAR, China | Yes | Yes | No | Yes |
| Netherlands | Yes | Yes | Yes | Yes |
| Singapore | Yes | Yes | Yes | Yes |
| Sweden | Yes | Yes | Yes | No |
| Switzerland | No | Yes | No | No |
| United Arab Emirates | Yes | No | No | No |

*Source:* World Bank.

*Note:* Because of tied scores, the top 10 scores were attained by 12 countries. Countries are listed in alphabetical order.

**Bottom 12 LPI scorers in 2023 and their top scorer status for 2018, 2016, 2014, and 2012**

Table A**3.2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Economy** | **Bottom 10 scorer**  **in 2018** | **Bottom 10 scorer**  **in 2016** | **Bottom 10 scorer**  **in 2014** | **Bottom 10 scorer**  **in 2012** |
| Afghanistan | Yes | No | Yes | No |
| Angola | Yes | No | No | No |
| Cambodia | No | No | No | No |
| Cameroon | No | No | No | No |
| Cuba | No | No | Yes | No |
| Gambia, The | No | na | No | No |
| Haiti | Yes | Yes | No | Yes |
| Libya | Yes | No | No | No |
| Somalia | No | Yes | Yes | na |
| Yemen, Rep. | No | na | Yes | No |

*Source:* World Bank.

*Note:* Countries are listed in alphabetical order. na is not applicable because an LPI score was not calculated for the economy in the year indicated.

**Top 11 upper-middle-income LPI scorers in 2023 and their top scorer status in 2018, 2016, 2014, and 2012**

Table A**3.3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Economy** | **Top 10 upper-middle- income scorer in 2018** | **Top 10 upper-middle- income scorer in 2016** | **Top 10 upper-middle- income scorer in 2014** | **Top 10 upper-middle- income scorer in 2012** |
| Bosnia and Herzegovina | No | No | No | Yes |
| Botswana | No | Yes | No | No |
| Brazil | Yes | Yes | Yes | Yes |
| Bulgaria | Yes | No | Yes | Yes |
| China | Yes | Yes | Yes | Yes |
| Malaysia | Yes | Yes | Yes | Yes |
| North Macedonia | No | No | No | No |
| Peru | No | Yes | No | No |
| South Africa | Yes | Yes | Yes | Yes |
| Thailand | Yes | Yes | Yes | Yes |
| Türkiye | Yes | Yes | Yes | Yes |

*Source:* World Bank.

*Note:* Because of tied scores, the top 10 scores were attained by 11 countries. Upper-middle-income status is based on country status in fiscal year 2022/23. Countries are listed in alphabetical order.

**Top 13 lower-middle-income LPI scorers in 2023 and their top scorer status in 2018, 2016, 2014, and 2012**

Table A**3.4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Economy** | **Top 10 lower-middle-**  **income scorer 2018** | **Top 10 lower-middle-**  **income scorer 2016** | **Top 10 lower-middle-**  **income scorer 2014** | **Top 10 lower-middle-**  **income scorer 2012** |
| Benin | Yes | No | No | Yes |
| Djibouti | No | No | No | No |
| Egypt, Arab Rep. | Yes | Yes | Yes | Yes |
| El Salvador | No | Yes | Yes | Yes |
| Honduras | No | No | No | No |
| India | Yes | Yes | Yes | Yes |
| Indonesia | Yes | Yes | Yes | Yes |
| Papua New Guinea | No | No | No | No |
| Philippines | Yes | Yes | Yes | Yes |
| Solomon Islands | No | No | No | No |
| Sri Lanka | No | na | No | Yes |
| Uzbekistan | No | No | No | No |
| Vietnam | Yes | Yes | Yes | Yes |

*Source:* World Bank.

*Note:* Because of tied scores, the top 10 scores were attained by 13 countries. Lower-middle-income status is based on country status in fiscal year 2022/23. Countries are listed in alphabetical order. na is not applicable because an LPI score was not calculated for the economy in the year indicated.

**Top 10 low-income LPI scorers in 2023 and their top scorer status in 2018, 2016, 2014, and 2012**

Table A**3.5**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Economy** | **Top 10 LI 2018** | **Top 10 LI 2016** | **Top 10 LI 2014** | **Top 10 LI 2012** |
| Central African Republic | No | na | Yes | Yes |
| Congo, Dem. Rep. | Yes | Yes | No | No |
| Guinea | No | Yes | Yes | Yes |
| Guinea-Bissau | Yes | Yes | Yes | Yes |
| Liberia | No | Yes | Yes | Yes |
| Mali | Yes | Yes | Yes | na |
| Rwanda | Yes | Yes | Yes | No |
| Sudan | Yes | Yes | No | No |
| Syrian Arab Republic | Yes | No | No | Yes |
| Togo | Yes | Yes | Yes | Yes |

*Source:* World Bank.

*Note:* Low-income status is based on country status in fiscal year 2022/23. Countries are listed in alphabetical order. na is not applicable because an LPI score was not calculated for the economy in the year indicated.

# Description of the new data sources for the LPI 2023

**APPENDIX**

**4**

This appendix introduces the data sources on shipment tracking data. To construct new sets of indicators for the 2023 Logistics Perfor- mance Index (LPI), the World Bank collabo- rated with several external data providers. The data comprise the following micro-logistics high-frequency datasets: deployment of liner shipping service from MDS Transmodal, air cargo tracking from Cargo iQ (supported by the International Air Transport Association), flow of international letters and parcels from the Universal Postal Union (UPU), granular high-frequency information on consignment activities (container data) from TradeLens, and worldwide container ship port calls from an Automatic Identification System (AIS) data provider (MarineTraffic). For the first time, LPI data were not collected entirely in-house. This appendix covers the origin of the data, the coun- try coverage, and the variables used for the pro- cessing of the key performance indicators.

**MDS Transmodal**

MDS Transmodal is an independent consul- tancy focusing on the international freight transport sector, including shipping, ports, road, rail, logistics, and distribution. It collects and aggregates several types of transport-related data and maintains databases related to freight transportation. A dataset of aggregates for country pairs and countries for January–June 2022 was derived from MDS Transmodal’s Containership Databank, which covers ship- ping schedules and volumes offered on liner shipping routes.

Indicators available as part of the partner- ship agreement with MDS Transmodal include

the number of services, number of operators, number of alliances, and average annual fre- quency of shipping service, as well as statistics (average, maximum, minimum) on the num- ber of deployed ships, ship sizes, and ship ages. Under MDS Transmodal’s definition, two economies (or ports) are connected if there is a shipping service between them. As shipping services operate in loops, not point to point like aviation, connections are counted irrespective of the actual port sequence.

**Cargo iQ**

The air cargo dataset was provided by Cargo iQ, a nonprofit interest group created in 1997 by the International Air Transport Association to develop a system of shipment planning and performance monitoring for air cargo based on definitions of common business processes and milestones.1 Cargo iQ is a pioneer in digitaliza- tion efforts in the air cargo industry, focusing on transparency, visibility, and quality improvement. Cargo iQ brings together more than 60 participants, including forwarders, air carriers, ground handling companies, road carriers, and airports, to define the standards for shared pro- cesses and planning to control and evaluate per- formance of cargo shipments. Cargo iQ collects more than 110 million data lines a year, 12 mil- lion of which are airport-to-airport shipments. These records, covering information for about 650 airports in 184 countries and accounting for 45 percent of global air freight volume, were used to construct the aviation pillar of the 2023 LPI. Cargo iQ’s event recording follows a simi-

lar Electronic Data Interchange (EDI) protocol

as the UPU, with a similar logical ordering of

1. See <https://www.cargoiq.org/value-proposition>.



Figure **A4.1 Cargo iQ milestones**

*DEP*

Shipment departure from origin/last departure point

*ARR*

Shipment arrival at transit/ destination

*RCF*

Cargo received in warehouse at transit/ destination

*NFD*

Notification of Readiness for delivery of cargo to consignee/ agent

*DLV*

Cargo delivered to consignee/ agent

*Source:* Cargo iQ.

supply chain events. A shipment, commonly identified through an electronic airway bill is tracked through the system from the point of departure of the flight with cargo (DEP in figure A4.1) through its arrival (ARR) and check-in to a warehouse at a destination airport (RCF), followed by the advisory to the con- signee of the freight’s arrival (NFD), and the consignee’s final collection of the freight from the carrier at the destination airport (DLV).

For all five milestones, it is the carriers’ re- sponsibility to enter the data in the system in a timely, consistent, and accurate manner. The time differences between the milestones provide information on the various aspects of the reli- ability and performance of individual carriers, freighters, and operators and (at the aggregate level) of airports and countries.

To avoid revealing commercially sensitive information for specific carriers, trade lanes

Figure **A4.2 Country coverage of Cargo iQ dataset, by World Bank region**

Percent of countries in the region 80

60

40

20

0

*Source:* World Bank calculations based on data from Cargo iQ.

with certain characteristics are excluded from the dataset. They are bilateral lanes representing more than 80 percent of total shipments to tar- get countries with three or fewer carriers; these excluded 46 countries from the final set of key performance indicators, resulting in 141 coun- tries in the 2023 LPI aviation pillar.

The data from Cargo iQ’s system are based on a pair of milestones: advisory to the con- signee of the freight’s arrival to the consignee’s final collection of the freight from the carrier at the destination airport. In other words, the time elapsed between the two events was com- puted for each electronic airway bill recorded in the system at a destination country given the validity of the time difference (meaning that both timestamps exist and the time difference between them is positive). The choice of this in- dicator was based on two considerations: best apparent quality of data and country coverage

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| East Asia | Europe & | Latin America & | Middle East | North | South | Sub-Saharan |
| & Pacific | Central Asia | Caribbean | & North Africa | America | Asia | Africa |

and interpretability. This indicator represents how fast air cargo shipments move at the desti- nation, which is the equivalent of import dwell time. Future editions of *Connecting to Compete* may consider additional delay indicators.

**The postal sequence of tracking messages**

*Source:* Universal Postal Union.

Table A**4.1**

Low-income countries have the lowest cov- erage: data are available for 25 percent of these countries. The East Asia and Pacific, South Asia, and Sub-Saharan Africa regions all have about 35–40 percent coverage (figure A4.2). Geo- graphical coverage is lower for Cargo iQ than for the UPU.

**Universal Postal Union**

Most cross-border e-commerce depends on postal parcel services provided by UPU mem- bers or global express operators (for example, DHL, FedEx, and UPS). UPU members han- dle two-thirds of letter-parcel deliveries (up to 2 kilograms) across borders.2 Therefore, informa- tion collected by UPU is a source of comprehen- sive data for more than 190 member countries and probably the best unified source of informa- tion on e-commerce trade.

UPU maintains technical standards and EDI message specifications used in the exchange of electronic information between postal serv- ices. To exchange information between mem- bers’ postal services, UPU maintains EDI data- bases with records on volumes, frequencies, key cross-border activities, and other tracking data of postal items. This information is available via the Express Mail Service Events messaging stan- dard, which is used to track parcels (packages up to 30 kilograms), letters (letter-post items and packages up to 2 kilograms), and express mail flows in the UPU network (table A4.1).

For an e-commerce item, after a consumer places an order, the shipper hands the item over to the origin post (event A in table A4.1). The post inducts the item into its domestic network, where it passes through several handling, sort- ing, and transport processes (event B). At the origin Office of Exchange, the item is assigned to a receptacle for international dispatch to the

|  |  |
| --- | --- |
| **Message ID** | **Event description** |
| *Exporting events* | |
| A | Posting/collection |
| B | Arrival at outwards office of exchange |
| C | Departure from outward office of exchange |
| *Importing events* | |
| D | Arrival at inward office of exchange |
| E | Held by import customs |
| F | Departure from inward office of exchange |
| G | Arrival at delivery office |
| H | Attempted/unsuccessful delivery |
| I | Final delivery |
| J | Arrival at transit office of exchange |
| K | Departure from transit office of exchange |

destination Office of Exchange, in which it departs from the country-of-origin (event C). After a few potential transiting events (events J–K), the item arrives at the destination (event D), where it is unloaded and handed over to the destination post. Event E describes the process of separating different items from the bundle (receptacle) that they were shipped in, retrieving the items, and clearing them through customs. Finally, the destination Office of Exchange in- ducts it into their domestic network for process- ing and potential relocation to the delivery of- fice, from which a final delivery to the customer happens (event I). Unsuccessful deliveries are recorded using event H. The focus of the LPI has been on the performance at the destina- tion, making the delay between events D and H/I the primary key performance indicator as- sessing postal logistics, covering the quality of postal infrastructure and speed of delivery.3 The delivery events have also been found to have the most consistency and country coverage.

The dataset was constructed for the en-

tire calendar year of 2019. The sample com- prised countries with more than 100 inbound unique parcel shipments; this included 132 countries from all World Bank regions and in- come groups. After data cleaning, 40 percent of

1. Beretzky and others 2022.
2. Boffa 2015.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| East Asia | Europe & | Latin America & | Middle East | North | South | Sub-Saharan |
| & Pacific | Central Asia | Caribbean | & North Africa | America | Asia | Africa |

low-income countries were represented in the postal dataset, 50 percent of Sub-Saharan Afri- can countries were represented, and Europe and Central Asia had a representation of 79 percent (figure A4.3).

Figure **A4.3 Country coverage of the Universal Postal Union dataset, by World Bank region**

Percent of countries in the region 80

60

40

20

0

*Source:* Universal Postal Union.

**TradeLens**

TradeLens was a highly secure data and docu- ment sharing platform aimed at simplifying and speeding trade workflows for all participants of the supply chain ecosystem. A collaboration between IBM and GTD Solution (a division of shipping conglomerate Maersk), the platform operated between 2018 and the first quarter of 2023. TradeLens used IBM Blockchain Plat- form, a permissioned blockchain system that offers immutability, privacy, and traceability of shipping documents. TradeLens brought together more than 1,000 major entities involved in the global supply chain, including more than 200 ports and terminals and more than 15 customs authorities, and by mid-2022, it was facilitating the information exchange of about 60 percent of containerized trade.4 Its interoperability was supported through the adaptation of a data model and access con- trol schema that were aligned with the Supply Chain Reference Data Model of the United

Nations Centre for Trade Facilitation and Elec- tronic Business (figure A4.4).

TradeLens used a simple, logical data model with three related classes: consignments, trans- port equipment, and shipments. The main purpose of this model was to track consign- ments, transport equipment (containers), and shipments while managing the identifiers and relationships between them. The platform al- lowed a consignment to be in multiple pieces of transport equipment, along with other consign- ments. It also allowed transport equipment to be part of multiple consignments.

The dataset extracted by TradeLens for the World Bank covers May 1–October 31, 2022. The sample contained timestamps for 11 events for four transport modes (ocean, road, barge, and rail) and two load statuses (full or empty), associated with more than 3 million unique tracked consignments and more than 30 million observations in total. The dataset covers more than 11,000 distinct United Na- tions Code for Trade and Transport Loca- tions (UNLOCODE), including destinations, origins, and live locations (locations of specific event timestamps). On average, about 9.8 events are associated with each consignment.

To create the key performance indica- tors, the World Bank team focused on time

1. See <https://www.tradelens.com/network>.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Vessel arrival | | Full container discharged from vessel | Customs release | Gate out of full container at import terminal | Gate-in of full container at inland location | Stripping completed in container inland location | Gate out of empty container from inland site | Gate-in of empty container at depot |
|  |  | | | | | | | |

differences or lead time between subsequent events. Events can happen between different lo- cations—for instance, on multimodal corridors or in shipping. Subsequent events may also occur at the same location, and the time that contain- ers stay at the same place is typically referred to as dwell time. Data processing consisted of split- ting container trips into a succession of transi- tions between subsequent events at the same or different locations. Key performance indicators were constructed by aggregating the lead time or dwell time for UNLOCODE or lead time be- tween pairs of UNLOCODE. To facilitate in- terpretation, the global container supply chain is



Figure **A4.4 TradeLens data model**

Events available Other events

BCO/NVO FFW/CHB/ Inland Customs/ Port/ Ocean Port/ Customs/ FFW/CHB/ Inland BCO/NVO 3PL transportation government terminals carriers terminals government 3PL transportation

authorities authorities

Shipping milestones and shipment data

Export phase

Transshipment phase

Import phase

*Source:* TradeLens.

broken into three phases: export on shore, ship- ping and transshipment, and import onshore (figure A4.5).

The tracking data cover the responsibility of international logistics operators, not that of shippers upstream or consignees downstream. Supply chain practices by the latter may vary. But container data include information on the movement of empty containers, which proxies the time taken to stuff export containers or de- liver full import containers at the destination. Information on repositioning and return of empty containers may lead to more meaningful indicators in the future.

Figure **A4.5 The three phases of container trips**

**Depot origin**

**Origin multimodal**

**Port export**

**Phase 1**

**Export on shore**

Dwell time

**Multimodal facility**

Dwell time

Dwell time

Laden containers

Empty

**Port transshipment**

**Phase 2 Maritime**

Transsipment time

**Port import**

**Return Phase 3**

**depot Import on shore**

Dwell time

**Multimodal facility**

Dwell time

**Destination**

Dwell time

*Source:* 2023 LPI team.

**MarineTraffic**

The port call dataset from MarineTraffic is a col- lection of records, processed from Automatic Identification System messages and enriched with proprietary information on ports and ship datasets sourced from the International Maritime Organization registry. Ship types ranging from small feeders with capacity up to 1,000 twenty- foot equivalent units to ultra large container vessels with capacity starting at 14,501 twenty- foot equivalent units. The information available includes timestamps of port arrivals and depar- tures reported through Automatic Identification System signals via terrestrial and satellite receivers.

Figure **A4.6 Country coverage of the MDS Transmodal and MarineTraffic dataset, by World Bank region**

Percent of countries in the region 80

60

40

20

0

*Source:* World Bank calculations based on data from MDS Transmodal and MarineTraffic.

The dataset was prepared using Marine- Traffic data on port calls that covered more than 5,000 container ships calling at more than 800 ports worldwide during the first two quarters of 2022. Based on estimated time differences be- tween recorded arrivals and departures to port facilities, an indicator of turnaround time per port was constructed.

The data from MDS Transmodal and Mari- neTraffic cover 52 percent of World Bank mem- bers (figure A4.6). The United Nations Confer- ence on Trade and Development uses the same sources when producing the Liner Container Shipping Connectivity Index and its own indi- cator of turnaround time.5

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| East Asia | Europe & | Latin America & | Middle East | North | South | Sub-Saharan |
| & Pacific | Central Asia | Caribbean | & North Africa | America | Asia | Africa |

1. UNCTAD 2021b.

**List of key performance indicators derived from tracking data**

Table **A4.2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Source** | **Indicator** | **Definition** | **Period** | **Why it matters** |
| MDS Transmodal | Number of services | Total number of maritime services (operated through liner shipping companies on a predefined rotation) between the two countries. | Second quarter of 2022 | Availability of services and frequency of connection. |
| Number of alliances | Count of the number of alliances per destination country. | Second quarter of 2022 | Competition between services. |
| Number of partners (countries) | Count of distinct number of country partners per destination country. | Second quarter of 2022 | Shipping connectivity metric. |
| Cargo iQ | Number of partners (countries) | Average number of partner countries | First and second quarters of 2022 | Air cargo connectivity metric. |
|  | Aviation dwell time (days) | Time difference between notification of readiness for delivery of cargo and cargo delivered to consignee at destination country. Median and quartiles are provided. | First and second quarters of 2022 | Efficiency of handling and clearance and notification to consignee. |
| Universal Postal Union | Number of partners (countries) | Average number of country partners. | 2019 | Postal connectivity. |
| Postal delivery time (days) | Median time difference between arrival at inward office of exchange and unsuccessful delivery or final delivery to recipient at the destination country. Median and quartiles are provided. | 2019 | Efficiency of clearance and postal logistics at destination. |
| TradeLens | Import and export dwell time (days) | Time spent at the same location (as defined by United Nations Code for Trade and Transport Locations) since expedition and before ship loading. Two variables are produced for each country: dwell time at port of departure and consolidated dwell time (including time spent at intermediate locations). Mean, median, and quartiles are provided.  The statistics are based on all container trips originating in the country, irrespective of the export and import corridor. | May 1 to  October 31, 2022 | Critical indicator resulting from many factors, including goods clearance, removal, and land services and to some extent terminal and multimodal performance. Export dwell time is representative of domestic logistics. |
|  | Corridors import lead time (days) | Estimation of mean time to import for corridors serving landlocked countries based on lead time between destination and port of import. | May 1 to  October 31, 2022 | Representative of road or rail corridor performance excluding multimodal transfer en route which are included in dwell time. |
|  | Export container lead time (days) | Sum of consolidated dwell time and corridor time for export and stuffing time. | May 1 to  October 31, 2022 | Same concept for exports. |
| MarineTraffic | Turnaround time (days) | Time difference between first instance of arrival and last instance of departure for consecutive repeated port visits (if any) calculated for each port call (as defined by United Nations Code for Trade and Transport Locations). Aggregated directly from port call time differences to countries over six months. This indicator excludes waiting time at anchorage. | First and second quarters of 2022 | Proxy of the performance of the ship to shore interface (including handling by the terminal operator). |

*Source:* World Bank.

# 5 The LPI methodology

**APPENDIX**

Because logistics has many dimensions, mea- suring and summarizing performance across countries are challenging. Examining the time and costs associated with logistics processes— port processing, customs clearance, transport, and the like—is a good start, and in many cases this information is readily available. But even when complete, this information cannot be easily aggregated into a single, consistent, cross-country dataset, because of structural dif- ferences in countries’ supply chains. Even more important, many critical elements of good logistics—such as process transparency and service quality, predictability, and reliability— cannot be assessed using only time and cost information.

**Methodology for selecting country groups for survey respondents**

*Source:* 2023 LPI team.

Table A**5.1**

**Constructing the international LPI**

The main part of the Logistics Performance Index (LPI) survey (questions 4 to 9 in the 2023 edition) provides the raw data for the interna- tional LPI. Each survey respondent rates up to eight overseas markets on six core components of logistics performance. The eight countries are chosen based on the most important export and import markets of the country where the respon- dent is located, on random selection, and—for landlocked countries—on neighboring coun- tries that form part of the land bridge connect- ing them with international markets (table A5.1). Respondents take the survey online. The sur-

vey for this edition was open from September 6

|  |  |  |  |
| --- | --- | --- | --- |
|  | **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 random countries, one from each country group:   1. Africa 2. East Asia and Central Asia 3. Latin America 4. Europe less Central Asia and OECD | Two random countries from a list of the five most important export partner countries and five most important import partner countries  +  Four random countries, one from each country group:   1. Africa 2. East Asia and Central Asia 3. Latin America 4. Europe less Central Asia and OECD   +  Two random countries from the combined country groups a, b, c, and d |
| **Respondents from landlocked countries** | Four most important export partner countries  +  Two most important import partner countries  +  Two land-bridge countries | Three most important export partner countries  +  One most important import partner country  +  Two land-bridge countries  +  Two countries randomly, one from each country group:   1. Africa, East Asia and Central Asia, and Latin America 2. Europe less Central Asia and OECD |

to November 5, 2022. The web engine for the survey underlying the 2023 LPI was the same as the engine put in place in 2012 (and used in subsequent editions). It incorporates the uni- form sampling randomized approach to gain the most possible responses from underrepresented countries. Because the survey engine relies on a specialized country selection methodology for survey respondents based on high trade vol- ume between countries, the uniform sampling randomized approach can help countries with lower trade volumes rise to the top during coun- try selection.

The survey engine builds a set of eight coun- tries for the survey respondents (see table A5.1). After 200 surveys, the uniform sampling ran- domized approach is introduced into the en- gine’s process for country selection. For each new survey respondent, the approach solicits a response from a country chosen at random but with nonuniform probability—with weights chosen to evolve the sampling toward uniform probability. Specifically, a country *i* is chosen with a probability (*N*–*ni*) / 2*N*, where *ni* is the

sample size of country *i* so far, and *N* is the total

sample size. As country sample sizes grew above 100, the country selection engine excluded oversampled countries from the pool to increase responses from underrepresented countries.

The international LPI is a summary indica- tor of logistics sector performance, combining data on six core performance components into a single aggregate measure. Some respondents did not provide information for all six components, so interpolation was used to fill in missing val- ues. The missing values were replaced with the country mean response for each question, ad- justed by the respondent’s average deviation from the country mean in the answered questions.

**Results of principal component analysis for the 2023 international LPI score**

*Source:* 2023 LPI team.

*Note:* na is not applicable.

Table A**5.2**

The six core components are:

* The efficiency of customs and border man- agement clearance, rated from very low (1) to very high (5) in survey question 4.
* The quality of trade and transport infra-

structure, rated from very low (1) to very high (5) in survey question 5.

* The ease of arranging competitively priced

shipments, rated from very difficult (1) to very easy (5) in survey question 6.

* The competence and quality of logistics services, rated from very low (1) to very high

(5) in survey question 7.

* The ability to track and trace consignments, rated from very low (1) to very high (5) in survey question 8.
* The frequency with which shipments reach

consignees within scheduled or expected delivery times, rated from hardly ever (1) to nearly always (5) in survey question 9.

The overall LPI score is constructed from these six indicators using principal component analysis, a standard statistical technique used to reduce the dimensionality of a dataset. In the LPI, the inputs for principal component analysis are country scores on questions 4–9, averaged across all respondents providing data on a given overseas market. Scores are normalized by sub- tracting the sample mean and dividing by the standard deviation before conducting the prin- cipal component analysis. The output from the analysis is a single indicator—the LPI score— which is a weighted average of those scores. The weights are chosen to maximize the percentage of variation in the LPI’s original six indicators that is accounted for by the summary indicator. The first (principal) eigenvalue of the cor- relation matrix of the six core indicators is greater than 1—and much larger than any other eigenvalue (see the first line of table A5.2). Stan- dard statistical tests, such as the Kaiser Crite- rion and the eigenvalue scree plot, suggest that a single principal component be retained to summarize the underlying data. This principal component is the international LPI score. The international LPI accounts for 91 percent of the

variation in the six components.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Component** | **Eigenvalue** | **Difference** | **Proportion** | **Cumulative** |
| 1 | 5.47139 | 5.27856 | 0.9119 | 0.9119 |
| 2 | 0.192832 | 0.034632 | 0.0321 | 0.9440 |
| 3 | 0.1582 | 0.0797762 | 0.0264 | 0.9704 |
| 4 | 0.0784234 | 0.0263933 | 0.0131 | 0.9835 |
| 5 | 0.0520301 | 0.00490627 | 0.0087 | 0.9921 |
| 6 | 0.0471239 | na | 0.0079 | 1.0000 |

country’s 2023 LPI score exceeds the upper bound of its 2018 score.

**Component loadings for the 2023 international LPI score**

*Source:* 2023 LPI team.

*Note:* na is not applicable.

Table A**5.3**

|  |  |
| --- | --- |
| **Component** | **Weight** |
| Customs | 0.4105 |
| Infrastructure | 0.4133 |
| International shipments | 0.3931 |
| Logistics quality and competence | 0.4168 |
| Tracking and tracing | 0.4133 |
| Timeliness | 0.4021 |

To calculate the confidence interval, the standard error of LPI scores across all respon- dents is estimated for a country. The upper and lower bounds of the confidence interval are then

*t*(0.1, *N*–1)*S*

*LPI* ± ,



*N*

To construct the international LPI score, normalized scores for each of the six original indicators are multiplied by their component loadings (table A5.3) and then summed. The component loadings represent the weight given to each original indicator in constructing the international LPI score. Since the loadings are similar for all six, the international LPI score is close to a simple average of the indicators. Al- though principal component analysis is rerun for each version of the LPI, the weights remain steady from year to year. There is thus a high de- gree of comparability across LPI editions.

**Constructing the confidence intervals**

To account for the sampling error created by the LPI’s survey-based methodology, LPI scores are presented with approximate 80 percent confi- dence intervals. These intervals make it possible to provide upper and lower bounds for a coun- try’s LPI score. To determine whether a differ- ence between two scores is statistically signifi- cant, confidence intervals must be examined carefully. For example, a statistically significant improvement in a country’s performance should not be concluded unless the lower bound of the

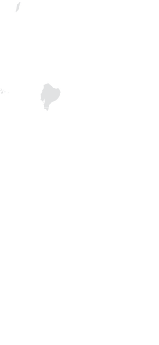
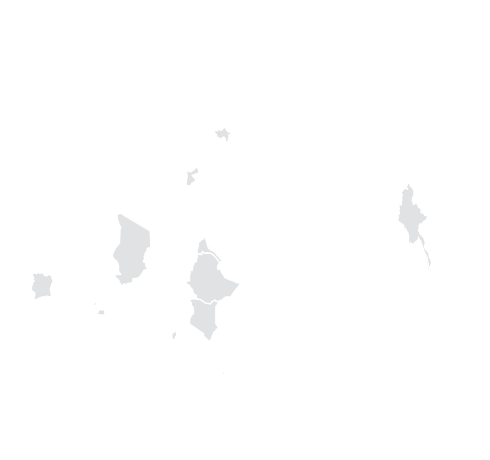
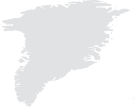
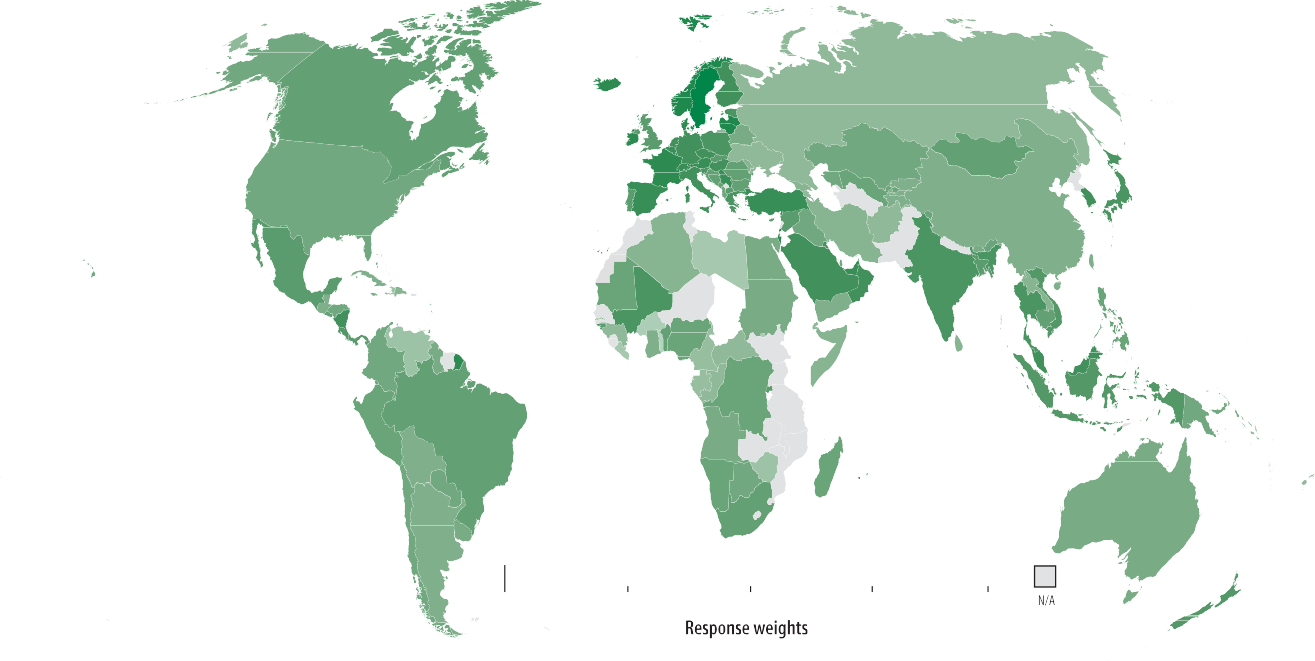
## where *LPI* is a country’s LPI score, *N* is the number of survey respondents for that coun- try, *s* is the estimated standard error of each country’s LPI score, and *t* is Student’s *t*-dis- tribution. As a result of this approach, confi- dence intervals and low-high ranges for scores are larger for small markets with few respon- dents, since these estimates are less certain. The average confidence interval on the 1–5 scale is 0.25, or about 8 percent of the average country’s LPI score. Hence, caution must be taken when interpreting small differences in LPI scores.

LPI scores have two limitations. First, the experience of international freight forwarders might not represent the broader logistics envi- ronment in poor countries, which often relies on traditional operators. And international and traditional operators might differ in their inter- actions with government agencies—and in their service levels. Second, for landlocked countries and small island states, the LPI might reflect ac- cess problems outside the country assessed, such as transit difficulties. The low rating of a land- locked country might not adequately reflect its trade facilitation efforts, which depend on the workings of complex international transit sys- tems. Landlocked countries cannot eliminate transit inefficiencies with domestic reforms.

# Results from the LPI survey question on demand for environmentally sustainable shipping options and on changes in global supply chains since 2019

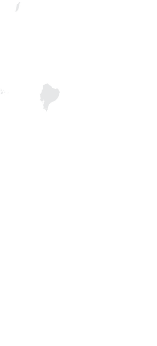
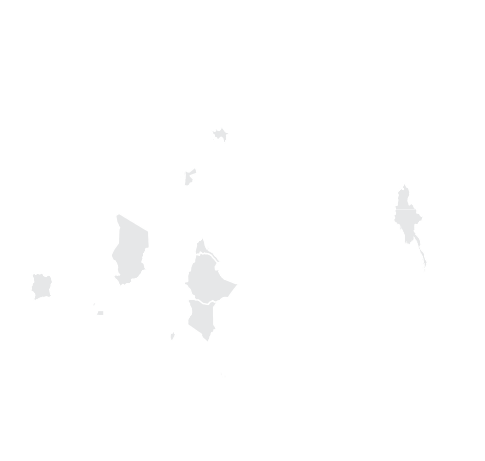
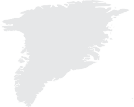
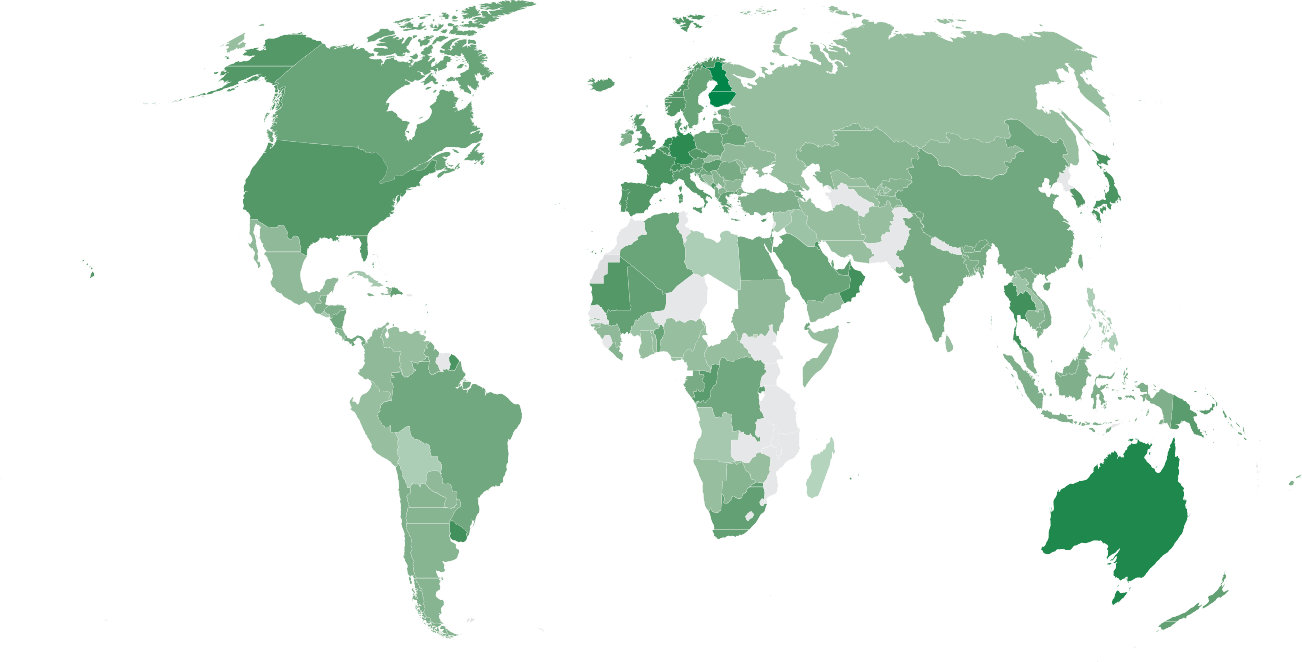
**APPENDIX**

**6**



Map **A6.1 How often do shippers ask for environmentally friendly options (e.g., in view of emission levels, choice of routes, vehicles, schedules, etc.) when shipping to…?**

*Source:* 2023 LPI team.



Map **A6.2 Based on your experience, how have supply chains been affected since the year 2019 when shipping to…?**

*Source:* 2023 LPI team.

**7 Respondent demographics**

**APPENDIX**

Operators on the ground are best placed to assess the vital aspects of logistics performance. The Logistics Performance Index (LPI) thus uses a structured online survey of logistics profes- sionals, multinational freight forwarders, and the main global express operators (for example, DHL, FedEx, and UPS). The 2023 LPI data are based on a survey conducted from September 6 to November 5, 2022, answered by 652 respondents. Among the respondents, 4 percent were in low-income countries, 39 percent were in lower- middle-income countries, 21 percent were in upper-middle-income countries, and 35 percent were in high-income countries (figure A7.1). These values are similar to those in previous LPI editions, except there are more respondents

from lower-middle-income countries.

About 38 percent of respondents identified their country of operations as Europe or Central

Asia, while others were dispersed among East Asia and Pacific (13 percent), South Asia (11 percent), and Sub-Saharan Africa (18 per- cent). The least represented regions are Latin America (9 percent of respondents), the Middle East and North Africa (9 percent), and North America (3 percent).

Among the respondents, 36 percent dealt with multimodal transport, 30 percent dealt with maritime transport, 17 percent dealt with road transport, and 12 percent dealt with air transport (figure A7.2). While these numbers are similar to those in 2018, the share of re- spondents dealing with road transport is higher than in previous years. In 2022, 57 percent of respondents were in freight forwarding, 12 per- cent worked with freight transport, 11 percent worked with customs brokerage, and 8 percent dealt with exports or imports.

Figure **A7.1 Number of respondents by location and country income group**

**By location**

**By country income group**

Middle East & North Africa 9%

Latin America & Caribbean 9%

North America 3%

Low income

4%

South Asia 11%

Europe & Central Asia 38%

Lower middle income 39%

High income 35%

East Asia &

Pacific Sub-Saharan

13%

Africa 18%

Upper middle income 21%

*Source:* 2023 LPI team.

Figure **A7.2 Respondents by transport mode and economic activity type**

**By transport mode**

**By economic activity type**

Express delivery 2%

Export/import (shipper)

8%

Rail 4%

Air transport 12%

Customs brokerage 11%

Multimodal 36%

Road 17%

Freight transport 12%

Freight forwarding 57%

Maritime 30%

Other 14%

*Source:* 2023 LPI team.

# LPI results in research and policymaking literature

**APPENDIX**

**8**

Since its launch in 2007, the Logistics Perfor- mance Index (LPI) has established itself as a global trade and transport facilitation indicator for policymakers, academics, logistics practitio- ners, consultants, and traders. It is also used by several advocacy groups, such as logistics sector industry associations. More than 1,000 research publications have used LPI data since 2007 (fig- ure A8.1). In addition, hundreds of policymaking reports have relied on LPI data. This excludes numerous textbooks, consultancy reports, and teaching materials and theses at various levels.

The LPI has also been used as a compo- nent in various transport and trade indicators, such as the World Economic Forum’s Enabling Trade Index, first published in 2008, and the EU Transport Scoreboard, launched in 2014. Practically all multilateral agencies, including the African Development, the Asian Develop- ment Bank, and the Inter-American Develop- ment Bank, as well as the United Nations Con- ference on Trade and Development, the United Nations Economic Commission for Europe, and the United Nations Economic and Social Commission for Asia and the Pacific, have ad- opted the LPI as a standard element in their trade- and transport-related publications.

LPI indicators are typically cited in research or policy literature that falls roughly evenly into two categories: trade economics or trade and transport facilitation and supply chain man- agement, transport, and logistics competitive- ness issues.

The division between the two categories is not clear cut. However, they indicate that the LPI is widely used for both trade facilitation and policymaking, typically at the macro level (the first category), and for more business-ori- ented purposes, often at the micro or supply chain level (the second category).

Figure **A8.1 Use of LPI data in research literature, 2007–22**

Number of journal articles and reports 1,000

800

600

400

200

0

2007 2010

2015

2020 2022

*Source:* Google Scholar.

In about 20 percent of citations, LPI data are the main empirical evidence, and in about 30 percent, LPI data are used as a major refer- ence. In the remaining 50 percent, LPI data are used as a minor reference. A nonexhaustive list of literature using the LPI since 2018, based on a literature search in ResearchGate in November 2022, is below.

**Selected research articles using the LPI since 2018**

The following is a nonexhaustive list of litera- ture using the LPI since 2018, based on a litera- ture search in ResearchGate in November 2022.

Abdalla, S. S. A., and K. Nakagawa. 2022. “Entrepreneurial Leadership, Supply Chain Innovation, and Adaptability: A Cross-national Investigation.” *Operations Research Forum* 3 (1): 23.

Abdulahi, E., and L. Fan. 2020. “Literature Review of Multimodal Transportation Risk Management System. Epitome.” *International Journal of Multidisciplinary Research* 4 (11): 119–127.

Acar, M. F., and A. Özer Torgalöz. 2022. “Measuring Foreign Trade- Logistics Efficiency: A DEA Approach and the Malmquist Index.” *New Perspectives in Operations Research and Management Science* 69–88.

Akbari, M., H. M. Nguyen, R. McClelland, and K. van Houdt. 2022. “Design, Implementation and Academic Perspectives on Authentic Assessment for Applied Business Higher Education in a Top Performing Asian Economy.” *Education + Training* 64 (1): 69–88.

Akdamar, E. 2022. “The Effect of Human Development on the Logistics Efficiency of the Countries.” *Mehmet Akif Ersoy Üniversitesi Iktisadi ve Idari Bilimler Fakültesi Dergisi* 9 (2): 871–896.

Alim, M., and S. E. Kesen. 2020. “Smart Warehouses in Logistics 4.0.” In

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Almalki, M., and M. Alkahtani. 2022. “Allocation of Regional Logistics Hubs and Assessing Their Contribution to Saudi Arabia’s Logistics Performance Index Ranking.” *Sustainability* 14 (12): 7474.

Alnıpak, S., E. Isikli, and S. Apak. 2021. “The Propellants of The Logistics Performance Index: An Empirical Panel Investigation of The European Region.” *International Journal of Logistics Research and Applications*, 1–23.

Ambashi, M., S. Buban, H. Phoumin, and R. Shrestha. 2020. *Subregional Development Strategy in ASEAN after COVID-19: Inclusiveness and Sustainability in the Mekong Subregion*. Economic Research Institute for ASEAN and East Asia.

An, H., A. Razzaq, A. Nawaz, S. M. Noman, and S. A. R. Khan. 2021. “Nexus Between Green Logistic Operations and Triple Bottom Line: Evidence from Infrastructure-Led Chinese Outward foreign Direct Investment in Belt and Road Host Countries.” *Environmental Science and Pollution Research* 28 (37): 51022–51045.

Ariansyah, K., E. R. E. Sirait, B. A. Nugroho, and M. Suryanegara.

2021. “Drivers of and Barriers to E-Commerce Adoption in Indonesia: Individuals’ Perspectives and the Implications.” *Telecommunications Policy* 45 (8): 102219.

Atalan, A. 2020. “Logistics Performance Index of OECD Members.”

*Akademik Arastırmalar ve Çalısmalar Dergisi (AKAD)* 12 (23): 608–619.

Atayah, O. F., M. M. Dhiaf, K. Najaf, and G. F. Frederico. 2022. “Impact of COVID-19 on Financial Performance of Logistics Firms: Evidence from G-20 Countries.” *Journal of Global Operations and Strategic Sourcing* 15 (2): 172–196.

Awaworyi Churchill, S., K. T. Baako, K. Mintah, and Q. Zhang. 2021. “Transport Infrastructure and House Prices in the Long Run.” *Transport Policy* 112: 1–12.

Azhari, B., and T. Taufik. 2021. *Strategy Formulation of Smart Logistics Development in a National Logistics Company.* The 3rd International Conference on Management of Technology, Innovation, and Project (MOTIP 03).

Banomyong, R., D. B. Grant, P. Varadejsatitwong, and P. Julagasigorn.

2022. “Developing and Validating a National Logistics Cost in Thailand.” *Transport Policy* 124: 5–19.

Bardal, A., and M. Sigitova. 2020. “Logistics Centres in The Region: The Russian Far East.” *IOP Conference Series: Materials Science and Engineering* 918 (1): 012035.

Beysenbaev, R., and Y. Dus. 2020. “Russia’s National Logistics System: Main Directions of Development.” *Logforum* 16 (2): 209–218.

Beysenbaev, R., and Y. Dus. 2020. “Proposals for Improving the Logistics Performance Index.” *The Asian Journal of Shipping and Logistics* 36

(1): 34–42.

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**What is the Logistics Performance Index?**

The LPI is an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance. The LPI is based on two components: First, a worldwide survey of international logistics operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics “friendliness” of the countries with which they trade. The International LPI 2023 allows for comparisons across 139 countries.

Second, this edition introduces indicators derived from global tracking datasets. They measure speed and delays for container, postal and air freight activities. They complement the main indicator but do not enter its score. Hence logistics performance is measured from two different perspectives: one based on the perceptions of international logistics professionals assessing their partner countries, the other one measuring the actual speed of global trade by using supply chain tracking information.

This is the seventh edition of Connecting to Compete, a report summarizing the findings from the new dataset for the Logistics Performance Index (LPI) and its component indicators. The 2023 LPI encapsulates the firsthand knowledge of movers of international trade and evidence from supply chain tracking data. This information is relevant for policymakers and the private sector seeking to identify reform priorities for trade and logistics infrastructure. Findings include:



* Notwithstanding the pandemic-induced disruptions to shipping and the global supply chain crisis, average overall scores in the LPI 2023 were roughly the same as in the last survey in 2018.
* The new indicators point to widespread differences in delays and supply chain reliability across the World. Several countries experience much larger delays than advanced and emerging economies. Binding constraints for low performances may be traced to infrastructure, productivity, or clearance procedures.



* The survey confirms growing demand for green logistics options, which lessen the carbon footprint of supply chains and keep trade moving.